Study on Financing Constraints of Small and Medium-sized Enterprises Eased by Financial Technology

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Abstract. Small and medium-sized enterprises (SMEs) are increasingly important for economic growth, employment opportunities, and innovation. However, the traditional financial system has failed to meet its diverse financing needs, especially in terms of information asymmetry and risk assessment. There is a lack of systematic theoretical analyses and empirical tests on how FinTech affects the financing constraints of SMEs. This paper explores in detail the role of information asymmetry, leverage, and financial sector concentration in the financing process of SMEs through an in-depth study of the mechanism of FinTech's impact on SMEs' financing constraints. The results of the study show that the development of FinTech has a significant effect on alleviating the financing constraints of SMEs. In addition, this study finds that FinTech is particularly effective in alleviating the financing constraints of SMEs in the eastern region. However, in the Western region, the financing difficulties faced by SMEs are still severe. Therefore, the state should vigorously promote the development of fintech, especially in the less developed regions in the West, with a view to reducing the imbalance between the East and West in terms of economic development, and thus promoting balanced development nationwide.

Keywords: Fintech; financing constraints; information asymmetry; concentration; leverage ratio.

1. Introduction

In recent years, small and medium-sized enterprises (SMEs) have played a pivotal role in driving sustained economic growth, creating abundant employment opportunities, and promoting innovative activities. However, these enterprises often face multiple challenges such as weak risk resistance, insufficiently transparent financial information, low credit ratings, and relatively single source of financing. This has led to difficulties in fully meeting their financing needs. This issue has triggered extensive attention and in-depth discussions between academia and the industry. In this context, financial technology (FinTech), with its unique advantages, provides practical solutions to the financing difficulties of SMEs, thus attracting much attention. FinTech can not only effectively alleviate the financing constraints of SMEs, but also open up broader financing channels and possibilities for them.

The development of FinTech is negatively correlated with the degree of financing constraints. Through the ACW (Almeida-Campello) model, the level of fintech development is measured by using enterprise cash flow. Lou believes that the development of fintech can alleviate the financing constraints of SMEs [1]. However, scholars still hold different opinions about the mechanism of fintech's effect on SMEs' financing constraints. Chen believes that fintech can enhance the match between the supply and demand of funds [2]. Zhang believes that cash flow sensitivity constrains the financing constraints of SMEs [3]. Chen believes that FinTech can alleviate the financing constraints of SMEs by alleviating the concentration and information asymmetry in the financial industry [4]. As mentioned above, FinTech can constrain the financing constraints of SMEs by affecting the degree of information asymmetry, the concentration of the financial industry, and the current leverage ratio of SMEs.

Because of the severe situation of financing difficulties of SMEs, this paper seeks to explore ways to solve the problem. By exploring the feasibility and development prospects of financial technology in the financing constraints, improving the recognition of SMEs for financial technology and

adaptability, helps the development of financial technology and promotes the easing of financing constraints of small and medium-sized enterprises.

2. Background of FinTech

Financial technology, referred to as FinTech, refers to the innovation of products and services provided by the traditional financial industry through the use of various types of technological means to improve efficiency and effectively reduce operating costs.

From the perspective of financial technology to promote financial change, the industry has divided the development of FinTech into three stages: the stage of financial informatisation, the stage of Internet finance, and the stage of deep integration of finance and technology.

2.1. Development Status

At present, fintech is in a stage of rapid development.

2.1.1. Global fintech development status

In 2022, the performance of the global FinTech market was steady and progressive. In terms of industry financing, the number of financings is at the second highest level in the past five years, although the financing scale fails to surpass that of 2021. Fig. 1 represents the development of the global FinTech market from 2019-2022. The horizontal coordinate represents the research data year 2019-2022; the vertical coordinate represents the total amount of financing in USD billion.

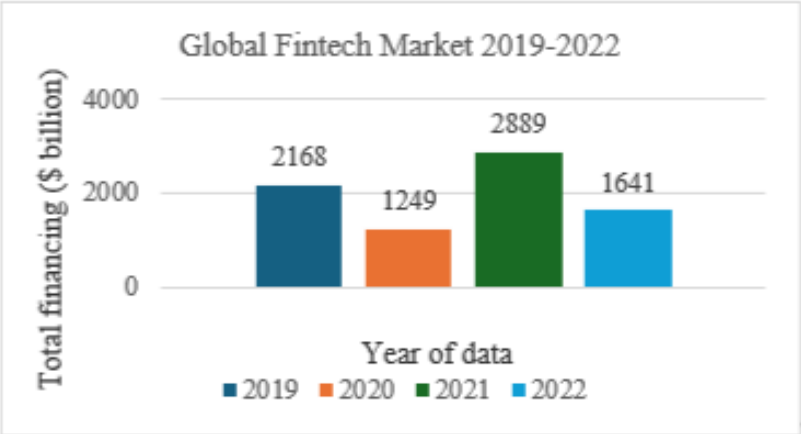

Fig. 1 Global fintech financing market [2].

2.1.2. Development status of China's fintech industry

In recent years, China's fintech market size maintained the growth trend, with a growth rate to maintain at about 10% 2022 fintech overall market size reached about 542.3 billion yuan [5].

China's fintech industry shows a developed city cluster effect, mainly distributed in the "Yangtze River Delta", "Pearl River Delta", and "Beijing-Tianjin-Hebei" three major city clusters. Among them, the number of applications from enterprises in major cities such as Beijing, Shanghai, Guangzhou, Shenzhen, and Hangzhou accounts for 82%. Meanwhile, the trend of geographical diversification of the industry is becoming more and more obvious, with Chengdu-Chongqing and the city cluster in the middle reaches of the Yangtze River emerging, and the number of the Top 100 enterprises continuing to grow, with an increase of 10 enterprises, or 20 percent, compared with 2021. Governments at all levels are paying more and more attention to fintech in industrial planning.

Fintech is a typical innovation-driven and intelligence-intensive industry. Investment in science and technology is a key factor in driving the industry's development. 2021-2022, the number of fintech companies with more than 50% investment in science and technology increased by 8%.2022 In April 2022, the Ministry of Finance (MOF), the State Administration of Taxation (SAT), and the Ministry of Science and Technology (MOST) jointly issued an "Announcement on Further Increasing

the Proportion of Pre-Tax Deduction for R&D Expenses of Science and Technology-Based Small and Medium-Sized Enterprises," proposing that the proportion of deduction for R&D expenses incurred by enterprises should be increased to 100 percent. The industry's investment in science and technology R&D is increasing under the guidance of national support policies [6].

2.2. Impact of Fintech Technology on SMEs

2.2.1. Electronic payment

Alfonz points out that e-payment plays an important role in SMEs, helping to improve business processes and enabling their integration into the digital business ecosystem. It not only helps SMEs to conduct cross-border transactions more conveniently and efficiently, but also broadens SMEs' business, reduces transaction costs, and enhances SMEs' competitiveness [7].

2.2.2. Blockchain technology

Blockchain technology has an indispensable role in improving the transparency, security, and efficiency of transactions, especially in the application of smart contracts, electronic payments, and identity verification.

Help for SMEs: Gong believes that the technology of blockchain: consensus mechanism zone and smart contract can ensure that the uploaded information is not tampered with and information is traceable, which is conducive to ensuring that the uploaded information of the borrowing and lending parties is true and reliable. Blockchain technology can help SMEs reduce transaction costs, improve data security, and automate the execution of contract terms through smart contracts, reducing the risk of disputes and fraud [8].

3. The Impact of Fintech on Financing Constraints

3.1. Leverage

At the enterprise level, the micro leverage ratio is defined as the gearing ratio, which is the ratio of total liabilities to total assets of an enterprise. Currently, financial scholars generally believe that FinTech has a dampening effect on the rise of corporate leverage. From an objective standpoint, corporate finance is predicated on the trade-off theory, which posits that in a perfectly competitive market, the capital structure of a firm will not affect its value. This implies that the firm's indebtedness and the size of its debt will not influence its value. However, after considering the tax shield of debt, the value of a leveraged firm is the value of an unleveraged firm plus the present value of the tax savings on interest. From a cost perspective, He Xiulian used the 2011-2020 Guangdong Province's manufacturing leverage level and financing data, respectively, from the total corporate debt and the distribution of the industry share of corporate debt to initiate the analysis [9]. The study found that the probability of enterprises increasing leverage by merely pursuing the benefits brought about by leverage is not high. Conversely, the study emphasized the importance of the cost of financial distress. When firms have high debt, they will be more sensitive to the cost of debt. The role of financial technology in the cost of financing and financing channels, among other things, makes the enterprise's financing constraints lower. This, in turn, allows the enterprise to obtain the funds needed for production, investment, and operation on time. Consequently, the cost of financial distress is reduced, resulting in surplus funds to repay existing debt, thereby decreasing the leverage level [9]. Scholar Lai et al. collected financial data of Chinese listed companies from 2007 to 2020 from the China Stock Market Accounting Research (CSMAR) database and the China Research Data Service (CNRDS) database [10]. The study employed a fixed effects model to analyze the effect of FinTech on corporate leverage. The findings revealed that FinTech can achieve this effect through three key avenues: reducing the excessive leverage level of enterprises, enhancing stock liquidity, and reducing information asymmetry. Scholar Dai obtained financial data of A-share listed firms from the China Stock Market and Accounting Research Database (CSMAR) database for the period 2015-2019. The study employs panel regression modeling to demonstrate that FinTech can reduce SMEs' leverage by

narrowing the information gap between supply and demand, enhancing financing channels, reducing financing costs, and rapidly establishing risk control [11].

Based on experimental and theoretical analysis, it can be concluded that the development of digital finance can significantly reduce the leverage of companies in various fields by influencing multiple factors.

3.2. Information Asymmetry

Information asymmetry (asymmetric information) refers to the unequal access to information possessed by different individuals in a transaction. In social, political, economic, and other activities, some members possess information that other members lack, thereby creating an information asymmetry. In market economic activities, individuals possess varying levels of information, which gives them different positions in the market. Those with more adequate information are often in a more favorable position, while those with poor information are in a more unfavorable position.

The primary reasons why small and medium-sized enterprises (SMEs) encounter difficulties in obtaining financing, particularly in terms of cost, are attributed to information asymmetry. This is due to several factors, including:

(1) Increased assessment difficulty: As a result of the lack of attention paid by SMEs to their credit assessment, higher business operation risks, the absence of effective guarantee collateral, inadequate financial systems, and the frequent changes in management personnel, banks find it challenging to accurately assess the operational and financial status of SMEs, which in turn leads to increased difficulty in credit risk assessment.

(2) The high risk of uncertainty is compounded by the frequent changes in management personnel and the unpredictable management styles of SMEs. These factors contribute to increased uncertainty in the loan process, prompting banks to increase their lending rates to mitigate the risk of default and loss.

(3) High cost of information review: To overcome the problem of information asymmetry, banks will increase their efforts in reviewing information and verifying the assets of SMEs when processing loans for enterprises, thus increasing transaction costs. These costs are often reflected in higher interest rates or stricter loan terms for SMEs.

(4) Imbalanced credit rationing: The increased risk due to information asymmetry may act as a deterrent for banks and other lending institutions from lending to SMEs, even when banks are well capitalized, or from lending only to enterprises with which they have a close relationship. Furthermore, the problem of high financing costs is further exacerbated by the fact that SMEs are required to pay higher financing costs, including providing more guarantees and warranties and accepting higher interest rates, to prove their creditworthiness and obtain funding.

(5) Low market trust: In comparison to large enterprises, large enterprises are more likely to possess robust internal management systems and transparent financial disclosure. Moreover, large enterprises are long-term partners with banks, with which they have established long-term, stable business relationships and low default risks. Regarding management quality, SMEs are typically less reputable than large enterprises, and their management's behavioral patterns and management styles are more unpredictable, which increases moral hazard in the credit process. Small and medium-sized enterprises (SMEs) tend to make relatively little information public and have low information transparency, which leads to a lack of trust in banks, which in turn affects their ability to obtain financing. The key to solving these problems lies in the use of fintech technology to reduce information asymmetry, improve the transparency of SMEs and the risk-assessment capabilities of credit institutions, as well as the innovation of financial products and services by banks to better meet the financing needs of SMEs.

3.3. Banking Concentration

Banking concentration, as an important indicator of competition within the banking sector, has attracted extensive academic attention in recent years. Several studies have demonstrated that

FinTech has had a profound impact on banking concentration. Through in-depth research, Jue Feng demonstrates that FinTech has significantly intensified competition in the banking industry by extending the lending distance between banks and enterprises and providing more diversified channels for corporate credit sources [12]. Jackson's research similarly indicates that FinTech has separated financial services and customer groups from traditional commercial banks, further intensifying the competitive situation in the banking industry [13]. In conclusion, the advancement of FinTech has intensified competition in the banking sector, consequently exerting a considerable influence on banking sector concentration.

There is a discernible correlation between banking sector concentration and the degree of financing constraints faced by SMEs. Currently, academics have not yet reached a unified viewpoint on the impact of banking sector concentration on financing constraints. Two distinct mainstream views exist the information hypothesis, which emphasises relationship lending, and the market power hypothesis based on the structure-behaviour-performance approach [14].

The market power hypothesis, which is accepted by the majority of scholars, posits that with less competition in the credit market, banks will restrict the supply of credit and set higher lending rates in order to make monopoly profits [15]. The hypothesis, which has been less studied among the current literature, posits that more intense competition may make it more challenging for banks to internalize the benefits of assisting opaque firms, which in turn leads to more credit constraints [16].

Several academic studies have been conducted by both domestic and international scholars based on the information hypothesis and the market power hypothesis. Habib Hussain Khan conducted an in-depth theoretical and empirical analysis of the market power hypothesis, along with a theoretical analysis of the information hypothesis, using 48 developing economies as the subject of his study. Empirical results indicate that firms may encounter greater obstacles to financing in environments with lower banking sector concentration. Terence employs a dataset from a stratified survey of private firms in China in 2006 to quantify the extent of financing constraints through financing gap ratios [14]. The empirical study found that, by the market power hypothesis, the lower the competition in the banking sector, the greater the probability of SMEs facing credit constraints, while the financing gap ratio increases accordingly [14]. Zhiwei Zhang conducted an empirical study based on the market power hypothesis with a sample of listed firms in 200 cities over the period 2000-2015 [17]. The studies analyzed both temporal and cross-sectional dimensions, concluding that an increase in the market share of state-owned commercial banks exacerbates the financing constraints of enterprises, while an increase in the market share of joint-stock and regional commercial banks eases the financing constraints of enterprises [17]. These studies provide a multidimensional perspective on the relationship between banking sector concentration and SME financing constraints.

4. Policy Recommendations

First, the construction of a multi-level and wide-coverage enterprise financial and non-financial information data system should be promoted to assist lenders in developing differentiated and personalized financial products. This will lower the threshold of financial services, prompting most enterprises to obtain financial services at a lower cost, more conveniently, and more efficiently [7].

Second, comprehensive government regulation suggests the establishment of a cross-market, cross-regional, and cross-sectoral regulatory mechanism for digital financial businesses during the process of comprehensive digital financial regulation. For new digital financial businesses with unclear application effects and risks, a certain observation period is granted based on mechanisms such as localized pilots. It is recommended that the development and promotion of the financial technology industry in different regions be encouraged in a manner that is consistent with the local industrial structure, to further stimulate the inclusion of financial technology in all regions of the country [18].

Third, it is proposed that the structural reform of the financial supply side be deepened and that the development of digital inclusive finance be continuously promoted. It is further recommended

that support be provided to financial services that rely more heavily on inclusive finance for small and medium-sized enterprises (SMEs).

5. Conclusion

This paper introduces how to use financial technology to alleviate the financing constraints of SMEs and its necessity, and discusses the reasons for the financing constraints of SMEs from three aspects: leverage ratio, information asymmetry, and bank concentration.

This paper concludes that in the future, fintech will continue to deeply affect traditional financial business, change the way financial services are provided, and improve settlement efficiency. At the same time, fintech will also facilitate the digital transformation of SMEs, enabling them to better integrate into the digital business ecosystem and enhance their competitiveness and sustainable development capabilities. The development of fintech is expected to put more emphasis on intelligent, personalized services, strengthen risk management and data security, and promote more open and innovative financial markets. The rapid development of financial technology (FinTech) has profoundly changed the process of traditional financial business, and the development of small and medium-sized enterprises (SMEs) has provided unprecedented convenience.

This pape provides solutions for small and medium-sized enterprises to solve financing problems. The continued high-quality development of fintech has brought many benefits to SMEs, including more convenient and diversified payment methods, low barriers to entry, low-interest rate financing channels, and a secure transaction environment. However, SMEs also need to seriously learn these new technologies and take full advantage of the opportunities brought by fintech. Use these technologies to improve their digital level, enhance their competitiveness, obtain more high-quality customers, expand financing channels, and reduce their financing costs.

There are also some limitations in this study, such as sample selection bias, small selection of factors, and changes in the policy environment. The literature reviewed in this paper has some limitations in sample selection and does not cover all small and medium-sized enterprises. This limitation may lead to a bias or insufficiency in the discussion of the financing constraints of SMEs in different development stages and industries, thus affecting the universality of the conclusions drawn in this paper. It is hoped that samples can be selected more comprehensively in the future to make the data in this paper more accurate and the conclusions more general.

This paper has limitations in the selection of influencing factors. When discussing the influencing factors of SMEs financing constraints, this paper mainly focuses on three aspects: leverage ratio, information asymmetry, and bank concentration. However, the financing problem of small and medium-sized enterprises is far from limited, and I hope that this paper can analyze more influential factors in the future to make this paper more authoritative. The research bias caused by the small selection of factors is reduced, so as to improve the research quality and practical value.

During the period under review, China's financial policy and regulatory environment have undergone significant changes that could have far-reaching implications for SME financing. As a result, these changes may weaken the rigor of the article. It is recommended to set up a monitoring mechanism to continuously track the impact of policy changes on SMEs and financial markets to adjust and optimize research directions and methods promptly.

Authors Contribution

All the authors contributed equally and their names were listed in alphabetical order.

References

[1] Lou Z, Xie Q, Shen J H, Lee C C. Does Supply Chain Finance (SCF) alleviate funding constraints of SMEs? Evidence from China. Research in International Business and Finance, 2024, 67(A): 102157.

[2] Siyu C. Impact of financial technology on financing constraints of small and medium-sized enterprises and countermeasure analysis. China Journal of Commerce, 2022 (05): 127-129.

[3] Mengdie Z. Research on the impact of Fintech on financing constraints of small and medium-sized enterprises: Based on the empirical test of NEEQ enterprises. Market Modernization, 2023(24): 153-155.

[4] Chen C, Xiao B, Wang J, Ye H. The effects of fintech development on financing constraints of small and medium-sized enterprises—Evidence from China. Managerial and Decision Economics, 2023, 44(7): 4161–4172.

[5] Xiaoqiang Y, Jiangpeng Z. Current situation and trend of fintech development in China. International Finance, 2024(01): 50-55.

[6] Alfonz L K, Bachtiar H S, Danang P P. The influence of e-payment and e-commerce services on supply chain performance: implications of open innovation and solutions for the digitalization of micro, small, and medium enterprises (MSMEs) in Indonesia. Journal of Open Innovation: Technology, Market, and Complexity, 2022, 119: 2199-8531.

[7] Qiang G, Mingyuan B, Yilin Z. Gong Q, Mingyuan B, Yilin Z. Blockchain, Enterprise digitization and Supply chain Finance Innovation. Journal of Management World, 2021, 37(2): 22-34.

[8] Xiuping H. Study on the influence of financial technology on the leverage ratio of manufacturing enterprises. Zhongnan University of Economics and Law, 2022.

[9] Lai X, Yue S, Guo C, Zhang X. Does FinTech reduce corporate excess leverage? Evidence from China. Economic Analysis and Policy, 2023, 77: 281-299.

[10] Dai D, Fu M, Ye L, Shao W. Can Digital Inclusive Finance Help Small- and Medium-Sized Enterprises Deleverage in China? Sustainability, 2023, 15(8): 6625.

[11] Jue F, Yingdong W, Mengjie C. Banking Fintech, lending distance and banking competition: Based on the perspective of credit diversification. Contemporary Finance & Economics, 2024: 1-14.

[12] Jackson A B. Financial statement analysis: a review and current issues. China Finance Review International, 2022, 12(1): 1-19.

[13] Terence Taileung C, Liping Steven O. Does banking competition alleviate or worsen credit constraints faced by small- and medium-sized enterprises? Evidence from China. Journal of Banking & Finance, 2013, 37(9): 3412-3424.

[14] Santiago C V, Francisco R F, Gregory F U. Bank market power and SME financing constraints. Review of Finance, 2009, 13(2): 309–340.

[15] Mitchell A T, Petersen R G R. The effect of credit market competition on lending relationships. The Quarterly Journal of Economics, 1995, 110(2): 407–443.

[16] Habib H K, Ali M K. Banking sector competition and firms' financial constraints: Firm-Level evidence from developing economies. Journal of International Financial Markets, Institutions and Money, 2023, 88: 101848.

[17] Zhiwei Z, Dayong Z, Josef C B, Ali M K. Does bank competition alleviate financing constraints in China? Further Evidence from Listed Firms. Emerging Markets Finance and Trade, 2019.

[18] Zexan J, Zexin L. Comprehensive regulatory framework and policy recommendations for digital finance. Industrial Innovation, 2023, (04): 8-10. art A, 2024, 102157, 0275-531.