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The Impact Mechanism and Case Study of Financial Technology on Corporate Financing Constraints

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ABSTRACT

The financing constraints of enterprises are the core bottleneck that restricts their sustainable operation and innovative development, especially for small and medium-sized enterprises that face recognized problems in the industry such as information asymmetry, insufficient collateral assets, and narrow financing channels. Under the background of deep integration of digital technology and the financial field, financial technology provides a new path to alleviate financing constraints for enterprises by relying on mature technological advantages such as data processing, intelligent algorithms, and platform construction. This article adopts a combination of literature analysis and case studies to systematically sort out the theoretical basis of the impact of financial technology on corporate financing constraints. It focuses on analyzing the three core mechanisms of data-driven information asymmetry alleviation, platform based financing channel expansion, and intelligent risk pricing optimization. The actual application effect of these mechanisms is verified by taking online commercial banking services for small and micro enterprises (publicly available business models) and JD Technology supply chain finance (case disclosed on the company's official website) as examples. Research has found that financial technology can effectively alleviate corporate financing constraints by reducing transaction costs, improving financing efficiency, and covering blind spots in traditional financial services. However, it also faces industry wide challenges such as data security risks and inadequate regulatory adaptability. The conclusion of this article can provide reference for enterprises to use financial technology to optimize financing strategies and for policy makers to improve the financial technology regulatory system, thereby helping to solve the problem of "difficult and expensive financing" for enterprises.

KEYWORDS

Financial technology; Corporate financing constraints; Information asymmetry; Risk pricing; Case studies

1. INTRODUCTION

In a market economy system, the financing ability of enterprises directly determines their production expansion, technological research and development, and market competitiveness. Financing constraints have become a global challenge for enterprise development. Small and medium-sized enterprises in our country contribute more than 50% of tax revenue, more than 60% of GDP, more than 70% of technological innovation, and more than 80% of urban labor employment, but they have long faced the dilemma of "difficult and expensive financing". According to research and industry reports in many places, most of them encounter varying degrees of constraints in financing. Traditional financial institutions often allocate credit resources to large enterprises or state-owned enterprises due to insufficient understanding of their credit information and high risk control costs. The core causes of financing constraints for enterprises under the traditional financial system are information asymmetry and high transaction costs. Financial institutions find it difficult to obtain

comprehensive business data and credit status of enterprises, and can only rely on mortgage guarantees to control risks, resulting in small and medium-sized enterprises lacking collateral being excluded from the credit system. In addition, traditional financing involves multiple manual review procedures and long cycles, which cannot meet the short-term high-frequency financing needs of enterprises, especially small and micro enterprises. The development of the digital economy has given rise to financial technology (FinTech), which relies on technologies such as big data, artificial intelligence, blockchain, and cloud computing to reconstruct the financial service model and efficiency, providing technical solutions for breaking the financing constraints of enterprises. In recent years, China's fintech industry has developed rapidly, with the scale of enterprises taking shape and the penetration rate in areas such as credit, payment, and supply chain finance continuing to increase. In this context, exploring the specific mechanisms through which financial technology affects corporate financing constraints and verifying the effectiveness of these mechanisms through case studies holds both theoretical value and practical guidance for corporate practice and policy-making [1]. This article follows the logic of "theoretical basis mechanism analysis case verification challenges and countermeasures conclusion" to systematically analyze the impact of financial technology on corporate financing constraints, ensuring that the content is authentic and relevant to reality, and providing feasible ideas to alleviate this constraint.

2. THEORETICAL BASIS FOR FINANCIAL TECHNOLOGY TO ALLEVIATE CORPORATE FINANCING CONSTRAINTS

The impact of financial technology on corporate financing constraints is supported by mature economic and financial theories, with information asymmetry theory and transaction cost theory as the core. Both explain the causes of corporate financing constraints under the traditional financial system and provide theoretical basis for the role of financial technology.

2.1. Asymmetric Information Theory

The theory of information asymmetry was proposed by Akerlof, Spence, and Stiglitz, and its core is that there are differences in information between the two parties in market transactions, and the party with more information may use their advantages to harm the interests of the other party, resulting in low market efficiency. In corporate financing, it is reflected in pre event adverse selection and post event moral hazard: companies have a better understanding of their own business and repayment capabilities than financial institutions, high-risk companies may conceal negative information to compete for financing, and financial institutions may have difficulty identifying risks and may raise interest rates or refuse loans, leading to low-risk companies exiting; After obtaining financing, enterprises may change the use of funds (such as investing in high-risk areas), making it difficult for financial institutions to monitor the risk of bad debts in real time. Traditional financial institutions mainly rely on "hard information" such as corporate financial statements and collateral assets to alleviate this problem, but the lack of standardized financial data and sufficient collateral for small and medium-sized enterprises makes the problem more prominent. Financial technology relies on big data to collect "soft information" such as enterprise transaction flow and tax records, and uses algorithms to integrate and analyze to build a comprehensive credit profile, effectively reducing adverse selection and moral hazard and laying the foundation for alleviating financing constraints.

2.2. Transaction Cost Theory

The transaction cost theory was proposed by Coase and developed by Williamson, which suggests that market transactions have search, negotiation, supervision, and default costs that directly affect transaction efficiency. In traditional enterprise financing, financial institutions need to invest a large amount of manpower and resources to search for information, review applications, and supervise

funds, which leads to high transaction costs. For example, traditional banks have a low return on small loans to small and medium-sized enterprises due to their consistent review process and large loans, resulting in banks being unwilling to serve small and medium-sized enterprises and having a tendency towards "poverty loving and wealth loving" credit [2]. Financial technology relies on technology to reduce financing transaction costs: cloud computing and big data reduce information search costs, and financial institutions can obtain multi-dimensional data of enterprises online without the need for manual on-site research; Artificial intelligence and automated processes replace manual review to shorten approval cycles and reduce negotiation and supervision costs. Under the "310" model of online commercial banks, small and micro enterprises can apply online in 3 minutes, receive payments in 1 second, and have zero manual intervention for small and micro enterprises. Traditional banks require several days or even weeks for similar processes. This inefficiency makes it feasible for financial institutions to serve small-scale decentralized enterprise financing.

3. THE CORE MECHANISM OF THE IMPACT OF FINANCIAL TECHNOLOGY ON CORPORATE FINANCING CONSTRAINTS

The above theoretical basis of financial technology is to alleviate the financing constraints of enterprises through three core mechanisms: data-driven information asymmetry alleviation, platform based financing channel expansion, and intelligent risk pricing optimization. These three mechanisms improve the financing environment of enterprises from the dimensions of information, channels, and costs and have practical application support. Asymmetric information is the root cause of financing constraints for enterprises. Financial technology, with its multidimensional data acquisition and processing capabilities, alleviates this problem through data collection, model analysis, and dynamic monitoring. In the data collection stage, financial technology platforms obtain real business data from supply chain ERP systems, enterprise payment records, and tax sharing channels without the need for additional provision to reduce the possibility of fraud. In the model analysis stage, online commercial banks use machine learning algorithms to convert multidimensional data into a credit scoring system that can determine the repayment ability of small and micro enterprises without collateral, and can update data scoring in real time to avoid static information bias. In the dynamic monitoring stage, the platform tracks the status of mortgaged goods in enterprise operation and supply chain finance through real-time data monitoring of the Internet of Things to ensure compliance and risk signals of funds. The system alerts and improves the willingness of financial institutions to lend. Traditional enterprise financing heavily relies on bank credit and capital markets, and small and medium-sized enterprises have insufficient qualifications to enter the financial technology market. Through diversified online platforms, fintech expands financing paths. Supply chain finance platforms such as JD.com convert core enterprise orders into financing basis, and suppliers apply for loans based on orders. Funding providers use core enterprise credit to solve the problem of credit shortage for small and medium-sized enterprises. Equity crowdfunding platforms such as JD Crowdfunding and Angel Hub allow startups to participate in online project exhibitions, attracting investors to participate and reducing the risk of fraud in platform information review, achieving "financing+intelligence". Digital bill platforms such as the Shanghai Bill Exchange's "Digital Bill Trading Platform" use blockchain to record the entire process of bills, which is authentic and traceable. Small and medium-sized enterprises holding digital bills can quickly discount the cycle to a few hours, and the discount rate decreases with competition. Traditional financial institutions rely on manual evaluation for enterprise risk pricing, which poses a "one size fits all" problem. Small and medium-sized enterprises are often charged a unified high interest rate. Financial technology uses intelligent models to achieve "precise risk pricing" and match financing costs with enterprise risk. The core of enterprise risk is data-driven risk quantification, such as WeBank's "micro loan" comprehensive enterprise owner credit, enterprise flow and other data. If the interest rate is low, the interest rate will be low to achieve "one household, one price". Financial technology platforms serve multiple enterprises, geographically dispersed, and diverse industries. The "small dispersion" feature disperses risks without the need to raise interest

rates. For example, online commercial banks serve over 50 million small and micro enterprises with a single loan of less than 100000 yuan. From the perspective of operational effectiveness, the platform's non-performing loan ratio has been consistently below 1.5%, and the interest rate level of 4% -6% is also lower than the industry average; Based on real-time updated enterprise business data, the platform has also established a flexible interest rate adjustment mechanism: interest rates can be lowered when the enterprise's operations are compliant and performance is stable. Once there are risk signals, interest rates can either be raised or financing support can be suspended, completely breaking the limitations of traditional financial pricing rigidity [3].

4. THE IMPACT MECHANISM OF CORE TECHNOLOGIES IN FINANCIAL TECHNOLOGY ON CORPORATE FINANCING CONSTRAINTS

Fintech is a technology cluster composed of multiple types of technologies such as big data, artificial intelligence, and blockchain. Different core characteristics of different technologies have different impact paths and applicable scenarios on enterprise financing constraints. The following will analyze the differentiated impact mechanisms of the three mainstream technologies based on real cases [4]. The core advantage of big data technology is the collection of massive data and the integration of multidimensional information. It mainly alleviates financing constraints by breaking through the "information island" - in the traditional financial system, enterprise tax, social security and other data are scattered in different departments and difficult for financial institutions to obtain comprehensively. Big data technology activates the "soft information" financing value of small and medium-sized enterprises by cross platform docking and integrating fragmented information to build a complete enterprise credit profile. There are two types of applications: one is the "Tax Bank Interaction" platform, which is a government enterprise data sharing platform that connects enterprise tax data with the bank credit system. Enterprises with tax credit standards can apply for unsecured loans based on their tax records. For example, in 2024, the "Tax Bank Interaction" platform in Jiyuan, Henan Province, has accumulated more than 6 billion yuan in credit to market entities, and most enterprises previously lacked collateral and did not obtain traditional loans; The second is the logistics industry data alliance, which integrates multiple waybill data. Freight companies can apply for loans based on waybill volume and other data to solve the pain points of "light assets". The core advantage of artificial intelligence technology is automated decision-making and dynamic risk prediction, which affects the entire financing process by replacing manual cost reduction and improving the accuracy of risk judgment to reduce subjective loan rejection. The review process, such as the "Bailing" system of the online commercial bank, automatically identifies electronic certificates, receipts, and other documents of enterprises without manual verification. As of the end of 2023, it has served over 8 million small and micro customers with an average withdrawal amount of 45000 yuan, and its efficiency has significantly improved compared to manual verification; The monitoring process, such as some bank small and micro warning models, analyzes real-time cash flow, downstream payment situations, and other multiple variables to trigger warnings in advance and indirectly increase the bank's willingness to lend. The core characteristics of blockchain technology are decentralization, immutability, and traceability. By solving the "trust problem" in financing, constraints can be alleviated. In traditional financing, assets such as accounts receivable and inventory are difficult to authenticate, fake, and become collateral. Blockchain realizes "digital asset authentication" and "full process traceability" to endow asset financing value. In the field of accounts receivable, such as the central bank's "accounts receivable financing service platform", the on chain vouchers cannot be tampered with. As of 2024, it has facilitated over 2.2 trillion yuan in small and medium-sized financing, and the fastest completion time for a single transaction is one hour, far faster than traditional paper-based processes; In the field of inventory, "blockchain+Internet of Things" dynamically confirms ownership, uploads inventory information to the chain, and monitors it in real time. Banks can verify inventory in real time without manual inventory, serving thousands of manufacturing enterprises and maintaining a low financing non-performing rate.

5. CASE VERIFICATION OF FINANCIAL TECHNOLOGY ALLEVIATING CORPORATE FINANCING CONSTRAINTS

To verify the aforementioned theoretical mechanism, this section selects two public cases of online commercial banking services for small and micro enterprises and JD Technology supply chain finance. The business model and data can be cross verified through enterprise disclosure and third-party reports to ensure objectivity. The online commercial bank was initiated by Ant Group (established in 2015), with a core positioning service for small and micro enterprises, individual businesses, and farmers. As of 2024, we have served over 40 million related entities, with over 80% of them being "credit white accounts" that traditional banks cannot cover due to lack of collateral or credit records. Its core mode is "big data risk control+unsecured credit loan": through docking with Alipay, Taobao and tax departments, obtain business data such as enterprise transaction flow, order size, tax payment records (no additional materials are required), build a credit scoring system through the "big titmouse" model, and the qualified enterprises will automatically obtain a line of 10 million yuan to 1 million yuan, with the fastest one second loan; Real time tracking of business data after loan, automatic credit adjustment or suspension in case of risks. This model has achieved significant results: the average loan disbursement is less than 1 minute, the financing cost is reduced by 35% compared to traditional banks, and the non-performing loan ratio is 2.3% in 2024 [5]. For example, a newly established toy factory on the 1688 platform was refused loans by traditional banks due to lack of collateral. Online commercial banks granted credit based on its transaction records, and the funds were quickly received to meet the demand for raw material procurement. JD Technology relies on JD Mall and logistics resources to provide order financing services for small and medium-sized enterprises in the supply chain. Its core product "Jingbaobei" will serve over 100000 suppliers by 2024, with a cumulative financing of over 200 billion yuan. The model is "data exchange+order confirmation+fast loan disbursement". For upstream suppliers, they can apply for loans based on JD's purchase orders (with credit endorsements on the orders), which will be verified by the platform and matched with the funding party. The loan will be disbursed at 70% -90% of the order amount, and JD will directly repay the loan to the funding party after receiving the goods; For downstream distributors, apply for loans based on stocking orders and repay with income after sales. This model uses JD Credit to supplement the credit gap of the enterprise, and the financing cycle matches the operating cycle. For example, a upstream supplier of TCL air conditioners needs to purchase raw materials during peak seasons but lacks funds. With orders from JD.com, they can obtain loans 24 hours a day to ensure production and increase current sales by about 20%. Repayments will be directly transferred from JD.com.

6. REALISTIC CHALLENGES AND OPTIMIZATION PATHS IN THE APPLICATION OF FINANCIAL TECHNOLOGY

Fintech can effectively alleviate the financing constraints of enterprises, but in practical applications, there are still three major challenges: data security risks, insufficient regulatory adaptability, and weak digital capabilities of small and medium-sized enterprises. Solutions need to be found at the policy, technology, and enterprise levels. Data security risks are the primary challenge. Fintech relies on sensitive data such as business operations and transactions, and insufficient platform protection can easily lead to data leakage and abuse. Due to system vulnerabilities, some supply chain finance platforms have caused information leakage of small and medium-sized enterprises, leading to fraud and fraudulent loans; Another platform collects unnecessary data, infringing on the rights and interests of data related parties. Insufficient regulatory adaptability constrains fintech innovation. The iteration of financial technology is faster than regulatory policies, and some businesses lack clear supervision, which poses compliance risks. In the early stages of equity crowdfunding, due to the lack of clear rules, false financing and fundraising from unqualified investors occurred, and multiple platforms were investigated and punished; Different cross regional regulatory standards also increase

platform compliance costs and limit service scope. The weak digital capabilities of small and medium-sized enterprises hinder the penetration of financial technology. Some traditional small and micro enterprises lack digital devices and skills, and transaction data is still recorded on paper, making it difficult to meet online financing requirements. According to relevant research, only about 30% of small and medium-sized enterprises are proficient in using financial technology platforms for financing. At the policy level, it is necessary to improve regulatory and data sharing mechanisms: establish dynamic frameworks such as "regulatory sandboxes" and clarify business scope; Promote the government to take the lead in integrating data from multiple departments, such as the Jiangsu Comprehensive Financial Services Platform, and the compliance platform can obtain data with the consent of enterprises and regulatory review. At the technical level, it is necessary to strengthen security protection and algorithm optimization: the platform uses encryption technology, hierarchical access to protect data, and regularly audits vulnerabilities [6]; When optimizing algorithms, potential indicators such as patents and R&D investment should be included without discrimination against startups. At the enterprise level, it is necessary to enhance digital capabilities and credit awareness: the government collaborates with platforms to conduct training and provide free digital tools. For example, Alibaba's related program has trained hundreds of thousands of business owners; Guide enterprises to operate in a standardized manner, actively provide real data, and maintain their own credit and data rights.

7. CONCLUSION

This article studies the impact of financial technology on corporate financing constraints through theoretical analysis, mechanism analysis, and case verification. The core conclusions are as follows: Firstly, financial technology provides technical solutions to alleviate corporate financing constraints, based on information asymmetry theory, transaction cost theory, and financial exclusion theory. In traditional finance, information asymmetry makes financial institutions "afraid to lend", high transaction costs make them "unwilling to lend", and financial exclusion makes enterprises "unable to lend"; Fintech uses data processing, platform building and other technologies to alleviate problems from the root and open up new financing paths. Secondly, fintech alleviates financing constraints through three major mechanisms: data-driven construction of corporate credit profiles to reduce adverse selection and moral hazard, platformization to expand financing channels such as supply chain finance, and intelligence to match financing costs with corporate risks. The three mutually support each other, forming a "closed loop" that affects financing constraints. Thirdly, the effectiveness of case verification: Online commercial banks provide services to over 40 million small and micro enterprises that are difficult for traditional banks to cover, achieving instant loans, low interest rates, and a non-performing loan rate of 2.3% by the end of 2024; JD Technology relies on core corporate credit to provide financing for upstream and downstream small and medium-sized enterprises, covering millions of small and micro enterprises. Fourthly, financial technology faces challenges such as data security and regulatory adaptation, requiring collaboration among policies, technology, and enterprises: policy improvement, regulation and data sharing, technology strengthening security protection, and enterprise enhancing digital capabilities. The research has limitations: the cases mainly focus on Internet banking and supply chain finance, and do not cover equity crowdfunding; In the future, case studies can be expanded to analyze industry differences. Overall, financial technology is an important force in alleviating financing constraints, and its role becomes more prominent when the technology matures, providing support for the real economy.

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