Research on the Digital Transformation Path of Risk Management in Commercial Banks

Dongcheng Xue[1, a]

[1]Nantong Nord School Cambridge International Center, Nantong 226000, China

[a]10294773@qq.com

Abstract. As economic uncertainties and complexities increase, along with the application of digital technology, the risks faced by commercial banks have become more diversified, complex, and novel. Once risks materialize, they can potentially lead to crises, posing significant hidden dangers to the high-quality development of commercial banks. Despite various risk prevention measures adopted by commercial banks, the absolute amount of non-performing loans remains high each year. In recent years, driven by rapid financial technology development and macroeconomic policies, a digital wave has swept through the banking sector. Chinese banks have accelerated their digital transformation across various aspects, offering customers better and more diverse financial products and services. However, the emergence of new products and tools also brings numerous issues that need to be explored and addressed. Therefore, this paper takes commercial banks as an example to explore the main risk issues arising during digital transformation. It integrates the inherent advantages of digital technology to innovate and apply new digital technologies, continuously improving the governance system of digital transformation in risk management.

Keywords: Digital Transformation, Commercial Banks, Risk Management.

1. The Importance of Digital Transformation for Risk Management in Commercial Banks

Digital transformation is crucial for risk management in commercial banks, as it enhances efficiency, strengthens monitoring capabilities, and fosters innovation through technological advancements. These improvements ensure that banks can respond robustly to market challenges[1-2].

Table 1. Outlines the significance of digital transformation for risk management in commercial banks.

Importance	Technologies such as big data and artificial intelligence are transforming the way banks operate.
Enhancing Risk Management Efficiency	Automated processing of massive data volumes enables rapid identification of potential risk points.
	Intelligent monitoring systems operate around the clock, providing real-time risk monitoring and prompt response.
	These systems reduce human errors and delays, thereby improving risk management efficiency.
	Digital technologies, such as big data analytics and machine learning, enhance risk sensitivity.
Strengthening Risk Monitoring Capabilities	They allow for real-time tracking of market dynamics, customer behavior changes, and transaction anomalies.
	These technologies enable precise risk identification and quick response, minimizing the impact of risks on bank operations.
	Real-time monitoring and early warning mechanisms increase risk sensitivity.
	New, more precise and efficient risk management tools are being developed.
Fostering Innovation in Risk Management	A data-driven, customer-centric risk management approach is being established.
	Innovation in risk management strategies is encouraged, allowing banks to better adapt to market changes and customer needs.
	Technologies such as big data and artificial intelligence are transforming the way banks operate.

1.1. Enhancing Risk Management Efficiency

In the context of the rapid development of financial technology today, digital transformation is crucial for financial risk management in commercial banks. The explosive growth of data, coupled with advanced technologies like big data and artificial intelligence, is gradually changing the way financial banks operate. Throughout their development, commercial banks can utilize relevant technologies to carry out risk management work. By automating the processing of massive amounts of data, banks can quickly identify potential risk points, achieving real-time and accurate risk assessment[3-4]. Intelligent monitoring systems can operate around the clock, ensuring real-time monitoring and timely response to risks, effectively reducing errors and delays caused by human factors, and truly improving the efficiency of risk management.

1.2. Enhancing Risk Monitoring Capabilities

As the market environment becomes increasingly complex and volatile, various risk events frequently occur during the operations of commercial banks, making them difficult to predict. Traditional risk monitoring methods can no longer meet the banks' requirements for risk sensitivity and timeliness. The reasonable application of digital technologies, such as big data analysis and machine learning algorithms, enables banks to capture key information like market dynamics, customer behavior changes, and abnormal transactions in real-time, achieving precise risk identification and quick response. This real-time monitoring and early warning mechanism significantly improves the bank's sensitivity to potential risks, ensuring that banks can take scientific measures to resolve risks at the early stages of exposure, minimizing the impact of risks on the bank's operations.

1.3. Promoting Innovation in Risk Management

Digital transformation will not only change the technological foundation of risk management in commercial banks but also promote a comprehensive upgrade of risk management models. Throughout their development, banks are no longer limited to traditional risk assessment models and prevention methods but are actively embracing cutting-edge technologies such as big data, cloud computing, and blockchain to develop more accurate and efficient risk management tools. The application of these tools can improve the precision of risk identification, enhance the automation level of risk management, and help banks respond flexibly to market changes and customer demands[5]. Furthermore, digital transformation encourages banks to form a data-driven, customer-centric risk management philosophy, driving continuous innovation in risk management strategies to adapt to the rapidly changing market environment.

2. Goals of Digital Transformation in Risk Management for Commercial Banks

2.1. Systematic Risk Management

The fundamental function and driving force of business development for commercial banks is to assume and manage risks. The digitalization of risk management must first be systematic, meaning that digital risk management must simultaneously cover both new and old risks, as well as large and small risks. It should establish an overall risk management mindset, ensuring the comprehensiveness and real-time nature of risk management. Digital risk management is not a partial solution for one type of risk; it must be a system-wide risk management approach that is horizontally comprehensive and vertically integrated. In specific operations, it may involve digital solutions for specific or individual risks, but it must be part of the systematic risk management process, constituting the overall digital risk management solution to achieve comprehensive management of all risk points and sources within commercial banks.

2.2. Technological Risk Management

In the process of carrying out financial management tasks in commercial banks, the advantages of digital technologies like big data and blockchain should be fully utilized. Conducting risk management based on digital technology can ensure the efficiency and accuracy of risk assessment results. The digital mindset should be employed to design risk management approaches, the digital language used to explain risk phenomena and causes, and digital methods to construct risk management models, embedded in every element and phase of risk management, serving the entire risk management process of commercial banks. To a certain extent, the risk management process of commercial banks is the process of applying and managing financial technology in the risk domain.

2.3. Intelligent Risk Management

From the initial customer selection and business engagement to the final completion of business operations, the full application of digital technology's information storage and self-learning capabilities can replace humans in basic, simple, and repetitive tasks in risk management. It can handle complex tasks like calculations, classification labeling, and risk identification, achieving a high degree of automation, intelligence, and wisdom in risk management throughout the entire process. Digital robots play an increasingly significant role in the intelligentization of risk management, capable of mimicking human learning and thinking[6], addressing the shortage of human resources, and using algorithms and models to quickly derive the information or solution recommendations needed for risk management. This enhances the decision-making level of risk management, with intelligent functions serving the entire process of risk management in commercial banks.

3. Problems in the Digital Transformation of Risk Management in Commercial Banks

3.1. Poor Systematic Risk Management

The digital transformation of risk management is a systemic project that requires a comprehensive top-level design to coordinate and connect various types of risks. However, current practices show significant issues with systematic risk management. The digitalization levels of various risks and their respective processes are inconsistent, lacking coordination and sharing, and the concept of systematic thinking is not sufficiently clear[7-8]. For example, the digitalization of risk identification, risk assessment, risk tracking, early warning mechanisms, real-time management during lending, and post-loan evaluations are progressing at different rates and lack tight interconnection and complementarity. Additionally, while the digitalization of primary risk management is advancing rapidly, the digitalization level of factors related to or impacting primary risks is relatively low. For instance, the digital management of collateral risk, which significantly affects credit risk, is underdeveloped. Among the foundational risk categories in commercial banks, such as interest rate risk, country risk, reputational risk, and operational risk, efforts towards digital transformation are uneven, leading some niche risks to evolve into broader risks.

3.2. Low Level of Intelligence in Risk Management

In the current context, intelligent risk management has become a key factor for commercial banks to enhance management efficiency and accuracy. However, the application of intelligence in risk management still faces many challenges, with a relatively narrow scope, primarily focused on the front-end stages of customer risk identification and selection, while the intelligence level in middle and back-office operations lags significantly. This situation limits the overall effectiveness of risk management, particularly when dealing with a complex and rapidly changing financial environment, making it difficult to cope. Although standardized personal loan products have achieved some degree of intelligent approval in the approval process, many non-standardized approval matters still heavily rely on the subjective judgment of managers, restricting decision-making efficiency and accuracy. Furthermore, the follow-up inspection and tracking mechanisms for implementing risk measures are inadequate, with delayed information feedback, making it challenging to monitor risk dynamics in real time.

3.3. Low Sensitivity of the Risk Early Warning System

Prevention is the core focus of risk management, and the prevention work relies on a complete and sensitive risk management system based on digital technology. However, due to objective factors, the risk early warning system and its depth in commercial banks still need improvement. Because the indicator system is incomplete, not all relevant indicators are included when constructing the early warning indicator system[9-10]. Some risks are only reported by the system after they occur. Due to the unscientific selection of some information, the early warning system fails to identify emerging risk indicators, resulting in low sensitivity to risk events, unable to provide proactive early warnings. Currently, there is still no complete risk early warning level and management system, as risks are graded and have a transmission process. At present, commercial banks mainly construct early warning indicator systems that affect their customers, such as settlement, loan interest repayment, loan commitments, and other specific indicators that may impact capital security, but have not yet established a comprehensive risk management system.

4. Pathways for the Digital Transformation of Risk Management in Commercial Banks

4.1. Increasing Investment in Financial Technology

In the digital age, financial technology is reshaping the financial industry, and its value in enhancing commercial banks' risk management capabilities is immeasurable. Therefore, commercial banks should deeply understand the value of financial technology and increase investment in this area, as shown in Figure 1. Specifically, commercial banks should focus on the cutting-edge trends of global financial technology, actively introducing advanced risk management technologies and equipment such as artificial intelligence, big data, and blockchain. These technologies can greatly improve the accuracy and efficiency of risk identification, achieve real-time and dynamic risk early warning, and provide strong technical support for the bank's risk management. At the same time, banks should also increase the cultivation of financial technology talents to provide a solid talent guarantee for the application and innovation of financial technology. After laying a solid foundation for these basic tasks, commercial banks will be able to build a more efficient and intelligent risk management system, laying a strong foundation for their steady development.

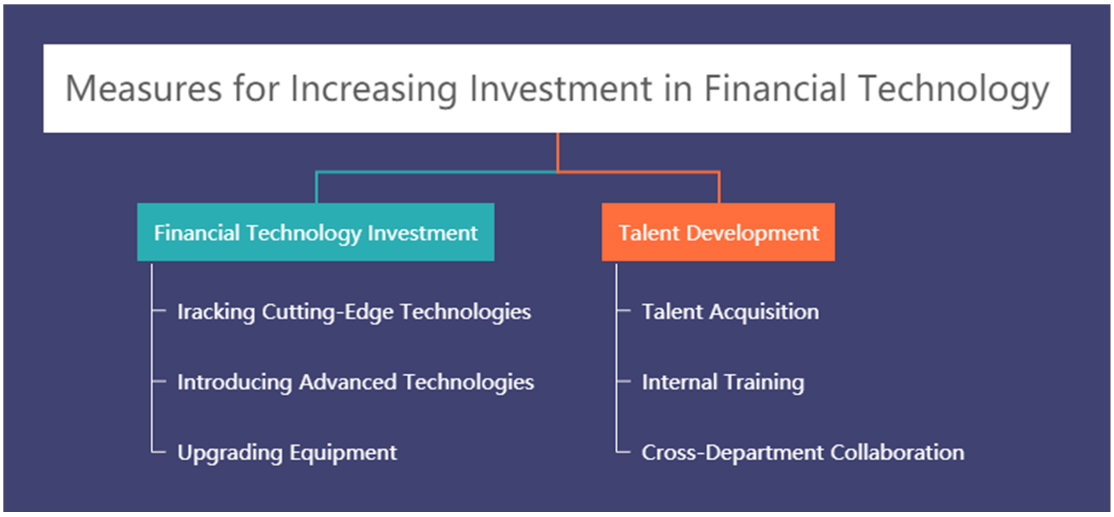

Figure 1. Measures for Increasing Investment in Financial Technology

4.2. Enhancing Risk Supervision Capabilities

During the digital transformation process, commercial banks face certain shortcomings in regulatory systems. Therefore, commercial banks need both external and internal forces to address the risks of inadequate supervision. From an external perspective, the state needs to formulate relevant regulatory policies. Regulatory agencies should establish and improve risk monitoring and early warning systems, utilizing risk databases to aggregate all operational data and monitor the indicators within the database. Regulatory agencies can also achieve distributed supervision through technologies such as blockchain, using big data to establish emergency plans, analyzing changes in the market entities' conditions to identify potential risk factors, and preemptively formulating response plans to maximize control over the consequences[11]. From an internal perspective, commercial banks should strictly comply with and implement the requirements and procedures of the state and regulatory agencies. They should also fully utilize their initiative, regularly hold expert meetings to discuss risk conditions, and provide a basis for the risk management department to formulate corresponding strategies through risk assessment reports on the digital transformation of various risks.

4.3. Cultivating Professional and Versatile Talents

With the continuous improvement of China's technological level, commercial banks should deeply recognize that possessing a large number of versatile talents is the foundation of digital transformation. Commercial banks can introduce and cultivate versatile talents through the following specific measures: First, banks should emphasize the construction of collective thinking among staff, strengthening the training of employees in learning and applying big data, enabling them to develop big data thinking to adapt to current development trends. Second, banks should not overlook the internal cultivation of the talent pool, regularly training and assessing employees' abilities in risk judgment, analysis, and monitoring to cultivate and retain a team of versatile, high-quality risk management employees. Furthermore, improving the incentive and restraint mechanisms, and providing certain rewards to outstanding employees, can help increase employees' sensitivity to risk prevention. Lastly, banks should strengthen employees' risk awareness by sorting out problem ledgers based on issues discovered in comprehensive inspections by the China Banking and Insurance Regulatory Commission, promoting effective rectification, and developing case study manuals. Organizing employee learning sessions during meetings can effectively enhance risk compliance awareness.

4.4. Optimizing Organizational Structure and Processes

Currently, many banks face issues such as poor communication between departments and isolated information silos, which severely restrict the comprehensiveness and timeliness of risk management. To improve the coordination and efficiency of risk management in commercial banks, the organizational structure and business processes need to be optimized, as shown in Figure 2. Banks should establish cross-departmental collaboration mechanisms, clarifying the responsibilities and roles of each department in risk management, ensuring smooth flow of risk information, and forming a cohesive force. Additionally, building a unified data-sharing platform that integrates risk data from different channels and systems allows for centralized storage, unified management, and efficient utilization of data[12-13]. This can enhance the accuracy and timeliness of risk identification, provide comprehensive and objective data support for risk decision-making, and effectively respond to various risk challenges, ensuring the stable operation of business activities.

Figure 2. Steps for Optimizing Organizational Structure and Processes

5. Conclusion

In summary, against the backdrop of accelerated global economic integration, commercial banks, as the cornerstone of the financial system, have risk management capabilities that directly impact financial stability and sustainable development. Faced with an increasingly complex market environment, commercial banks must combine development needs with essential risk management tasks. In the course of specific development, relevant personnel should recognize the importance of digital transformation in improving commercial banks' risk management efficiency, enhancing risk monitoring and early warning capabilities, and promoting innovation in risk management. They should also be aware of the drawbacks present during the transformation process, actively respond to the demands of the times, increase investment in financial technology, optimize organizational structure and processes, and promote comprehensive upgrades in risk management, contributing more significantly to the stable development of the financial industry.

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