

The impact of fintech on the financing constraints of SMEs

Luo Junnan

*School of Economics and Management, Guangxi Normal University, Guilin, China
15677097973@163.com*

Abstract: *With the rapid rise of fintech, the financing of small and medium-sized enterprises is facing profound changes. This paper reviews the literature on the impact of fintech on the financing constraints of small and medium-sized enterprises. In the traditional financial system, SMEs often face problems such as information asymmetry, high financing costs and limited access to finance. However, with the introduction of fintech, financing efficiency has been improved, costs have been reduced, and access to financing has become wider. Intelligent technology and data-driven risk assessment also provide SMEs with more accurate and real-time financing support. That said, some potential challenges have also been pointed out in the literature, including increasing information security and the digital divide. This review aims to provide a foundation for further research to more fully understand the role of fintech in SME finance, while providing practical guidance to relevant stakeholders.*

Keywords: *Fintechs; financing; constraints SMEs*

1. Introduction

In the contemporary rapidly evolving financial environment, the role of small and medium-sized enterprises has become increasingly prominent, and they have been identified as the key force driving economic growth and innovation. However, this segment has been limited in terms of access to finance, which has limited its ability to realize its full potential. With the rise of fintech, we are ushering in an era of unprecedented opportunities and change in SME financing. This article aims to explore the impact of fintech on SMEs' financing constraints, focusing on innovative technologies that address the problems of the traditional financial system and examining how these technologies can provide a more flexible, efficient and inclusive financing environment for SMEs.

Small and medium-sized enterprises (SMEs), as a vital part of the economic ecosystem, have made significant contributions to innovation, employment and social development. However, due to their relatively small size, information asymmetry and limited financing channels, these enterprises often face financing difficulties in the traditional financial system. The rise of fintech has injected new vitality into this sector, creating more flexible, efficient and innovative financing channels for small and medium-sized enterprises. This introduction will provide a comprehensive understanding of the impact of fintech on SME financing through a review of academic literature, aiming to provide a profound theoretical foundation and practical guidance for future research and practice. In this new financial era, we will explore how to maximize the use of fintech to help SMEs overcome financing barriers and achieve sustainable development.

2. Relevant research on fintech development

2.1. Definition of fintech

Fintech was first mentioned by Citibank in the "Financial Services Technology Alliance" project in the 1990s. In 2011, the term Fintech was officially put forward as financial technology. Fintech was first defined by the Financial Stability Board (FSB) in 2016, which believes that fintech can use cutting-edge technologies such as big data, cloud computing, blockchain and artificial intelligence to have a significant impact on the business model, technology application and products and services of the financial market and the financial industry. Since then, this definition has been used many times in the world. Although there is no official definition in China, the FinTech Development Plan (2019-2021)

released by the People's Bank of China in 2019 points out that fintech is a technological innovation from the perspective of finance. From the perspective of credit, Yi Xianrong et al. (2019) believed that the essence of fintech is to price credit and reduce credit risks through science and technology; From the perspective of technology, Ba Shusong et al. (2016) proposed that fintech is the use of high and new technology to empower finance and improve the operation efficiency of financial markets [1]; Therefore, the essence of fintech is financial innovation with deep integration of technology and finance.

2.2. Research on the development of fintech

In the field of finance, technology has been applied since the birth of finance. Agarwal (2020) focused on the nature of fintech, pointing out that fintech is a revolutionary technology centering on the activities of currency issuance, circulation, payment, settlement, investment and financing [2]. However, Emilio et al. (2020) divided the phased development of fintech and believed that the period from 1866 to 1967 was the first stage. The main feature of this stage was that the popularization of electric wires promoted the globalization of the financial industry; The period from 1967 to 2008 was the second stage. The main feature of this stage was that the development of network and the application of digital equipment greatly improved the informatization level of the financial industry. The third stage is from 2008 to now, and the main feature of this stage is that the application of cloud computing, big data, artificial intelligence and other high and new technologies has effectively promoted the innovation and development of financial industry [3]. Similarly, Ryu (2020) emphasized that electronization, informatization and technology are the three stages of the current development of financial technology [4].

It is widely recognized that the first stage of China's fintech development was from 1970 to 2008, which was mainly reflected in the exploration of informatization by the traditional financial industry. During this stage, China's financial industry mainly used computers to centrally process business, and tried to use data to assist business decision-making. In the second stage, from 2008 to 2011, Internet finance changed the business model of the traditional financial industry. In this stage, China mainly used the "Internet + strategy" form, combined with its own platform and user resources advantages, innovative online lending platform, online payment, equity crowdfunding and other business models. In the third stage, from 2011 to the present, the concept of Fintech was formally put forward in 2011, and gradually evolved into an important driving force leading the reform of China's financial system.

2.3. Fintech index measurement

There are two main types of fintech index measurement: stock price index measurement method and index construction method. The first type is the "index synthesis method". Many scholars use financial inclusion index or related economic indicators to measure fintech indicators. For example, Yang Wang and Wang Shuyu (2019) used the evaluation index of domestic fintech leaders and enterprises to construct the core index variable [5]. The second type uses the "text data mining method" to crawl the relevant data on the Internet platform and synthesize the fintech index. Shen and Guo (2015) used factor analysis method to crawl the words related to or similar concepts of Internet finance and calculate the occurrence time and frequency, thus generating the domestic Internet finance index [6]. Sun Tao (2018) aggregated the keywords related to fintech, word search trend index and media index from five dimensions, including resource allocation and technology foundation, to build the original lexicon, and used principal component analysis to synthesize the data obtained through text mining to construct the fintech index [7].

3. Research on financing constraints of small and medium-sized enterprises

3.1. Reasons for financing constraints of small and medium-sized enterprises

From the perspective of small and medium-sized enterprises' own development stage. Most of the research on the causes of small and medium-sized enterprises (SMEs) and their financial institutions shows that the phenomenon of small business financing is the result of a combination of factors, which has been proved by scholars at home and abroad. The majority of research on the causes of the great effect on small and medium enterprises (SMEs) is focused on their own situation and the level of financial institutions. Small and medium-sized enterprises are in the establishment and growth stage, due to the objective rules of financing structure and their own development reasons, it is difficult to get

the favor of financial institutions, that is, facing financial constraints; Domestic scholars Xia Liming et al. (2011), Yu Haijing and Kang Canhua (2017) all believed that SMEs have problems such as short operation period, lack of credit record and mortgage guarantee, which will hinder SMEs from obtaining financing from the financial market [8][9]. In addition, Liu (2013) believed that the core problem of financing difficulties for small and medium-sized enterprises is information asymmetry, so it is necessary to start from the systemic and institutional contradictions and establish a financial system and long-term mechanism to adapt to them.

From the perspective of financial institutions, financial structure represents the proportion and composition of various systems in the financial system. In each stage of economic development, the financial structure needs to match the demand of the real economy for financial services. Yao Yaojun and Dong Ganfeng (2015) believed that if the financial structure has the problem of matching degree in the process of economic development, even if the total amount of finance increases, it still cannot promote the economic development of small and medium-sized enterprises [10]. Most of the existing research focuses on the impact of banking financial institutions on the financing constraints of small and medium-sized enterprises. At present, China's financial structure is still dominated by the four major banks, and the number of small and medium-sized financial institutions is very small compared with the financing needs of the large number of micro, small and medium-sized enterprises (Zhou and Zhang, 2012). Lin Yifu (2009), a Chinese scholar, believed that China's financial structure is an indirect financing market dominated by large and medium-sized state-owned banks, which aggravates the impact of financing constraints on small and medium-sized enterprises [11]; At the same time, it also leads to the waste of financial resources and low efficiency (Lu and Yao, 2004). [12] The monopoly of banking financial institutions makes it more difficult for small and medium-sized enterprises to obtain credit funds that can meet their development. The monopoly operation of large banks makes them less concerned about the credit needs of small and medium-sized enterprises. Petersen and Rajan (2002) had the opposite idea, believing that the degree of monopoly in the credit market has a negative impact on the financing constraints of small and medium-sized enterprises, because monopolistic banks can better obtain information, tap potential small and medium-sized enterprises, and provide loans in order to obtain profits [13].

3.2. Research on the alleviation of financing constraints of small and medium-sized enterprises

From the perspective of industry, some scholars have studied whether supply chain finance and industrial agglomeration can also play a role. Supply chain finance is an innovative financial product, which can effectively improve the pain points of insufficient traditional collateral and high financing access threshold through the development of movable property pledge, notes receivable or accounts receivable financing (Jiang and Yao, 2016)[14]. At the same time, in recent years, non-financial enterprises have penetrated into the financial field through participation and holding, which is conducive to promoting supply chain enterprises to obtain more financial resources support (Lin et al., 2015; Wan et al., 2015)[15][16]. In addition, industrial focus can effectively[17]reduce corporate financing constraints[18]. MAO (2015) pointed out that industrial focus can enhance the convertible capacity of enterprises' fixed assets, which is conducive to enterprises' access to the capital market, and thus put forward policy suggestions to local governments on the establishment of industrial clusters [19].

4. Research on the impact of fintech development on the financing constraints of small and medium-sized enterprises

4.1. Fintech alleviates information asymmetry

From the perspective of information asymmetry, Chenget al. (2014) pointed out that fintech can improve the speed and quality of information disclosure, thus alleviating the problem of information asymmetry between lenders, and thus alleviating the financing constraints of small and medium-sized enterprises; Wang Lihui (2017) believed that the development of fintech would affect the information asymmetry of both sides by affecting the financial model, so as to solve the financing constraints of small and medium-sized enterprises [20]; Hou and Song (2020) believed that fintech changed the traditional financial model through digital technology, guided financial resources to "move from the virtual to the real," and made the credit financing market more transparent and open, thus solving the problem of information asymmetry and playing an important role in solving the dilemma of enterprise innovation and R&D funds .

4.2. Fintech reduces the financing cost of small and medium-sized enterprises

From the perspective of financing costs, Gomber et al. (2018) pointed out that fintech can create more new services and products through big data, which reduces the cost of banks to acquire customers, thus reducing the cost of issuing loans; Heiskanen (2017) proposed that emerging digital technologies can accurately collect the financial information of small and medium-sized enterprises and improve their credit. Small and medium-sized enterprises with high credit are easy to obtain the trust of financial institutions, and traditional financial institutions can also pass the loan requirements of small and medium-sized enterprises through low cost consumption [21]; Su Qin and Wei Xing (2017) pointed out that fintech, with the help of digital technology platforms such as big data, breaks through the limitations of time and space and meets the financing needs of low-income people with relatively low financial service transaction costs [22].

4.3. Fintech increases financing channels for small and medium-sized enterprises

From the perspective of financing channels, Cole et al. (2019) pointed out that fintech, as an alternative financing method, can provide more convenient financing channels through lower costs, thus increasing the possibility for small and medium-sized enterprises to obtain financing; Chiu and Koepl (2019) found that from the perspective of direct financing, fintech helps to promote the effect of direct financing on solving the financing constraints of small and medium-sized enterprises by improving the financing increment and financing quality in the capital market; PI and Liu et al. (2018) pointed out that in terms of indirect financing channels, fintech provides some help to effectively unblock financing channels through digital technologies such as big data and artificial intelligence; Zhang (2020) found that fintech can improve financing channels by studying the balanced relationship between the development of fintech and the scale, trading volume and turnover of financing channels [23].

5. Research suggestions

5.1. In-depth application and research promotion of fintech

In terms of in-depth application and research promotion of fintech, it is recommended that financial institutions and policy makers pay more attention to the key role of fintech in improving the financing environment of small and medium-sized enterprises (SMEs). In particular, in-depth research and extensive application of innovative technologies such as big data, artificial intelligence (AI) and blockchain can significantly improve financing efficiency and reduce costs. Big data can help financial institutions more accurately assess the credit status of SMEs by analyzing historical transaction data and market behavior. Artificial intelligence can automate the loan approval process, improve approval efficiency and reduce labor costs. Blockchain technology has advantages in ensuring transaction transparency and security, and can be effectively applied in areas such as supply chain finance and smart contracts. Policymakers should support the development of these technologies by providing incentives such as research and development funding, tax credits, and regulatory frameworks to protect innovation and consumer rights. Cooperation between financial institutions and technology enterprises, financial products and services tailored to the needs of SMEs, and training employees in new technologies will further improve the quality and efficiency of services. These measures will accelerate the innovation and popularization of fintech to boost SMEs. It will provide more efficient and low-cost financing services to promote stable economic growth and healthy development.

5.2. Strengthen regulation in the fintech sector

Strengthening regulation in the fintech sector, especially in terms of data security and privacy protection, is essential to ensure that financial services are digitized and networked securely. With the massive concentration of sensitive personal and corporate information in financial institutions and technology companies, the risk of data leakage and abuse has increased accordingly, exacerbating consumer concerns over privacy and asset security. Therefore, it is recommended that policy makers and regulators should formulate more stringent and comprehensive data protection regulations, including strengthening security standards for data processing and storage, and ensuring that fintech enterprises follow best practices to prevent data breaches and unauthorized access. At the same time, promote the establishment of transparency and accountability mechanisms, so that consumers have a clear understanding of how their data is collected, used and shared. Regulators will also need to regularly review fintechs to ensure their compliance. In addition, strengthening the protection of consumers' personal information and giving them more rights and choices regarding the handling of

their personal information is a must. Fintech companies should also take proactive measures to invest in advanced security technologies, enhance employees' awareness of data security, and establish an emergency response mechanism to deal with data breaches. These measures will enhance the credibility of the industry and increase consumer trust. And promote innovation in fintech while protecting privacy.

5.3. Promote the spread of digital capabilities

To promote the spread of digital capabilities, it is recommended that the government and industry associations take proactive measures to promote this process, especially among SMEs, to reduce the digital divide and ensure that all enterprises can benefit from the development of fintech. In practical terms, the government can encourage the adoption and application of digital technologies in the SME sector by providing policies such as financial subsidies, tax incentives and technical training support. At the same time, a special digital transformation fund should be established to support SMEs in technological upgrading and innovation. Industry associations, on the other hand, should play the role of a bridge to promote information exchange and resource sharing, and provide SMEs with the latest knowledge and practical cases related to fintech. In addition, cooperation with universities and research institutions should be strengthened to promote the research, development and application of digital technologies, especially for the actual needs of SMEs. The government and industry associations should also advocate the establishment of digital cooperation networks to encourage cooperation and experience exchange among small and medium-sized enterprises, and jointly improve the level of digitalization. Through these comprehensive measures, it can not only help small and medium-sized enterprises overcome the difficulties of digital transformation, but also stimulate the whole industry. Innovation promotes economy's overall healthy development.

5.4. Develop financial products that meet the needs of SMEs

To better serve SMEs, financial institutions should develop financial products and services that better meet the needs of these enterprises. Given the unique challenges SMEs face, such as limited collateral, volatile cash flows and smaller financing scales, financial products should be designed with greater flexibility and innovation in mind. For example, offering loan products with flexible repayment plans and lower interest rates, which can be adjusted according to the cash flow profile of SMEs, thus easing their financial stress. Individualized financing schemes, such as financing for specific projects or orders, can provide more precise financial support. At the same time, financial technologies, such as big data and artificial intelligence, can be leveraged to optimize the credit assessment process and provide fast and low-cost financing services for SMEs. Financial institutions should also strengthen cooperation with governments and industry associations to promote policies and environment conducive to SME financing, such as participating in government-guaranteed loan schemes or providing services for SMEs in specific industries and development stages. These measures not only help SMEs solve their financing problems, but also promote the health of the whole economy healthy development.

6. Conclusions

In the current context of booming fintech, the financing of small and medium-sized enterprises (SMEs) has attracted much attention. Based on the review of relevant academic literature, this paper investigates the impact of fintech on the financing constraints of small and medium-sized enterprises. First, we review the key role of SMEs in the economic system and highlight the substantive challenges of financing constraints in the traditional financial system, including information asymmetry, expensive financing costs and limited access to financing. We systematically review the involvement of fintech, and comprehensively discuss its positive role in improving financing efficiency, reducing costs, broadening financing channels and risk management. However, we also carefully examine the possible information security risks and widening of the digital divide caused by fintech. This literature review lays a deep theoretical foundation for future research, while providing practical and feasible guidance for SMEs, policy makers and financial practitioners.

Looking to the future, we expect that more in-depth research will focus on the evolution of fintech in the field of SME financing and pay close attention to the dynamic changes in technological innovation and regulatory environment. Further understanding of information security, privacy protection and digital inclusion in this rapidly changing field will be the focus of future research. We encourage interdisciplinary research to address the complex challenges faced by SMEs in the financing process with a more holistic perspective. By continuously deepening academic insights into fintech, we are better able to drive innovation in SME financing, thus providing support for their greater role in the

economy.

Acknowledgements

This paper is the research result of the 2023 Graduate Scientific Research Start-up Fund project of the School of Economics and Management of Guangxi Normal University. Project No.: JGYJSKY202312.

References

- [1] Ba, S., & Bai, H. (2016). *The development history and core technology application scenarios of financial technology*. *Tsinghua Financial Review*, (11), 99-103.
- [2] Agarwal, S., & Zhang, J. (2020). *FinTech, lending, and payment innovation: A review*. *Asia-Pacific Journal of Financial Studies*, 49(3).
- [3] Abad-Segura, E., González-Zamar, M.-D., López-Meneses, E., & Vázquez-Cano, E. (2020). *Financial technology: Review of trends, approaches, and management*. *Mathematics*, 8(6).
- [4] Ryu, H., & Ko, K. S. (2020). *Sustainable development of fintech: Focused on uncertainty and perceived quality issues*. *Sustainability*, 12(18).
- [5] Yang, W., & Wang, S. (2019). *Financial technology and commercial banks' risk-taking: Based on an empirical study of 135 commercial banks*. *Gansu Finance*, (04), 16-22.
- [6] Shen, Y., & Guo, P. (2015). *Internet finance, technology spillover, and the total factor productivity of commercial banks*. *Journal of Financial Research*, (03), 160-175.
- [7] Sun, T. (2019). *The impact of financial technology on China's financial development*. Hunan University.
- [8] Xia, L., Zong, H., & Meng, L. (2011). *Construction of a credit risk evaluation index system for SMEs: A study based on the perspective of supply chain finance*. *Financial Forum*, (10), 73-79.
- [9] Yu, H., & Kang, C. (2017). *Research on the financing mechanism of SMEs from the perspective of supply chain finance*. *Nankai Economic Studies*, (04), 141-152.
- [10] Yao, Y., & Dong, G. (2015). *The relief of financing constraints for SMEs: Is the level of financial development or financial structure more important? —Evidence from SMEs listed on the SME board*. *Journal of Financial Research*, 04, 148-161.
- [11] Lin, Y., Sun, X., & Jiang, Y. (2009). *A preliminary exploration of the optimal financial structure theory in economic development*. *Economic Research Journal*, (8), 4-17.
- [12] Lu, F., & Yao, Y. (2004). *Law, financial development, and economic growth under financial repression*. *Chinese Social Sciences*, (01), 42-55+206.
- [13] Petersen, M. A., & Rajan, R. G. (2002). *Does distance still matter? The information revolution in small business lending*. *The Journal of Finance*, 57, 2533-2570.
- [14] Jiang, W., & Yao, W. (2016). *The implementation of the Property Rights Law and supply chain finance: Evidence from accounts receivable pledge financing*. *Economic Research Journal*, 51(01), 141-154.
- [15] Lin, X., Lin, C., & Wang, X. (2015). *Supply chain finance: Revitalizing inventory, advancing the integration of industry and finance*. *Financial Markets Research*, (11), 57-66.
- [16] Wan, L., Liao, M., & Hu, J. (2015). *The integration of industry and finance and corporate financing constraints: Based on the empirical study of listed companies participating in banks*. *Nankai Management Review*, 18(02), 64-72+91.
- [17] Gabidei, O. (1994). *Trust, interlinking transactions, and credit in the industrial district*. *Cambridge Journal of Economics*, 18, 529-546.
- [18] Sheng, D., & Wang, Y. (2013). *Industrial agglomeration, the efficiency of credit resource allocation, and the financing constraints of enterprises: Evidence from World Bank survey data and data on Chinese industrial enterprises*. *Management World*, (6), 85-98.
- [19] Mao, R. (2015). *Industrial agglomeration and the financing constraints of enterprises*. *Management World*, (02), 58-71.
- [20] Wang, L. (2017). *An empirical analysis of financial technology and SME financing: From the perspective of game theory*. *Research on Technology Economics and Management*, (02), 93-97.
- [21] Heiskanen, A. (2017). *The technology of trust: How the Internet of Things and blockchain could usher in a new era of construction productivity*. *Construction Research and Innovation*, 8(2), 66-70.
- [22] Su, Q., & Wei, X. (2017). *The financial inclusion effect and innovation-driven path of financial technology*. *Theoretical Exploration*, (05), 91-97.
- [23] Zhang, Y. (2020). *Financial technology and SME financing*. *Quality & Market*, (06), 13-15.