

# Research on the Impact and Development of Fintech on Banks

Zhiyun Gong \*

School of Economics, Shanghai University, Shanghai, China

\*Corresponding author: gzy78916@shu.edu.cn

**Abstract.** This paper studies the effect of fintech on the development and transformation of banks, and selects several large commercial banks in China to compare their total investment in fintech in the past three years. The results show that in recent years, commercial banks have paid more and more attention to fintech, and their annual total investment in fintech keeps rising. In addition, effective risk control and the recruitment and retention of fintech professionals are two key factors in the digital transformation process of banks. When cooperating with fintech companies and developing products, banks need to establish a stable regulatory review process system to reduce the leakage of confidential data and the possibility and risk of high-tech product loopholes. Meanwhile, businesses ought to pay more attention to the recruitment of professional and technical talents, and narrow the salary level with IT companies by increasing salaries and benefits, so as to retain the employees who develop fintech products.

**Keywords:** Fintech; Banking; Digital Transformation.

## 1. Introduction

### 1.1 Background

Faced with the great impact of the wave of fintech, the traditional banking industry has experienced from the initial resistance and negative response to today's positive embrace and acceptance. At present, more and more banks are cooperating with fintech. According to a joint research report by IDC and SAP, 60% of global banks have regarded fintech companies as partners, and 25% of banks have acquisition intentions for fintech companies.

In China, ICBC, ABC, BOC and CCB have strategic cooperation with BATJ respectively, complementing each other's advantages and achieving a win-win situation. Investment in fintech by leading international investment banks also continues to rise. From 2015 to 2018, JPMorgan invested more than \$30 billion in technology development. In 2018, JPMorgan Chase spent more than \$10 billion on technology development, more than 10 percent of its revenue. In 2019, Citibank invested more than \$7 billion in information technology, or about 15% of its revenue. Dow Bank and UBS also invested more than 10 per cent of their revenues in information technology.

### 1.2 Related research

At present, many studies are interested in the connection and interaction between fintech companies and other financial institutions. Anagnostopoulos examines the effect of fintech developments on financial institutions and regulation by drawing on recent hot research in this area, and attempts to combine practice-driven research and academic research to provide multiple perspectives to understand the impact of fintech on the broader financial ecosystem [1]. Chen et al. use patent application data from 2003 to 2017 to classify fintech by base technology. It shows that most fintech innovations can generate significant value. The impact on finance is even greater when it involves disruptive technology from non-financial startups [2].

In addition, much research has been conducted on the impact of fintech development on banking business. Jagtiani and Lemieux use LendingClub account data and Y-50M data reported by Bank of America to explore the impact and connection of fintech loan platforms on consumers' credit access. It shows fintech can effectively fill credit gaps in local economies, and fintech lenders play an important role in supplementing unsecured consumer credit as the number of banks and offices declines [3]. Lee et al. use the SMF method and the dynamic GMM model to analyze the efficiency

marks of Chinese banks under various kinds of ownership structures and the influence on the efficiency of technology adoption in banks. The research shows the innovations of fintech play a positive role in improving bank cost efficiency and technology skills used by banks [4]. Zhao et al. use patent data and Fintech development index to study the correlation and influence between the innovations of fintech and the performance of Chinese banks. The results show that fintech innovations play a negative role in banks' profitability and asset quality, but plays a positive role in the capital adequacy ratio and management efficiency of banks [5]. Yang et al. analyze the correlation and potential impact between fintech and commercial banks. The result shows that fintech can play a positive role in the profitability and risk control of banks. Meanwhile, fintech can help banks reduce the operating costs improve their comprehensive competitiveness [6]. While Phan et al. use the data of 41 banks and fintech enterprises in Indonesia to study the influence of fintech on the performance of banks. It shows that fintech and the increase in the number of fintech companies play a negative role in bank performance [7].

Besides, there are also a lot of research on the impact of fintech development on credit and risk control. Zhang et al. take the fintech subsidiaries of Chinese banks from 2014 to 2018 as an example. It is concluded that fintech has a positive effect on alleviating pre-loan risks related to credit activities, but does not have obvious impact on post-loan risks [8]. Sheng analyzes the loan records of commercial banks in different regions of China from 2011 to 2018 to study the impact of fintech on the ability of commercial banks to supply credit to SMEs. It shows that fintech promotes the ability of banks to provide credit to SMEs, and the promotion effect of fintech is more significant for large banks [9]. Deng et al. studied the impact between fintech and the level of risk taking in the banking industry by using a benchmark regression model and analyzing the data from annual reports of 155 small banks from 2011 to 2016. It shows fintech can effectively reduce the level of risk-taking of banks, especially for large banks [10].

### **1.3 Objective**

This paper first describes the advantages and disadvantages of fintech for the development of banks, then shows the cooperative relationship between banks and financial technology companies and the investment of banks in the field of fintech, analyzes the difficulties of banks in the stage of digital transformation, and finally gives relevant suggestions that banks should pay attention to in the process of digital transformation.

## **2. The impact of fintech on banking change**

### **2.1 The positive impact of fintech on banking change**

The development of fintech is conducive to the development of traditional banking. The development of fintech provides a powerful tool for banking technology innovation and creates conditions for its business breakthrough and innovation. Specifically, banking can get rid of the shackles of time and space with the help of fintech. It has helped banks boost their profitability, improved their risk control capabilities and brought innovations to banks [6].

#### **2.1.1. Fintech uses technology to improve the probability of success in risk control**

An important prerequisite for risk control is the ability to identify the true identity of the customer. Financial technology can provide Banks with a series of biological recognition technology, such as face recognition, fingerprint recognition, iris recognition, etc., thus effectively preventing others from forging or using false identity information to defraud. Besides, it can protect the security of commercial banks' Internet products, such as mobile payment, online intelligent banking and other applications to a certain extent. Fintech can also provide powerful anti-money laundering solutions and help cut off credit risk at source [2].

Meanwhile, fintech can effectively help commercial banks improve the quality and management ability of their credit business. Through the fintech, they can realize the audit work before credit business, the dynamic monitoring task during loan and the collection work after business.

For example, before the formal occurrence of credit business, the bank needs to evaluate the credit qualification of the borrower. With the help of fintech subsidiaries, banks can mine and collect corporate information from more angles and process it more efficiently and accurately [3]. It provides extensive and relevant credit qualification information, and may even help the bank obtain the borrower's past transaction data. More comprehensive and extensive credit qualification information can effectively reduce the information asymmetry in the credit granting process and reduce the possibility of default risk of borrowers.

Different from the traditional risk control model of commercial banks, fintech risk control model has obvious advantages in information collection and analysis, and the automatic approval-monitoring system can more accurately predict and monitor default behaviors, so as to improve the prevention and control ability of credit risks [11].

### **2.1.2. Fintech is making banks customer-centric**

With the rapid development of science and technology, fintech is gradually changing the mode of financial service, and "openness and cooperation" has become the development direction of banks.

According to a report published by the CMA in August 2016, open banking could provide consumers, including small businesses, with new secure channels to share information, allow companies to offer ultra-fast payment methods, and aim to make it easier for enterprises to offer various types of innovative services and diversify the choices of consumers when they access these financial services, and strengthen the control on their funds and financial information.

Open banking emphasizes the user-centered approach and uses technology such as API and SDK to deepen business ties and cooperation between banks and third-party institutions through two-way openness and deeply integrate financial service capabilities with customers' life and production scenes. It is beneficial to optimize the allocation of financial resources, improve service efficiency and achieve win-win results.

Compared with traditional banks, the advantages of open banks lie in the following aspects. On the one hand, with the support and help of fintech, a wider range of big data platforms has expanded the scope of customer service for banks. By partnering with fintech and big data companies, banks can expand their target customer base to all corners of society. On the other hand, open banks can break technology monopoly, save capital investment and cost, and also make financial risks public when realizing data sharing, so as to achieve the purpose of risk control.

## **2.2 The negative impact of fintech on banking change**

### **2.2.1. Vulnerabilities brought by fintech and the negative impact on banks**

The development of fintech has promoted the emergence of various Internet financial products, bringing huge competitive pressure to the development of traditional banking business, which is obviously reflected in the liabilities, assets, payment and other aspects of traditional banking business.

With the development of fintech, banking industry has received huge shock and the total number of banks have kept a downward tendency. With Chinese banking as an example, overall number of, silver circ license information query system shows that: as of Feb. 8, the commercial banking institutions to withdraw from the list since 2022 in total there are over 2600 commercial bank outlets to terminate the business. Since 2023, with 119 lines of state-owned shares outlets, 24 outlets, 42 city business outlets have been cut. It is clear to see that nowadays traditional banks face a huge difficulty in existing in the financial industry.

Although banks have become paying increasingly attention to the independent research and development of fintech, instead of relying merely on the cooperation with the external technology enterprises and their technology, there are still many problems in application.

On one hand, independent development on new products needs a lot of costs, long waiting and experiment period. Even if banks transform from traditional banks to smart banks, it will take a lot of human resources, material resources and time. Large banks prefer to conduct independent research and development and establish their own fintech subsidiaries for independent innovations. In contrast, small and medium-sized banks do not have enough funds to support their own scientific and technological research and development, so they can only choose to cooperate with technology companies. Even if they choose to cooperate with technology-based enterprises, small banks are also under weak position. Innovations in fintech may exacerbate further concentration of the banking market structure. Small banks will face greater operational risks and operational pressure, and their situation in the banking industry will be more difficult [10].

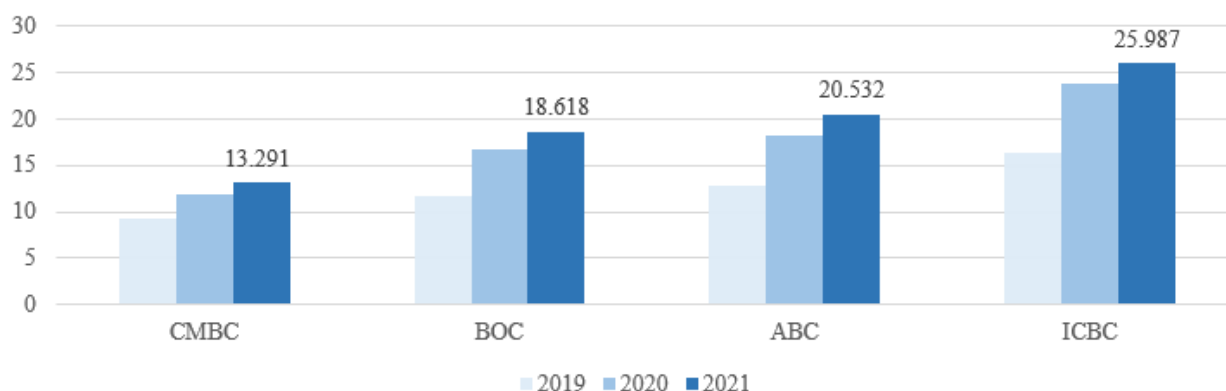
Nowadays, Chinese banks are generally faced with the dilemma of talent recruitment difficulties and serious loss of senior technical talents. The shortage of professional talents will directly affect the initiative and independent development ability, which makes it difficult for fintech innovation to achieve the high-quality innovation effect of customization, differentiation and specialty.

In terms of risk control, although many studies have proved that fintech can effectively improve the success rate of risk control of banks, fintech will also bring possible loopholes and negative effects. Fintech is highly professional and complex, especially in the application of fintech such as big data and cloud computing. When there are loopholes or errors in the model and algorithm, the practitioners of commercial banks may not be able to find and correct them in time. Especially in small banks, rural banks, etc., the technical quality of employees is uneven, the development of science and technology business is weak, and the lack of financial technology professionals. The existing loopholes will give criminals an opportunity to take advantage of it and bring negative effects to the credit risk control of banks. On the other hand, many rural banks and urban banks are located in areas with inconvenient transportation, and most of the objects served by the banks are farmers and rural enterprises. Such rural banks are not profitable enough to support their fintech development. The motivation to develop fintech is small and the difficulty is great. As time goes by, the distance between Fintech and large commercial banks will become bigger and bigger.

### **3. Analysis of banking application of fintech and current problems**

#### **3.1 The current state of bank-fintech cooperation**

As shown in Figure 1, some of the Chinese large commercial banks have increased their total investment in fintech in recent years, and the data comes from annual reports of CMBC, BOC, ABC, and ICBC in 2019-2021. Agricultural Bank of China (ABC) invested 12.79 billion yuan in information technology in 2019, 18.3 billion yuan in 2020 and 20.535 billion yuan in 2021. ICBC invested 16.374 billion yuan in fintech in 2019, 23.819 billion yuan in 2020, and 25.987 billion yuan in 2021. China Merchants Bank (CMBC) invested 9.361 billion yuan in information technology in 2019, 11.912 billion yuan in 2020 and 13.291 billion yuan in 2021. Bank of China (BOC) invested 11.654 billion yuan in information technology in 2019, 16.707 billion yuan in 2020 and 18.618 billion yuan in 2021.



**Figure 1.** The amount of money banks spent on fintech each year (billion).

Different banks are taking different approaches to recruiting fintech professionals. By the end of 2019, the fintech staff of Industrial and Commercial Bank of China was 34,800, accounting for 7.8% of the total staff. In 2020, there were 35,400 fintech employees, occupying 8.1% of the bank's employees; by the end of 2021, there were 35,000 fintech employees, taking up 8.1% of the total employees of the bank. However, China Merchants Bank pointed out in its annual report for 2021 that by the end of the report, its R&D staff had reached 10,043, an increase of 13.07% compared with the end of the previous year.

### 3.2 Difficulties for banks in using fintech

However, commercial banks still face various difficulties and challenges in digital transformation.

At present, the main problem is the lack of compound talent reserve. In the early days, traditional commercial banks focused on finance and economics when recruiting employees. As fintech continues to grow, banks have stepped up efforts to recruit IT professionals in recent years. At present, the main problem is that the application of fintech into banks needs compound talents with both of them, namely "finance + technology" talents, who can effectively combine traditional banking business with information technology to launch suitable and competitive products for banks. Therefore, there is a phenomenon that IT personnel in many institutions do not know enough about the real financial business, and part of IT personnel introduced by banks are mostly engaged in basic work such as maintenance and repair, while there are few talents in high-tech aspects such as software development, "0-1" innovation of financial technology products and big data application. With the exception of those with fintech subsidiaries, most institutions rely on the fintech companies they work with for all kinds of research and development. In addition, there is a certain gap between commercial banks and fintech companies in terms of salary standards and incentive mechanism, which cannot attract and retain talents well. The lack of compound talents has become one of the bottlenecks restricting the digital transformation of commercial banks [12].

For the large commercial banks, there are still problems. Scott et al. argue that when there are major breakthroughs or changes in fintech, small banks and small businesses can adjust their operations more quickly to adapt to internal and external changes. Larger banks and companies, however, were slower to respond to change because of the large number of changes they had to make [13].

The development and application of fintech require a large amount of financial support. Therefore, it can be seen that in recent years, with the continuous expansion of the concept of digital transformation of banks, many banks are increasing their financial investment in fintech. However, in terms of capital investment, the gap between small banks and large banks is still large. At present, there are two main ways for Chinese commercial banks to develop and apply fintech: setting up fintech subsidiaries and cooperating with external fintech companies. By the end of 2021, there are 18 banks in China with fintech subsidiaries. Large commercial banks mostly set up fintech subsidiaries depending on their advantages in capital scale, while small banks do not have economic and technological advantages in setting up fintech companies. Therefore, only 5 banks among more

than 4,000 small banks have set up fintech subsidiaries. They are Bank of Beijing, Bank of Langfang, Xiamen International Bank, Shenzhen Rural Commercial Bank and Guangxi Zhuang Autonomous Region Rural Credit Union. It is difficult for other small banks to set up their own fintech subsidiaries, so they have no choice but to cooperate with external fintech companies to promote digital transformation, making cooperation with external fintech company's mainstream [14]. While the use of information technology outsourcing also means new risks. Delegating IT work to other companies or service providers carries special risks compared with internal bank staff. Therefore, banks that choose to cooperate with external fintech companies also need to prevent and control the risk of IT outsourcing. Banks need to take various measures to strengthen the safety management of cooperation. Once the cooperation goes wrong, it may lead to bigger problems such as information system, product innovation and leakage of internal secrets of banks.

## **4. Development suggestions**

### **4.1 Risk control and supervision**

With the transformation of commercial banks' profit points and the improvement of financial service efficiency, commercial banks should form a set of systematic supervision mode to supervise cooperative Internet financial institutions, so as to avoid or reduce possible risks as far as possible, and meanwhile provide protection for the healthy development of fintech enterprises. Relevant regulatory authorities should keep pace with The Times, make good use of fintech to strengthen scientific and technological supervision ability, promote the regulatory system, and gradually apply scientific and technological means to the regulatory system to realize the close integration of fintech and regulatory system. At the same time, it can learn from the fintech management mode of other countries, strengthen the exchange of experience in cooperative supervision, and realize the organic integration of domestic and foreign fintech supervision system and management system.

In the face of digital transformation brings a series of potential risks, the commercial Banks to establish a complete system of risk management and prevention. For the newly developed projects, accurate assessment and risk testing should be carried out. Banks can establish a three-way risk control system, namely, the science and technology department tests the security of the new system, the risk control department assesses the risk of the new system, and the audit department regularly reviews the use of the system. Secondly, banks should improve their ability to identify and predict risks, sort out and analyze existing online and offline businesses, establish an integrated risk management and control mode, and conduct early warning of risks. Banks can also establish risk analysis models and risk disposal teams through technical means, which can quickly locate the location of risk points after the occurrence of risks, block the rapid spread of risks among enterprises, and try their best to recover the losses caused by the occurrence of risks [12].

### **4.2 The cultivation and introduction of professional talents**

At present, many commercial banks are in an important development stage of digital transformation, and to improve the core competitiveness of banks needs the support of professionals in the field of fintech.

First of all, commercial banks need to pay attention to the introduction and training of relevant high-tech talents. In terms of talent recruitment, commercial banks should strengthen the introduction of fintech personnel and staff through campus recruitment, social recruitment and other channels.

Secondly, banks should improve the relevant incentive mechanism and compensation mechanism, not only to be able to recruit talents, but also to retain talents. Commercial banks should take certain measures, such as the increase of encouragement mechanism and compensation mechanism, to narrow the salary and remuneration gap with other fintech companies and retain high-end talents, or make use of the policy advantages of local government talent introduction and attach certain supporting incentives to vigorously introduce and retain fintech composite talents.

In addition, banks also need to pay attention to the training of talent recruitment in the early stage. Banks may consider building cooperation platforms with local governments, fintech companies and colleges and universities to establish a multi-subject joint training system. Strengthen the cooperative relationship with colleges and universities, and build a systematic talent training system. For example, colleges and universities can be encouraged to increase the number of emerging science and technology courses related to big data, financial engineering etc., so as to cultivate professional talents from colleges and universities and provide sufficient talent reserve for the transformation and development of the banking industry.

Finally, the bank can find and explore talents from within, and improve the comprehensive quality of employees by developing training plans, carrying out online and offline business skills training, and implementing job rotation of staff in science and technology business departments, so as to explore the potential ability and advantages of employees, and cultivate personnel with a good command of business and technology.

## 5. Conclusion

Fintech has been playing an increasingly essential role in the development of commercial banks. This paper has studied the positive effects of fintech on the banking industry, such as risk control and credit business management, and the negative effects, such as loopholes in the development of fintech products, which will give criminals an opportunity to leak internal data, etc., during the transformation process of commercial banks at the present stage. The study found that commercial banks are paying increasing attention to fintech, which is mainly reflected in the rising total investment in fintech each year. At the same time, this paper puts forward two main suggestions for the future digital transformation and development of commercial banks. The first is to focus on the training and retention of cutting-edge fintech talents. Banks can establish cooperative relations with universities, cultivate relevant professional talents, and improve the salary and compensation of fintech talents in banks to retain high-tech talents. The second is to establish a more comprehensive and secure regulatory system to avoid privacy leakage when cooperating with fintech companies.

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