
Analysis of the Impact of Financial Technology on the Liquidity Risk of Commercial Banks

Mingrui Su*

School of Finance, Jilin University of Finance and Economics, Changchun, China

**Corresponding author: Mingrui Su.*

Abstract

With the rapid development of financial technology, the liquidity of commercial banks has undergone tremendous changes. Based on this, this paper comprehensively combs through a number of relevant core literature at home and abroad, discusses the impact of financial technology on the liquidity risk of commercial banks, the mechanism of financial technology on the liquidity of commercial banks, summarizes relevant research conclusions and puts forward corresponding suggestions. The results show that most scholars believe that fintech can increase the liquidity of commercial banks, improve the level of liquidity creation and reduce risks. The mechanism includes the effect of debt structure optimization and the effect of asset allocation efficiency improvement. These mechanisms reshape the liquidity and risk flow of commercial banks. A few scholars believe that the development of financial technology will bring liquidity challenges to commercial banks. The research conclusion provides a decision-making reference for the management of liquidity risk of commercial banks and the regulatory authorities to improve the supervision of financial technology.

Keywords

fintech, commercial banks, liquidity risk

1. Introduction

Finance is the blood of the national economy and an important part of the country's core competitiveness. The report of the 19th National Congress of the Communist Party of China proposed to “enhance the ability of financial services to the real economy”. In 2018, China issued the measures for liquidity risk management of commercial banks, emphasizing the need to strengthen liquidity risk management of commercial banks and ensure the safe and stable operation of the banking system. In the context of the digital economy, the rapid development of financial technology has profoundly reshaped the financial ecosystem and pattern through big data, artificial intelligence, cloud computing, blockchain and other technologies. The deep integration of fintech and commercial banks has constantly created new areas of finance. In the context of the impact of financial technology, traditional commercial banks' business operations are difficult to adapt to the digital management architecture, and the liquidity problem is prominent [1]. At the academic level, on the one hand, the existing literature mostly demonstrates the correlation between the two separately and lacks a systematic literature review. For example, the development of financial technology has significantly increased the liquidity risk of commercial banks on the whole, and the impact is more obvious in urban commercial banks [2]. On the other hand, the existing literature on business segmentation is insufficient [3]. Therefore, the study

of financial technology on the liquidity risk of commercial banks and how to improve the liquidity ability of commercial banks has important theoretical and practical significance for deepening the reform of the financial system.

This paper systematically combs through the relevant core literature, clarifies the transmission path of the impact of financial technology on the liquidity risk of commercial banks, explores the mechanism of the impact of financial technology on bank liquidity, and expands the trend of liquidity risk management and risk prevention boundary of commercial banks. The research conclusion enriches the theoretical research on bank liquidity risk, and provides an empirical reference for commercial banks to better use fintech to manage liquidity risk and serve the real economy.

2. Current Situation and Background of FinTech and Liquidity Management of Commercial Banks

Under the background of the rapid development of financial technology, the liquidity of domestic commercial banks shows obvious term mismatch and short-term deposit characteristics, which increases the liquidity pressure of large, medium and small banks. With the vigorous development of financial technology, commercial banks continue to innovate the financial service mode through the deep integration of emerging technologies such as big data and intelligent liability management. Some scholars believe that it reduces the liquidity creation function of banks, but mainly reduces the liquidity of the liability side, and has no significant impact on the liquidity of the asset side [4]. In the process of liquidity creation of commercial banks, it is closely related to the development of the real economy, and the two affect each other [5]. On the whole, the structural characteristics of the liquidity risk of commercial banks at this stage are obvious: the liquidity pressure of large banks is small, and small and medium-sized banks are more vulnerable to the liquidity impact caused by capital fluctuations [4]. From the perspective of assets and liabilities, fintech can improve the liquidity creation of commercial banks in general [6]. Under the influence of financial technology, Internet deposits have changed the debt structure of banks and profoundly changed the original liquidity pattern of commercial banks [7].

In view of the limitations of the original liquidity management theory, combining the relevant literature, it is found that the academic community has supplemented and revised the theoretical framework. First, the debt side theory is updated. Internet Finance and third-party payment continue to divert low-cost bank deposits, resulting in a significant decline in the stability of bank deposits, and the passive debt model is no longer applicable. Big data technology can accurately predict customers' capital behavior and form the digital liability management theory [8]. Banks use algorithms to predict deposit fluctuations and allocate funds in advance. Second, the iteration of asset side theory. Relying on big data risk control, commercial banks' online microfinance can achieve small, decentralized, high-frequency, improve asset liquidity, ease the liquidity pressure brought by long-term credit, and enrich the application boundary of expected income theory [9]. Third, the expansion of risk contagion theory. The traditional theory only considers the liquidity of a single bank. In the digital era, the cross-platform flow speed of funds has increased significantly, and the local liquidity tension will spread rapidly. Scholars have incorporated the network infection mechanism into the liquidity theory, forming a systematic liquidity analysis framework in the digital environment. In general, the theory of liquidity management has moved from single asset management to asset liability coordination. Under the influence of financial technology, it has added new content such as digital prediction and network risk contagion. The theoretical system has been constantly adapted to the current real environment of the banking industry.

3. Factors Affecting the Liquidity of Commercial Banks

3.1 Influencing Factors

The liquidity of commercial banks will be affected by both traditional factors and financial technology. Traditional influences include macroeconomic policies, economic cycles, banking regulation, and residents' savings habits. The results show that economic policy uncertainty (EPU) is the key transmission channel for monetary policy to affect banking output, and it is still strong in the indicators of bank liquidity creation [10]. The implementation of relevant regulations has significantly enhanced the liquidity creation of traditional deposit and loan business [11]. Other studies believe that reasonable development and promotion of green

credit business will improve the liquidity of bank funds. However, due to the promotion of economic globalization, commercial banks frequently carry out interbank business and increase their dependence on the interbank market; their liquidity risk has become increasingly prominent. Therefore, among the factors affecting the liquidity of commercial banks, traditional factors still play an important role. As an emerging technical force, fintech injects new vitality and challenges into the business and liquidity of banks.

In terms of the impact of fintech, most scholars believe that the technology spillover effect of fintech is greater than the market crowding out effect, which can improve the liquidity creation ability of commercial banks. On the asset side, commercial banks use technology updates to carry out online terminal services, accurately capture users' capital behavior, timely promote business products, and achieve the ability to quickly attract customers. Fintech promotes liquidity creation through the technology spillover effect. On the liability side, fintech inhibits liquidity creation through the market crowding out effect, thereby improving the efficiency and risk management level of financial service institutions [6]. In addition, the development of digital finance in favor of financial formats can further slow down the liquidity hoarding of commercial banks and make users' financial services more personalized, transparent and convenient. Fintech promotes technological innovation and improves liquidity by reducing enterprise financing costs. Fintech has a positive drive on business innovation and technological progress of commercial banks.

4. The Mechanism of the Impact of FinTech on the Liquidity of Commercial Banks

4.1 Effect of Debt Structure Optimization

The liquidity risk of banks stems from the maturity mismatch of assets and liabilities and risk transmission, which is specifically manifested in the lack of liquidity at the asset side or the sudden rise of financing costs at the liability side, and its risk-taking level is affected by risk appetite and external shocks. However, the in-depth application of financial technology reshaped the structure of bank liabilities: the allocation of residents' financial assets continued to tilt towards financial products, the deposit business was under pressure, and it was more difficult for banks to obtain low-cost funds, forcing banks to optimize the matching of assets and liabilities and improve the liquidity early warning mechanism. This phenomenon is affected by the dual role of the development of financial technology inside and outside the bank. At the level of debt structure optimization, fintech relies on big data technology to accurately obtain customers, break geographical restrictions through online channels, broaden deposit sources, improve their operational efficiency through business process optimization, strengthen risk management with the help of intelligent risk control, and improve the cost structure by using scientific and technological means [12]. Efficient online settlement and other systems accelerate capital turnover, increase the proportion of core stable deposits, reduce the volatility of deposits, consolidate the stability of the bank's liability side, and improve the overall liquidity level [13].

The development of banking financial technology will increase the ratio of non-deposit liabilities to deposit liabilities, reduce the relative proportion of liabilities-side deposits, and increase the proportion of demand deposits in deposits, which will affect the liquidity risk tolerance of banks. Through the above means, we can reshape the liquidity operation logic of commercial banks and increase the proportion of highly liquid assets. However, the development of non-banking financial technology industry has led to the loss of bank deposits and increased the difficulty of daytime liquidity management. Most of the existing literature focuses on the analysis of the external impact of financial technology, and there are differences in the research conclusions, such as the views that Internet finance promotes bank risk, the scale of third-party payment and the liquidity of large banks have heterogeneous correlation [14].

4.2 Effect of Improving Asset Allocation Efficiency

Relying on financial technology, it has brought more financing channels for commercial banks in terms of resource allocation. Through the Internet, blockchain and other technologies, banks can more easily obtain funds and flexibly adjust their asset portfolios, reduce financing costs and improve financing efficiency. In the business process, the digital settlement system simplifies the transfer, receipt and payment process, and accelerates the social capital turnover. The big data and intelligent risk control model can accurately identify the relevant risk coefficient of the borrower, shorten the credit approval cycle, and speed up the flow of credit assets. And because of the application of advanced technology, commercial banks have realized intelligent

business processes, which not only improves the speed and accuracy of bank business processing, but also reduces the cost in the process of resource allocation.

The development of fintech has expanded the scope of factor market allocation, eliminated hidden and institutional barriers that hinder the free flow of factors and orderly market access, and improved the overall factor productivity of real enterprises. It has further improved the price formation and adjustment mechanism and effectively corrected the problems existing in traditional finance, such as “resource mismatch”, “credit mismatch” and attribute, industry and stage-related mismatches. By improving the allocation of resources, promote the optimization of internal governance of commercial banks and further improves the efficiency of factor allocation. The further concentration of capital has attracted the convergence of high-end talents and technologies, fully responding to the core requirements of the development of new quality productivity and meeting its rigid demand for high-skilled, digital and advanced production factors. This ultimately promoted the improvement of market resource allocation efficiency and overall economic efficiency [15].

4.3 Long Tail Effect

The long tail effect was proposed by chrisanderson, editor-in-chief of Wired magazine, in 2004. It means that by focusing on a large number of niche markets or low-volume products, the overall market value will be greater than that of the mainstream market. Its core is to meet the huge niche demand. Although the profit of a single product is low, the overall market potential is huge. For commercial banks, long tail funds are small in size and large in quantity, sensitive to some customers, and have special needs, which are easy to disturb the liquidity of commercial banks. The development of new businesses and products with the help of fintech can promote personalized service and product diversification, and then attract more financial resources to match many long-tail customers and expand the bank's liquidity coverage. At the same time, the push and service mechanism of fintech superimposed on the digital system will break the edge effect, cover more small and Micro customers and meet the diversified new needs of customers, promote more funds to participate in the creation of liquidity in commercial banks, and improve the overall liquidity creation level of commercial banks.

5. Trends and Risks of Bank Liquidity Management under the Impact of FinTech

5.1 Development Trend

Under the background of the full penetration of financial technology, digital risk control has become a normal means of bank operation. The traditional liquidity management mode relies on the big data platform to realize the dynamic real-time monitoring of funds, and greatly improve the management accuracy. There is an effective threshold between the frequency of fintech risk control review and the intensity of punishment. Appropriate external supervision can form a positive cycle of “supervision → improvement → transition”. The forced back effect of risk thunderstorm events can accelerate the adoption and governance upgrading of fintech [16]. In addition, the risk level of city banks' credit is reduced. City commercial banks can manage deposit and loan business more efficiently, reduce the deposit-to-loan ratio, have more liquidity reserves, and better respond to potential liquidity shocks, thereby reducing the overall risk level [17].

5.2 Facing Challenges

With the increasing dependence of financial business on artificial intelligence, blockchain and other technologies, problems such as algorithm black box, data leakage and system vulnerabilities have become increasingly prominent. Some scholars believe that due to the convergence of product and service modes (homogeneous competition), differentiated competitive advantages have not been effectively formed [18]. Massive customer data brings a hidden danger of data leakage, and the algorithm model may have logical defects, which is easy to form model risk. Some scholars also believe that financial technology innovation improves bank risk, such as increasing risk exposure through product innovation and business expansion, and the impact of digital Finance on the financial environment, such as the process in which transaction costs and cognitive biases are integrated into systematic results, leading to risk spillovers [19]. In addition, the increase in the intensity of financial regulation will inhibit the impact of digital Finance on the risk-taking level of commercial banks, and it is very easy to induce systemic liquidity risk [20].

6. Conclusion

Based on the existing literature, it is concluded that in recent years, scholars have mostly studied the correlation between financial technology and liquidity of commercial banks, and less systematic combining of the two. Second, the research on the liquidity creation mechanism of commercial banks by fintech and the relevant literature are less. Third, since entering the “Fifteenth Five-Year Plan”, China has carried out less research and application of fintech in the liquidity of commercial banks. Fourth, on the whole, fintech can significantly improve the liquidity creation level of commercial banks.

From the bank level, commercial banks should take the initiative to lay out the construction of financial technology, use big data and other technologies to accurately predict the capital flow, stabilize the debt scale, alleviate the liquidity pressure caused by short-term deposits, optimize the credit asset structure with the help of digital risk control, and reduce the maturity mismatch. It is committed to building a new credit risk control system driven by science and technology, improving the ability of intelligent risk control, ensuring the quality of business and the safety of credit funds, and promoting the in-depth transformation of commercial banks from traditional credit mode to digitalization and intelligence. Moreover, commercial banks should implement differentiation strategies according to their own size, market demand and business scale to continuously improve their competitiveness. For the government regulatory departments, they should maintain the sound operation of the banking industry, establish a dynamic liquidity monitoring system, supplement the weakness of the supervision of Internet financial business, guide banks to develop digital business rationally, prevent disorderly competition, and hold the bottom line of the liquidity safety of the banking system, to prevent the occurrence of systemic risks.

References

- [1] Morelli, G., Pugliese, V., & Santucci de Magistris, P. (2025). Liquidity coverage at risk. *Quantitative Finance*, 25(2), 291–306. <https://doi.org/10.1080/14697688.2025.2457366>
- [2] Cheng, L. (2026). The impact of financial technology on the liquidity risk of commercial banks. *Business Observation*, 12(12), 69–72.
- [3] Yin, F., Jiao, X., Zhou, J., Yin, X., Ibeke, E., Iwendi, M. G., & Biamba, C. (2022). Fintech application on banking stability using big data of an emerging economy. *Journal of Cloud Computing*, 11(1). <https://doi.org/10.1186/S13677-022-00320-7>
- [4] Li, J., Wang, L., & Peng, Y. (2023). Bank fintech and liquidity creation. *Nankai Economic Studies*, (5), 3–18. <https://doi.org/10.14116/j.nkes.2023.05.001>
- [5] Berger, A. N., & Udell, P. (2014). Bank liquidity creation and real economic output. *Journal of Banking & Finance*, 81, 1–19.
- [6] Zhao, X., Li, S., Lu, K., & Zhong, Y. (2024). Intelligent transformation, fintech, and green growth: A general equilibrium analysis based on credit allocation perspective. *Journal of Environmental*.
- [7] Guo, P., & Zhang, C. (2023). The impact of bank fintech on liquidity creation: Evidence from China. *Research in International Business and Finance*, 64. <https://doi.org/10.1016/J.RIBAF.2022.101858>
- [8] Yu, W., & Zheng, J. (2021). Internet finance, deposit competition, and bank liquidity creation. *West Forum*, 31(2), 106–124.
- [9] Julapa, J., Lauren, L., & Timothy, L. (2021). Fintech lending and mortgage credit access. *The Journal of FinTech*.
- [10] Lee, E., & Alam, M. Z. (2026). Impact of monetary policy on bank liquidity creation: Economic policy uncertainty channel. *Journal of Banking Regulation*, 27(3), 39–39. <https://doi.org/10.1057/S41261-026-00340-2>
- [11] Li, M., Zhang, H., & Ruan, P. (2026). Strong financial supervision and divergence in bank liquidity creation: Empirical evidence from new asset management regulations. *Finance Research Letters*, 107, 109888.

- [12] Wu, X. (2022). Financial technology under the background of China Merchants Bank retail business transformation analysis. *Industrial Engineering and Innovation Management*, 5(12). <https://doi.org/10.23977/IEIM.2022.051204>
- [13] Song, K., Li, Z., & Yang, J. (2023). Fintech and bank behavior: From the perspective of liquidity creation. *Journal of Financial Research*, (2), 60–77.
- [14] Liu, Y. (2026). Research on the liquidity of smart deposits through financial technology innovation under the framework of asset liability management. *Procedia Computer Science*, 282, 2023–2031. <https://doi.org/10.1016/J.PROCS.2026.05.245>
- [15] Tang, Q., Xu, K., Zou, M., & Huo, L. (2026). Can FinTech empower companies to develop corporate new quality productive forces? Evidence from Chinese listed companies. *International Review of Economics & Finance*, 108, 105298. <https://doi.org/10.1016/J.IREF.2026.105298>
- [16] Li, G., Huang, Y., & Wang, Q. (n.d.). Four-party evolutionary game analysis of collaborative governance of digital supply chain financial risks embedded with fintech. *Systems Engineering*, 1–13.
- [17] Liu, Y., Tong, A., & Nourani, P. (2026). FinTech adoption and credit risk dynamics: Evidence from China's A-share banking sector. *Journal of Banking Regulation*, 27(2), 25–25. <https://doi.org/10.1057/S41261-026-00327-Z>
- [18] Ren, M., Zhao, J., Ke, K., & Li, Y. (2023). Bank homogeneity and risk-taking: Evidence from China. *The Quarterly Review of Economics and Finance*, 92, 142–154. <https://doi.org/10.1016/J.QREF.2023.09.002>
- [19] Nofsinger, J. R. (2026). FinTech as behavioral infrastructure: Digital platforms and the amplification of risk. *Journal of Behavioral and Experimental Finance*, 51, 101216. <https://doi.org/10.1016/J.JBEF.2026.101216>
- [20] Wang, R., & Cui, W. (2024). Research on digital finance, financial regulation and commercial bank risk-taking. *Economics & Management Review*, 5(3). <https://doi.org/10.37420/J.EMR.2024.046>

Funding

This research received no external funding.

Conflicts of Interest

The authors declare no conflict of interest.

Acknowledgment

This paper is an output of the science project.

Copyrights

Copyright for this article is retained by the author (s), with first publication rights granted to the journal. This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).