



A Literature Study on the Potential Risks of Financial Technology

Xiaoman Chen

School of Management Science and Engineering, Southwestern University of Finance and Economics, Chengdu, 611130, China
gongjie@ldy.edu.rs

Abstract. As an emerging sector within the financial industry, fintech has significantly enhanced the efficiency and innovation of financial services. However, this rapid development also introduces a range of potential risks, including systemic, regulatory, and technological risks. These risks are not isolated but rather interconnected, forming a complex network that can propagate rapidly across the financial system. The dynamic nature of fintech exacerbates these risks, challenging traditional risk management frameworks. While the existing regulatory systems are gradually evolving to incorporate more technological, automated, and intelligent approaches, they often struggle to keep pace with the rapidly changing landscape of fintech. There remain significant gaps in the timely identification and management of new risk points introduced by innovative fintech solutions. The evolving risks highlight the need for a more proactive approach to regulation, alongside continuous technological innovation and robust risk management strategies. Addressing these challenges is crucial for ensuring the sustainable and healthy growth of the fintech industry. This literature review explores the multifaceted risks associated with fintech and discusses the current state of regulatory frameworks, emphasizing the importance of adaptive regulation, advanced technological tools, and comprehensive risk management in safeguarding the future of fintech.

Keywords: Fintech, Potential Risks, Risk Management, Regulatory Framework.

1 Introduction

The report of the 20th National Congress of the Communist Party of China emphasizes the necessity to "adhere to the foundation of economic security" [1]. Fintech, as the deep integration of cutting-edge technologies (such as artificial intelligence, big data, blockchain, etc.) with the financial industry, aims to deepen the level of financial services and accelerate business processes. It not only breaks through the boundaries of traditional financial services and significantly improves operational efficiency, but also profoundly reshapes the competition landscape and risk profile of the banking industry [2]. As a result, fintech has become an important driving force for the transformation and upgrading of the global financial market and service system.

However, compared with the liquidity risk, credit risk, and other challenges faced by the traditional financial sector, the integration of fintech makes risks more complex. It also gives rise to new issues such as regulatory lag and data security. Regulators are facing unprecedented challenges and need to continuously iterate regulatory tools and strategies to cope with the evolving risk landscape.

Based on this, this paper analyzes the risk types and regulatory strategies of fintech by reviewing relevant literature from both domestic and international sources. The goal is to provide theoretical support and practical reference for accurately assessing its risks and formulating coping strategies, which holds certain academic value and practical significance.

2 Mechanism of Fintech Risks

2.1 Internal Mechanism of Fintech Risks

Fintech's Vulnerability. Fintech business is closely related to the traditional financial industry, so it inevitably inherits characteristics such as high leverage and high liquidity, which directly leads to a high risk level [3]. In addition, due to the deep integration of technology, a series of new risk dimensions have been introduced. This integration makes the path of risk propagation more hidden and significantly expands the scope of risk influence. Most importantly, when service providers, application platforms, and end users in the fintech ecosystem are closely linked into complex risk networks, the detailed analysis and responsibility attribution of risks become extremely complex and subtle. This complexity poses more severe and diversified challenges to financial security and the regulatory framework.

Information Asymmetry. On the one hand, due to the virtual, technology-intensive, and highly liberalized characteristics of the Internet, fintech has significantly increased the difficulty for both parties to obtain accurate information [4]. Under the interaction of massive data, enterprises may fail to make efficient use of this data [5]. In addition, the unbounded nature of fintech accelerates the spread of false information, posing a severe challenge to the verification of authenticity and validity of information. On the other hand, the virtual transaction mode in the fintech environment conceals credit risks that cannot be ignored. Data is essentially a record of the past, and currently, it is not possible to accurately predict the future based solely on historical data and existing rules. Moreover, it is even more difficult to comprehensively consider the changing factors of the external environment. Therefore, the effectiveness of this data in the current situation is limited. In the context of virtual transactions, this phenomenon of information asymmetry may be exploited by illegal activities such as unauthorized borrowing of goods or illegal fund-raising, which in turn could threaten social and economic stability.

Fintech Security. First, digital technology. Given that the core foundation of fintech products lies in IT algorithms, both operational errors and technical problems can have

adverse effects. In addition, a lack of awareness of fintech, coupled with cost control considerations, leads some institutions to adopt products that often have technical defects or lags. This can ultimately harm the interests of all parties involved in the transaction. Second, communication technology. Internet communication security inevitably has vulnerabilities at both the hardware and software levels, and these vulnerabilities constantly evolve with technological updates. This provides opportunities for hackers to attack fintech systems using methods such as viruses, trojans, and other malicious means. These attacks may lead to the leakage of personal privacy and cause property losses. In more severe cases, they may paralyze the entire fintech system and even affect related industries, having a profound impact on the real economy.

Cyclicity of Financial Markets. When the real economy is booming, it has a significant positive driving force on the fintech field, which is conducive to the steady growth and rapid progress of the fintech industry. On the contrary, if the real economy experiences adverse conditions, the negative effects will also affect the fintech industry, increasing the possibility of risk breeding and spread. Therefore, the closely linked symbiotic relationship between the two intensifies the transmission effect of cyclical fluctuations in the market economy, and then becomes an important cause for the continuous emergence of fintech risks.

2.2 External Mechanism of Fintech Risks

Long Tail Effect. Through technological and product innovation, fintech has simplified the transaction process, lowered the participation threshold, and broadened service boundaries [6]. This has attracted a large long-tail customer group. However, the traditional financial system has established a relatively robust risk assessment and prevention system, including the implementation of stricter screening standards for high-risk products. In contrast, long-tail customers often face fewer protective barriers, and their investment behaviors are characterized by small amounts and decentralization. This decentralization brings significant challenges to supervision, making it difficult to achieve comprehensive and effective monitoring [7]. Therefore, when potential risks accumulate to a certain extent and are released in a concentrated manner, the long-tail customer group is the first to be affected and may suffer significant losses.

Herding Effect. The herding effect significantly intensifies the ability of risk transmission and diffusion [8]. On the one hand, influenced by the positive publicity surrounding fintech, ordinary users tend to trust fintech products. Some participants may blindly recommend these products to others, leading to a phenomenon of irrational following. If there is misdirection or misinterpretation during the process of information transmission, such collective behavior can directly result in the loss of group interests. On the other hand, herd mentality is particularly pronounced in financial markets. Individual investors' irrational investment decisions, often based on false or misleading information, tend to spread rapidly due to the herd effect. This causes more investors to

blindly follow, which then evolves into widespread irrational investment behaviors within the group.

Dynamic Monopoly Effect of the Market. With the continuous emergence and development of fintech applications, fintech not only breaks the traditional Pareto equilibrium but also significantly improves the allocation efficiency of financial resources [9]. Its core is to use cutting-edge technology and innovative financial products and services to attract and lock in a large number of loyal users. This approach encourages users to develop stable operation habits and inertial dependence. However, this has also led some fintech companies to adopt strategies of illegal innovation in their pursuit of market share and excess profits. In an attempt to accelerate expansion, these companies may try to break through the boundaries of existing rules.

3 Existing Research on the Potential Risks of Fintech

3.1 Systemic Risk

The rapid rise of fintech has greatly promoted the deep integration of the financial industry and technology enterprises. It is particularly worth noting that during the downward cycle of economic pressure, the risk resistance ability of these enterprises is relatively weak. The operational difficulties or failure of any platform may quickly trigger a chain effect, spreading throughout the entire financial ecosystem like dominoes. This can then lead to systemic risks, posing a major threat to financial stability [10].

3.2 Regulatory Risk

With the rapid rise of digital currency, online lending and other emerging financial forms, the current regulatory framework is difficult to adapt to these changes in time, resulting in regulatory gaps 错误!未找到引用源。 . This not only makes some high-risk activities out of the scope of supervision, but also easily consents criminals to engage in illegal fund-raising, money laundering and other criminal activities, endangering the stability of the financial market and the rights and interests of consumers. At the same time, some tech companies are invading financial markets. However, they often lack sufficient capital reserves to resist the impact of market fluctuations, and their innovative business models and products are more likely to carry unknown risks 错误!未找到引用源。 . More seriously, the limited regulatory environment makes them likely to adopt more aggressive business strategies driven by the pursuit of profit maximization, and risk management is placed in a secondary position, thus extending the risk chain to the whole financial system.

3.3 Technical Risks

From a technical point of view, first, the financial system and technical infrastructure face threats such as hacker penetration, virus attacks, and malicious data tampering

[13]. These issues are significant enough to pose a major threat to business continuity. Secondly, the compatibility and robustness of software systems can create barriers to data flow between old and new systems, thereby reducing the efficiency of business processing. Moreover, fault-tolerant vulnerabilities in software design can easily trigger catastrophic consequences such as system failure or data loss. Finally, problems in data storage and transmission security at the hardware level can lead to the leakage of users' personal data. This may not only trigger legal proceedings and social controversies over user privacy protection but also seriously erode the credibility and market reputation of enterprises.

From an operational point of view, customers' lack of understanding of the system interface and operation process, as well as their negligence, may trigger personal risk events such as fund mis-transfers and incorrect investment decisions. If the software and systems of financial institutions have logic errors, performance bottlenecks, or other issues, they may induce abnormal transactions, inaccurate data, or even system paralysis. This directly affects the operational continuity and customer service ability of enterprises [14]. In addition, problems such as unclear authority division, imperfect monitoring mechanisms, or insufficient enforcement can lead to operational errors, including unauthorized access and internal fraud.

3.4 Other Risks

At present, the public generally lacks a deep understanding of financial transaction risks. Coupled with the widespread existence of information asymmetry, investors and consumers often face incomplete information or agency problems in the decision-making process. This situation aggravates the potential risks of default behaviors and criminal activities [15].

On the other hand, the lack of experience among emerging fintech companies makes them poorly equipped to identify and assess risks. In addition, their limited resource investment in the field of risk management makes it difficult to build a comprehensive and efficient risk management system and professional management team. As a result, these companies are more vulnerable to changes in the external environment, such as market fluctuations or shifts in policy orientation.

4 Suggestions on Strengthening Fintech Risk Prevention

4.1 Technical Dimension

At present, strengthening the security defense of core technology infrastructure and ensuring comprehensive coverage of network security, data protection, and privacy security are cornerstones of the steady development of the fintech industry. The financial sector needs to actively build a matching risk management system. First, implement a hierarchical protection strategy for information systems. Accurately identify and reduce potential risks in the field of fintech through the hierarchical protection evaluation mechanism to ensure business security.

Second, promote the transformation of risk management towards information. Widely adopt modern technical means such as information networks, deep mining and analysis of big data, intelligent monitoring, and automatic processing. This will enhance the accuracy, efficiency, and intelligence of risk management and inject new vitality into the financial industry.

Finally, establish and improve the fintech emergency plan system. The goal is to control the scope of risk to a minimum and reduce the time and cost of emergency response. At the same time, introduce an automated risk processing mechanism to provide immediate solutions for routine risk events and ensure the continuity and stability of financial services.

4.2 Legal Dimension

In view of the continuous deepening and expansion of the fintech field, as well as the emergence of new situations, challenges, and conflicts, it is necessary to comprehensively optimize and expand the laws and regulations related to fintech. This includes legal provisions to strengthen fintech security, market access, trading rules, identity authentication, regulatory mechanisms, market exit, consumer rights and interests defense, and legal liability investigation. The aim is to bring the vigorous development of fintech into the framework of the rule of law and accelerate the construction of a complete institutional guarantee system.

In the construction of the legal system, it should be committed to building a diversified and comprehensive legal ecosystem. This ecosystem should include government macro-control, clear market orientation, and deep participation from science and technology enterprises and financial institutions. The framework aims to guide the healthy development of the market through effective government regulation, stimulate market vitality, promote collaborative innovation between technology enterprises and financial institutions, and jointly lay a solid legal foundation for the long-term development of the fintech industry.

4.3 Regulatory Dimension

Integration of Fintech into the Current Regulatory Framework. First, given the new types of systemically important financial institutions that fintech has spawned, it must integrate them into the existing regulatory framework. These institutions need closer regulatory scrutiny to ensure greater loss tolerance and to tailor effective crisis response programs. In addition, the shadow banking business of fintech enterprises cannot be ignored. As these enterprises become involved in the financial services field, risks such as liquidity management, leverage ratio control, and maturity matching emerge. Therefore, they need to become the focus of regulatory attention. Moreover, the adaptive adjustment of the regulatory framework is crucial. It should be closely aligned with the evolution of the financial structure.

Reform of the Regulatory Framework for Fintech Development. In terms of regulatory strategy, strengthening the supervision of third-party outsourcing services is an inevitable choice. With the rise of fintech enterprises, they not only directly serve consumers but also support traditional financial institutions as service providers. Therefore, it is particularly important to enhance the supervision of these institutions. On the other hand, it is also crucial to build an effective dialogue mechanism between regulators and fintech enterprises. This aims to promote the vigorous development of financial innovation technology and the continuous optimization of financial service models. To this end, financial regulators can actively explore the establishment of innovation incubation platforms, accelerators, regulatory sandboxes, and other innovation testing sites. These platforms would provide a safe and controllable environment for fintech enterprises to conduct product and service innovation tests, thereby stimulating industry innovation while ensuring financial stability.

5 Conclusion

While promoting innovation and change, the development of fintech has also formed a complex network of systemic, regulatory, technological, and other risks. Once a risk event is triggered, its transmission speed and scope are rapid enough to affect the stable development of the financial market. In addition, the lag in the current regulatory system undoubtedly creates a hidden danger for the steady progress of fintech. This regulatory framework needs to be continuously updated and deepened to match the pace of fintech's development.

Although this paper explores the types of fintech risks and regulatory strategies, their limitations must be acknowledged. With the widespread application of technology, new forms and characteristics of risks may emerge continuously. It is challenging for this study to cover all emerging risks comprehensively. Additionally, fintech spans multiple dimensions such as finance, technology, and regulation, which raises higher demands for research. It is difficult to cover all relevant factors and variables in this context. Furthermore, external environmental factors, such as global economic fluctuations and changes in policy orientation, will exacerbate the challenges of risk management and regulatory strategy formulation.

Future research can deeply analyze the internal mechanisms of the deep integration between fintech and the traditional financial system, revealing its impact on the stability and service efficiency of the financial market. On the other hand, with the increasing maturity of technology, exploring how to use technological innovation to improve regulatory efficiency and build a harmonious symbiotic relationship between technology regulation and fintech development will become an important research direction. Additionally, the issues of data governance and privacy protection caused by fintech cannot be ignored. Future research should focus on building a stronger user privacy and data security protection network while promoting data circulation and value release.

References

1. Zhang, X. (2023). Research on Fintech Risk and Its Governance Mechanism. *Gansu Social Sciences*, (02), 225-236.
2. Xia, S., & Tang, L. (2020). Potential Risks of Fintech, Regulatory Challenges, and International Experience. *Credit Reference*, 38(09), 8-14.
3. Wu, Z. (2002). China's Financial Fragility: Comprehensive Judgment and Countermeasure Suggestions. *International Finance Research*, (08), 9-17.
4. Xu, S., & Zhang, Y. (2024). Can Fintech Curb Corporate Over-Indebtedness? *Journal of Zhongnan University of Economics and Law*, (03), 15-28.
5. Trott, P., & Hartmann, D. A. P. (2009). Why "Open Innovation" Is Old Wine in New Bottles. *International Journal of Innovation Management*, 13(4), 715-736.
6. Cheng, D. (2016). Analysis of the Current Application Status and Security Risks of Artificial Intelligence in the Financial Field. *Financial Technology Times*, (09), 47-49.
7. He, F. (2019). Solving the Dilemma of Banking Fintech Layout. *China Finance*, (03), 41-43.
8. Zhou, H. (2023). Study on the Herd Effect in China's Stock Market Based on High-Frequency Data. *Investment and Cooperation*, (06), 1-3.
9. Li, J. (2017). Pareto Equilibrium Mechanism of the Market under Information Asymmetry: A Rationality-Based Institutional Model. *Financial Theory and Teaching*, (05), 52-54.
10. McGuire, W. (2016). Adaptive Financial Regulation and Regtech: A Concept Article on Protection for Victims of Bank Failures. *Duke Law Journal*, 66, 567-604.
11. BaFin. (2018). Digitalisation Impact on Financial Markets, Supervision and Regulation. BaFin.
12. Huang, J., & Tao, S. (2023). Fintech in the Stage of Digital Intelligence: Risks and Regulation. *Lanzhou Academic Journal*, (06), 30-53.
13. Li, M. (2019). Systemic Risks of Fintech: Regulatory Challenges and Responses. *Securities Market Herald*, (02), 69-78.
14. Li, Z., & Ye, S. (2019). Research on the Development Status of China's Fintech and Regulatory Countermeasures. *Jianghuai Tribune*, (03), 54-59.
15. Yuan, K., & Deng, Y. (2019). The Application and Regulation of Fintech from the Perspective of Moral Hazard: Taking the Securities Market as an Example. *Securities Market Herald*, (07), 13-19, 40.

(Open Access Text)

Springer Nature will add OpenAccess standard text here during typesetting. Springer Nature will add OpenAccess standard text here during typesetting Springer Nature will add OpenAccess standard text here during typesetting. Springer Nature will add OpenAccess standard text here during typesetting. Springer Nature will add OpenAccess standard text here during typesetting. Springer Nature will add OpenAccess standard text here during typesetting. Springer Nature will add OpenAccess standard text here during typesetting.

[illegible]

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

