

Digital Finance in Reducing Corporate Debt Default Risk: From the Perspective of Risk Management Theory

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Abstract: This paper explores how digital finance can reduce corporate debt default risks and constructs a theoretical framework from the perspective of risk management theory. The study finds that digital finance effectively reduces corporate debt default risks through six dimensions: improving information transparency, optimizing debt structure, enhancing risk management capabilities, reducing financing costs, increasing debt repayment efficiency, and innovating risk management tools. Through case analysis, this paper specifically illustrates the application of digital finance under the risk management theory framework using examples such as Ant Financial, JD Finance, and Tencent Wealth Management, and summarizes its implications for corporate debt risk management. The research results show that digital financial technology has a significant positive impact on reducing corporate debt default risks, but it also carries certain risks. Therefore, companies need to establish and improve their risk prevention systems when using digital finance to reduce debt risks to ensure the stability of financial markets and the healthy development of enterprises.

Keywords: Digital finance; Corporate debt; Default risk; Risk management; Case analysis

1. Introduction

As With the rapid development of information technology, digital finance as a new financial model is gradually penetrating into all aspects of corporate operations. Digital finance, with its advantages of convenience, efficiency, and low cost, provides new avenues for corporate financing and also offers the possibility of reducing corporate debt risks. However, in recent years, the scale of corporate debt in our country has continuously expanded, and debt risks have gradually become apparent, not only affecting the healthy development of enterprises but also bringing potential risks to the entire financial market. Corporate debt risk issues are one of the significant obstacles affecting the stable growth of our economy. Against this backdrop, the rise of digital finance offers new perspectives and methods for corporate financing and debt risk management. Through technological innovation, digital finance optimizes financial resource allocation and improves the efficiency of financial services, thereby reducing corporate debt risks to a certain extent. Exploring how digital finance can reduce corporate debt risks is of great theoretical and practical significance. This article aims to start from risk management theory, analyze how digital finance reduces corporate debt risks, and summarize the corresponding theoretical mechanism framework, aiming to help more enterprises utilize digital financial tools to reduce corporate debt risks.

This article first summarizes the current development status of digital finance and its application in corporate financing; then analyzes the mechanism by which digital finance reduces corporate debt risk; finally, combining practical cases, it explores specific application strategies of digital finance in corporate debt risk management and summarizes the corresponding impact framework. It is hoped that through this research, useful references can be provided for reducing debt risks of Chinese enterprises. Specifically, this article introduces risk management theory and discusses the impact mechanisms of how digital finance reduces corporate debt risk from the following aspects:

Risk management begins with risk identification, which digital finance enhances through big data and AI for accurate financial analysis. It offers real-time monitoring for anomalies and precise risk assessment models using machine learning. Digital finance tools provide comprehensive risk evaluation, quantifying financial risks and enabling dynamic assessments. Effective risk control is achievable through various methods like debt diversification and hedging with financial derivatives. Continuous risk

monitoring with digital finance allows for timely responses and improved transparency. Risk response strategies include quick financing solutions and debt restructuring support. While digital finance aids in reducing corporate debt risks, it also introduces new risks, necessitating the establishment of robust risk prevention and control measures. The research contributions of this paper are mainly reflected in: First from the perspective of risk management theory, it explores the impact of digital finance on corporate debt default risk expanding the study of factors influencing corporate debt default risk. Second from the perspective of risk management, it outlines the theoretical foundation and internal logic of whether and how digital finance can play a positive role for enterprises distinguishing from existing literature on verifying the impact of digital finance on corporate financial behavior deepening the theoretical mechanism of how digital finance promotes corporate development. Third it further provides decision-making references for planning the development direction of digital finance in China and optimizing the development environment of digital finance.

2. Manuscript Preparation

2.1 Literature review and research content

2.1.1 Enterprise debt risk management

In recent years, domestic and foreign scholars have mainly focused on the following aspects of enterprise debt risk management: Scholars generally believe that correctly identifying and assessing debt risks is the prerequisite for corporate debt management. Liu Xiaohui (2019)[1] constructed a corporate debt risk evaluation system based on financial indicators, identifying and classifying corporate debt risks through factor analysis and cluster analysis. Zhang Lihua (2020)[2] applied the fuzzy comprehensive evaluation method to assess corporate debt risks, providing a basis for formulating risk management strategies. Further research found that corporate debt risks are influenced by multiple factors. Li Xiaoyan (2018)[3] analyzed the impact of equity structure and board structure on corporate debt risks from a corporate governance perspective. Wang Fang (2019)[4] believes that macroeconomic environment, industry characteristics, and the company's own operating conditions are the main factors affecting corporate debt risks. Additionally, Chen Xiaoming (2020)[5] pointed out that entrepreneurs' risk preferences also influence corporate debt risks. Regarding the prevention and control of corporate debt risks, scholars have proposed various strategies. Yang Li (2018)[6] believes that improving internal control levels and strengthening risk management awareness can help reduce corporate debt risks. Li Na (2019)[7] explored strategies for hedging debt risks using derivative financial instruments from the perspective of financial innovation.

In summary, research on corporate debt risk management has achieved fruitful results, but there are still certain shortcomings. Firstly, the identification and evaluation methods of corporate debt risks in existing studies are not yet unified and require further exploration; secondly, the research on factors influencing corporate debt risks is relatively scattered and lacks systematic analysis; finally, studies on corporate debt risk management need to integrate the latest perspectives, such as those from digital finance, to provide stronger theoretical support for corporate debt risk management in China. Future research can build on this foundation to further improve the theoretical framework of corporate debt risk management, offering valuable references for the healthy development of Chinese enterprises.

2.1.2 Risk management theory

Risk management, as an effective management tool, aims to identify, assess, control, and monitor various risks faced by organizations to reduce losses and increase profits. In recent years, with the advancement of global economic integration, the risks faced by enterprises have become increasingly complex and diverse, leading to widespread attention and in-depth research on risk management theory. In recent years, researchers have explored risk identification from various perspectives. The development of big data and artificial intelligence technologies has offered new methods for risk identification. Additionally, many researchers have focused on identification methods for supply chain risks and financial risks. Accurately assessing the magnitude and likelihood of risks is crucial in risk management. In recent years, researchers have achieved significant results in risk assessment methods.

Zhang Huiyi (2021)[8] found that digital finance can reduce the risk of corporate debt default, and corporate governance and analysts' attention have a positive regulatory effect on this. Digital finance achieves risk reduction by improving the internal control level, and provides suggestions for the prevention and control of corporate debt risks. Wang Zhuquan (2020)[9] constructed a short-term financial risk assessment system that takes into account both stock and flow, finding that the overall

short-term risks of listed companies in the real economy are relatively low, but there are differences across industries and regions. The study points out the inadequacies of traditional risk analysis methods and calls for a reevaluation and reassessment of short-term financial risks in the real economy to prevent systemic risks. Wang Zhuquan (2019)[10] found that the theoretical flaws in traditional financial analysis systems lead to a severe underestimation of the efficiency of real economy funds and an overestimation of financial risks, which distorts capital allocation and hinders the healthy development of the real economy, providing a new perspective on the inefficiency of financial services in supporting the real economy. Song Xiaobin (2020)[11] noted that corporate size discrimination in credit financing is related to financial risk information distortion. They discovered that due to the shortcomings of traditional financial analysis systems, the financial risks of real enterprises are overestimated, exacerbating credit discrimination, particularly evident in long-term credit and state-owned enterprises. The study recommends reassessing credit discrimination and improving financial risk assessment models to enhance the efficiency of financial services in supporting the real economy.

In summary, in recent years, risk management theory has achieved abundant research outcomes. From risk identification, assessment, control to monitoring, researchers have proposed many new methods and perspectives. However, risk management theory still has certain limitations, such as the lack of uniformity in risk measurement methods and insufficient empirical research. Future research can further explore the integration of risk management theory with practical applications in order to provide organizations with more effective risk management strategies.

2.1.3 Digital finance and corporate debt risk management

The rapid development of digital finance has provided new perspectives and methods for corporate debt risk management. In recent years, scholars have conducted extensive research on the relationship between digital finance and corporate debt risk management. This article reviews relevant literature to provide a reference for future studies. Digital finance facilitates corporate debt risk management through technological innovation. According to Zhai Shuping (2022)[12], the development of digital finance helps reduce corporate financing costs and improve debt financing efficiency. Li Ming (2019)[13] argues that digital finance platforms can offer diversified financing channels for enterprises, optimize debt structures, and mitigate debt risks. Scholars have also explored the mechanisms by which digital finance impacts corporate debt risks. Wang Lei (2020)[14] points out that digital finance enhances information transparency, alleviating information asymmetry issues in corporate debt financing, thereby reducing debt risks. Meanwhile, Zhang Liang (2020)[15] finds that the development of digital finance has a nonlinear impact on corporate debt risks; moderate development of digital finance can help reduce debt risks, while excessive development may exacerbate risks. Additionally, in empirical research, Liu Xiaoyu (2021)[16] used panel data analysis to confirm the inhibitory effect of digital finance on corporate debt risks. However, existing research lacks a comprehensive understanding of the relationship between digital finance and corporate debt risk management. The relationship is still controversial, and future research can further explore.

In summary, digital finance provides new ideas and methods for corporate debt risk management, but related research is still in its infancy. Future studies can build on this foundation to delve deeper into the intrinsic connections between digital finance and corporate debt risk management, providing theoretical support for the prevention of corporate debt risks in China.

2.1.4 Theoretical analysis and research framework

Research indicates that with the continuous advancement and innovation of financial technology, its application in the financial services industry is becoming increasingly widespread, particularly demonstrating significant effectiveness in reducing customer debt default risks. Financial services firms can leverage financial technology to enhance information transparency, optimize debt structures, strengthen risk management capabilities, reduce financing costs, improve debt repayment efficiency, and innovate risk management tools among other strategies to significantly lower debt default risks. This paper aims to delve into these six aspects and combine them with practical operations of specific case companies to summarize and analyze how these strategies function in reality to reduce customer debt default risks.

This article first constructs a comprehensive analytical framework which will be developed around the following six dimensions: 1) enhancing information transparency by improving the accessibility and accuracy of information through financial technology means; 2) optimizing debt structure by leveraging the diversified financing channels provided by financial technology to mitigate risks; 3) strengthening risk management capabilities by exploring how financial technology can enhance enterprises ability to identify assess monitor and respond to risks; 4) reducing financing costs by analyzing how financial

technology can decrease financing barriers and costs for enterprises; 5) improving debt repayment efficiency by studying the role of financial technology in accelerating capital flow and settlement; 6) innovating risk management tools by examining the application of emerging technologies such as block chain smart contracts in risk management.

Specifically, this paper will introduce risk management theory and conduct in-depth mechanism studies to enhance risk management capabilities. We will explore how existing financial technology tools can be effectively integrated into the risk management processes of enterprises and how these methods can help identify and mitigate risk factors that may lead to debt default. Through specific analyses of case enterprises, this paper will reveal the mechanisms of financial technology role in risk management, providing theoretical guidance and practical references for financial service enterprises. By analyzing the framework, this paper aims to offer more comprehensive and in-depth insights for financial service enterprises in applying financial technology to reduce debt default risks. The specific analytical framework is shown in Figure 1:

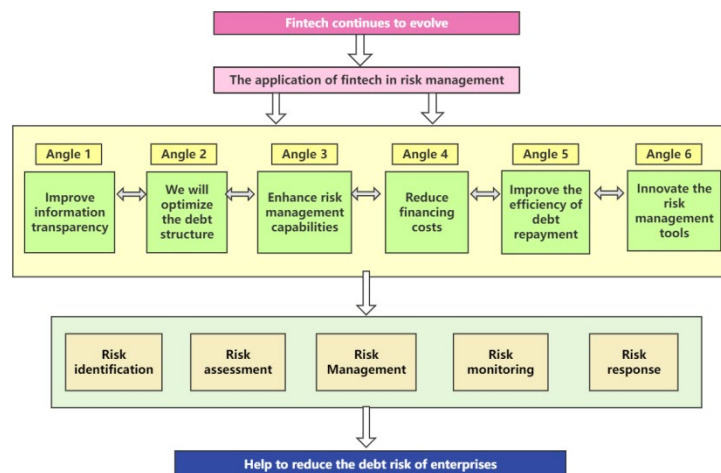


Figure 1: Theoretical analysis framework

2.2 Research design

2.2.1 Research methods

First, the core content of this paper is to study the intrinsic mechanism by which digital finance reduces corporate debt default risk. Considering that the reduction of corporate debt default risk is a dynamic evolutionary process and exploring the intrinsic mechanism is a complex issue, this study primarily adopts a cross-case research method. The specific reasons are as follows:

Case studies are well-suited for exploring the "Why" and "How" behind phenomena, and this study focuses on how local financial service enterprises achieve transformative models and pathway choices to reduce corporate debt default risks. Essentially, it is a case study focusing on the process, thus adopting exploratory multi-case studies is appropriate (Yin, 2002; Mao Jiye, 2020; Xu Hui et al., 2020).

Compared to single-case studies, multi-case studies can achieve more robust and generalizable conclusions through replication logic (Xu Hui et al., 2020; Han Wei et al., 2021). On one hand, the essence of multi-case studies is replication, which is an effective method for constructing theory (Eisenhardt, 1989); on the other hand, multi-case studies treat individual cases as data, achieving logical replication and verification of results within the data, inferring evidence from multiple sources and rechecking the consistency of results, thereby establishing converging evidence (Yin, 2002).

This study involves the comparative study of several financial service enterprises, focusing on the behavior of different enterprises to deal with default risk. Multiple cases can deeply analyze their mechanisms of action, and construct a reasonable causal chain for reducing corporate debt default in financial service enterprises through horizontal comparison.

Finally, this paper hopes to reveal how the digital and technological financial services can solve the pain points in the process of reducing corporate debt risks by studying leading enterprises in the financial service industry. Through the exploration of multiple enlightening cases, the mechanism of reducing corporate debt default risk is abstracted and refined. The research conclusions obtained can also inspire

other enterprises.

2.2.2 Case selection

The case study focuses on three top Chinese fintech firms: Ant Financial, JD Finance, and Tencent Finance, chosen for their representativeness and uniqueness in the financial services industry. These companies, with substantial scale and influence, operate across core fintech sectors and have distinct strategies due to their parent companies. Ant Financial is strong in payments and wealth management, JD Finance in e-commerce finance, and Tencent in mobile payments leveraging social networks. Their differing strategies make them ideal for studying fintech's role in risk management and credit assessment. The research is feasible, as these well-known companies have ample public data and case studies available for analysis.

2.2.3 Data collection

This study strictly adheres to the triangulation principle of data collection in case studies, striving to use multiple channels and diversified methods to gather information as follows: Firstly, public archival materials of the enterprise. During the investigation of the case company, research materials were obtained from the following sources: internal quality management documents, business manuals, company financial project (product) promotional videos, official Weibo accounts of the company and senior management, official company WeChat public accounts, etc. Secondly, third-party media reports search. Over 30 media reports from the case company over the past 5 years were collected, and AI products such as Zhishu Qingyan and Kimi ai were used for classification and comparative research. Thirdly, literature collection. Literature materials including books and journal articles from the case company since 2018 were collected.

2.3 Case description

2.3.1 Ant Financial

Ant Financial (Ant Financial) was founded in 2014 and is an affiliate of Alibaba Group. Initially established as the parent company of Alipay, which is one of the most popular mobile payment and digital wallet services in China, founded by Jack Ma, the founder of Alibaba Group, in 2004, Ant Financials business scope spans multiple financial and technological sectors, offering a variety of fintech products and services including Alipay, Yu e Bao, Huabei, Borrowing, Ant Insurance, Ant Wealth, Sesame Credit, Ant Financial Cloud, and MYbank. Ant Financials vision is to promote inclusive finance through technological innovation, making financial services more accessible, particularly to groups that are underserved by traditional financial services.

2.3.2 JD Finance

JD Finance (JD Finance), established in 2013, is a subsidiary of JD Group. Initially set up as an extension of JD Groups financial services sector, JD Finance aims to provide users with convenient financial solutions. JD Finance is one of Chinese leading fintech service platforms, led by JD Group founder Richard Liu. The business of JD Finance covers multiple areas of financial services, offering a variety of fintech products and services such as JD Pay, JD White Card, JD Little Treasury, JD Insurance, JD Wealth, and JD Crowdfunding. The mission of JD Finance is to achieve financial inclusiveness through technological innovation, making financial services more convenient and accessible, especially to small and micro enterprises and individual users who are hard to reach by traditional financial services. JD Finance is committed to leveraging technologies like big data, cloud computing, and artificial intelligence to drive the innovative development of financial services.

2.3.3 Tencent Finance

Tencent Wealth Management (Tencent Financial) was established in 2015 and is a financial services branch of Tencent Corporation. Initially set up as part of Tencent Groups financial business, Tencent Wealth Management aims to provide users with professional wealth management services. Tencent Wealth Management is one of Chinese leading internet-based wealth management platforms, led by Pony Ma, the founder of Tencent Corporation. The business scope of Tencent Wealth Management covers multiple aspects of wealth management, offering a variety of fintech products and services such as WeChat Pay, Tencent Wealth Management, Tencent WeBank, and Tencent Credit. The mission of Tencent Wealth Management is to enhance the efficiency of financial services through internet technology, achieve inclusive wealth management, and make wealth management services more convenient and accessible, especially to a broad user base that traditional wealth management services have struggled to

reach. Leveraging strong technical capabilities and user base, Tencent Wealth Management is dedicated to providing users with secure and efficient wealth management solutions.

2.4 Case analysis

2.4.1 Case analysis

1) Improving information transparency

Ant Financial: Innovates with a credit assessment system using Sesame Credit, leveraging big data and AI for accurate credit evaluations, and explores blockchain for secure transactions. JD Finance: Offers a data sharing platform for credit transparency and detailed credit reports for in-depth analysis, aiding financial institutions in credit decisions. Tencent Finance: Provides transparent corporate borrowing information and employs big data analysis for enhanced corporate information, fostering investor confidence and aiding in risk management.

2) Optimize the debt structure

Ant Financial: Offers a range of financing options for SMEs, including online microloans, with an intelligent matching service for optimal loan products and repayment plans. JD Finance: Provides customized financing and debt restructuring services to improve enterprise financial health and reduce default risks. Tencent Finance: Delivers expert debt consultation and diverse financing solutions to help businesses manage debt strategically and access necessary funds for growth.

3) Enhance risk management capabilities

Ant Financial: Advanced risk control model for evaluating loan applicant risk, with dynamic loan adjustments. Real-time monitoring systems identify and mitigate potential risks swiftly. JD Finance: Comprehensive risk control ecosystem with pre-loan to post-loan strategies. Intelligent risk control models using big data and machine learning enhance risk assessment precision. Tencent Finance: cutting-edge risk surveillance tools for real-time monitoring and quick risk response. Committed to educating managers on risk management to foster a proactive risk mitigation culture.

4) In terms of reducing financing costs

Ant Financial: Tech streamlines loan processes and cuts costs, enabling more affordable financing for SMEs. The company offers unsecured loan options tailored for SME needs, providing growth capital without the need for collateral. JD Finance: Provides cost-effective financing for SMEs, reducing financial expenses through its platform's technology. Automation of the approval process lowers operational costs, offering more accessible and affordable capital for business expansion. Tencent Finance: Efficiently matches fund supply and demand, reducing financing costs for corporations by streamlining the process. It promotes interest rate liberalization for fairer, competitive rates, fostering a transparent financial market that helps businesses make informed financing choices.

5) Improving the efficiency of debt repayment

Ant Financial's Automatic Repayment System streamlines loan payments, cuts down late payments, and informs borrowers of due dates with its Intelligent Reminder Service. JD Finance's Automatic Repayment Mechanism and Repayment Reminder Service enhance debt management and recovery for individuals and businesses. Tencent Finance's Intelligent Collection system increases debt collection efficiency with targeted strategies and offers easy repayment options to encourage timely payments.

6) Innovation in risk management tools

Ant Financial offers credit insurance to transfer default risk and securitizes assets for investor risk preference and objectives. JD Finance specializes in supply chain finance, reducing circulation risks with credit insurance and core enterprise guarantees. Tencent Wealth Management emphasizes credit rating for risk management, assessing business creditworthiness for informed investment and capital allocation.

2.4.2 Introduction of risk management theory

Ant Financial, JD Finance, and Tencent Wealth Management lead in using big data and technology for advanced risk management. Though aimed at reducing financial risks, their strategies vary. Analyzing risk management theory, we explore their unique methods for identifying, assessing, controlling, monitoring, and responding to risks. Each company's proprietary algorithms and systems highlight the innovation in fintech.

Risk Identification: Ant Financial uses advanced tech, particularly its CTU team, to detect various risks like fraud and money laundering through big data analytics. JD Finance leverages e-commerce data to identify user behavior risks, integrating this process with its retail platform. Tencent Wealth Management uses social network data to spot abnormal user behavior that could signal fraudulent or risky activities.

Risk Assessment: Ant Financial leverages big data technology to analyze user behavior and market trends, assessing the severity and likelihood of potential risks. For instance, the company evaluates the credit status of borrowers to determine loan amounts and interest rates, ensuring that the risk-reward profile is appropriate. JD Finance uses its data analytics capabilities to assess the creditworthiness of users, which informs decisions about credit limits and interest rates. Tencent Wealth Management employs data analysis technology to evaluate the risks associated with investment products, providing users with tailored financial advice that aligns with their risk profiles.

Risk Control: Ant Financial has implemented a comprehensive set of measures to control risks, including maintaining a conservative leverage ratio, diversifying risks across various financial instruments, and responding to market fluctuations through real-time monitoring and dynamic adjustment of risk control strategies. JD Finance adopts similar measures, such as risk diversification and establishing risk reserve funds, to mitigate potential threats. Additionally, Tencent Wealth Management controls risks through means such as diversified investment portfolios and rigorous risk assessment protocols.

Risk Monitoring: Ant Financial's CTU project team is tasked with the continuous and real-time monitoring of transactional behaviors and user activities to swiftly identify any anomalies. The company's risk control system is designed for extreme efficiency and risk equilibrium, using data-driven insights to inform and support decision-making processes. JD Finance utilizes big data and artificial intelligence technologies for real-time monitoring, enabling the company to promptly identify and address emerging risks. Similarly, Tencent Wealth Management keeps a close watch on market dynamics and user behaviors in real-time, adjusting investment strategies as necessary to manage and mitigate risks.

Risk Response: Ant Financial has a robust crisis management process in place to ensure a rapid and effective response to risk events. The company also engages in continuous improvement of its risk management strategies and processes by analyzing past cases of risk events to refine its approach. JD Finance establishes comprehensive emergency response plans to quickly and efficiently respond to and manage risk events. Tencent Wealth Management also formulates strategic risk response plans, which include measures to address both market risks and credit risks, ensuring that the company is prepared for a variety of potential risk scenarios.

2.4.3 Construction of theoretical framework

Through an in-depth case analysis of three prominent enterprises, the preliminary research framework has been significantly enhanced, leading to a series of relevant and insightful conclusions. These conclusions not only validate the theoretical underpinnings of risk management but also highlight the transformative role of digital finance in corporate debt risk management. The expanded findings are as follows:

Enhancing Information Transparency: Digital finance, with big data and blockchain, improves financial data transparency, aiding in corporate debt risk assessment. It reduces information asymmetry, curbing moral hazard and adverse selection for a stable financial system. **Optimizing Debt Structure:** Digital finance offers diverse financing options. It helps companies diversify their debt, reduce risks, and improve financial resilience through products such as P2P lending and crowdfunding. **Strengthening Risk Management:** Digital tools like credit scoring and risk management software enhance a company's ability to identify, assess, and respond to debt risks, supported by real-time monitoring and predictive analytics. **Lowering Financing Costs:** Digital finance reduces the cost of financial services, making funding more accessible and affordable, which decreases the risk of default due to high debt costs. **Improving Debt Repayment Efficiency:** Efficient digital payment systems speed up capital flows, facilitating timely debt repayment and reducing default risk from poor cash flow management. **Innovating Risk Management Tools:** Digital finance introduces tools like smart contracts for effective debt risk hedging and management, protecting against market volatility. Furthermore, by integrating risk management theory, a systematic approach to risk management in the financial service industry is developed, encompassing risk identification, assessment, control, and monitoring. This approach aims to effectively reduce corporate debt default risks:

Firstly, we can enhance information disclosure and refine the credit rating system to identify and

assess potential risks more accurately. Secondly, we can optimize debt structures, implement debt - restructuring strategies, and require guarantees and mortgages to control and mitigate risks. Finally, we can establish a dynamic monitoring mechanism and strengthen internal auditing processes to ensure the effective implementation of risk management measures. This comprehensive approach not only promotes corporate debt security but also contributes to the stability of the financial market as a whole. The specific analytical framework is shown in Figure 2:

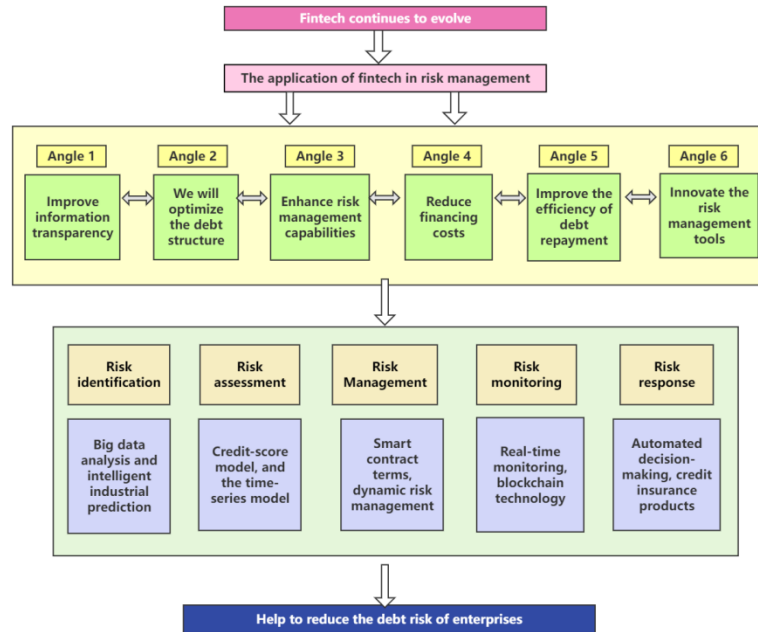


Figure 2: The theoretical analysis framework is further improved

3. Conclusion

This study explores the strategies employed by Ant Financial, JD Finance, and Tencent Wealth Management to decrease corporate debt default risks using digital financial technology. It finds that while all three companies use big data and advanced technologies for risk management, their approaches differ in execution. The research identifies six key areas where digital finance positively impacts debt default risks: improving information transparency, optimizing debt structure, enhancing risk management capabilities, reducing financing costs, improving debt repayment efficiency, and innovating risk management tools. The study also provides theoretical insights into how digital finance aids corporate growth. For financial institutions and enterprises, the study recommends embracing digital financial technologies to improve financial information accuracy, diversify financing channels, adopt risk management tools, and innovate with smart contracts to manage market-related risks. Despite these findings, the study acknowledges limitations in case selection, data sources, and the complexity of risk factors, suggesting a need for more comprehensive and internally-focused research in the future.

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