

Research on the Impact of Financial Technology on the Performance of Chinese Commercial Banks ——Taking the Retail Transformation of China Merchants Bank as an Example

Yiting Zhu^{1,a,*}

¹*Shanghai University of International Business and Economics, Shanghai 201620, China*

a. zyt19078034@hotmail.com

**corresponding author*

Abstract: In the era of big data, the integration of financial services and science and technology has become a trend, and financial technology has become critical to the financial service industry. This paper takes China Merchants Bank as a representative case study, summarizes the transformation process of China Merchants Bank business, and sorts out the aspects and transformation measures of China Merchants Bank's use of financial technology. By analyzing the case of China Merchants Bank introducing financial technology to realize the transformation, this paper uses the method of financial index analysis to study the impact of financial technology on the transformation of China Merchants Bank, obtains the impact of financial technology on commercial banks, and puts forward appropriate suggestions. The innovation of this paper is mainly reflected in the research methods and directions. According to the comprehensive literature, there are few cases of domestic and foreign scholars studying the combination of commercial banks and fintech. Therefore, this paper adopts the method of combining theory with practical cases, starting with the promotion of financial technology transformation by China Merchants Bank, discusses the impact of financial technology on the performance of China Merchants Bank, and then gives strategic suggestions for other commercial banks to use financial technology.

Keywords: Financial technology, Commercial bank, Analysis of financial indicators

1. Introduction

1.1. Research Background

As an important part of China's economy, the prompt development of the financial industry has played a positive role in the development of China's overall economy. The prompt development of next-generation technologies such as big data and biometrics has greatly affected the current global financial industry and promoted the integration of finance and technology.

The positive development of Internet finance has led to the enhancement of residents' awareness of investment, and residents are more willing to obtain higher returns through diversified investment methods. Fintech is the booster for commercial banks to increase their scale. Due to the huge financial market in China, commercial banks occupy a very short market share with the new technology of

financial technology. Therefore, fintech has screened out a number of scientific and technological commercial banks with new technological means, which is the development goal pursued by traditional commercial banks. The products and services of commercial banks can be further developed by applying financial technology. This efficient and innovative pattern replaces the traditional operation pattern of heavy asset scale, and can effectively improve its operation efficiency.

1.2. Significance of Topic Selection

At present, many domestic and foreign scholars have conducted in-depth research on the operation mode of commercial banks, and summarized a series of operation modes according to different times and development stages. However, from the current literature, domestic and foreign scholars have less discussion on the case study of the financial technology and commercial banks, and there is a general situation of emphasizing theoretical research rather than case analysis. Therefore, this paper adopts the method of combining theory with case analysis, starts with the promotion of financial technology transformation, compares the financial indicators before and after the introduction of financial technology, and discusses the impact of financial technology on the transformation. It is different from other scholars in research methods and has certain innovation. At the same time, the significance of studying the benefits of fintech for the operation of commercial banks is far from limited to the internal of commercial banks, but can be mapped to the entire financial industry.

2. Literature Review

2.1. Financial Technology

Fintech is defined by researchers as a financial means to sort out and analyze user data and make targeted adjustments based on user needs by using new technologies such as cloud computing and big data [1].

In terms of the impact of fintech, fintech is considered to have two sides. While providing financial convenience to consumers, it may also bring new risks. Therefore, regulators not only need to protect the interests of consumers, but also need to create a safe innovation environment to promote financial stability [2]. Milian [3] also proposed that fintech plays a double-edged sword role in the process of innovative services. In terms of the development trend of fintech, Hu Yuxiao [4] believes that fintech has changed the traditional financial model and accelerated the phenomenon of financial disintermediation. With the development of China's economy, fintech has gradually developed and expanded in China, and the development of fintech in China will become better.

From the research at home and abroad, it can be seen that scholars have two attitudes towards the impact of financial technology: positive and negative. As financial technology is a new industry emerging in recent years, its real and practical impact still needs to be seen in the long run. With regard to the development trend of financial technology, the comprehensive promotion of financial technology, on the one hand, should ensure data security. On the other hand, it should win the trust of users and provide users with high-quality experience, so as to promote the positive role of financial technology in society [5].

2.2. The Impact of Fintech on the Performance of Commercial Banks

On the impact of fintech on the performance and business of commercial banks. The impact of fintech on commercial banks is mainly divided into four aspects: bank payment, impact on loan status, impact on bank profit structure, and big data finance to improve the enthusiasm of bank innovation [6].

In terms of specific performance impact, some scholars believe that the development of financial technology can bring greater positive impact to commercial banks. By comparing the impact of

financial technology on the development of Citibank and Industrial and Commercial Bank of China, Chen[7] believes that financial technology plays a driving role in the development of traditional commercial banks. Wen Meiqin and Cao Li [8] took Ping An bank as a case and analyzed it with the entropy method to draw a conclusion that financial technology innovation has a positive impact on the financial performance of Ping An bank in the past five years, and that the development of financial technology will have a positive impact on the business level of commercial banks.

Other scholars believe that the development of financial technology will have a greater negative impact on commercial banks. McGuire [9] believes that under the impact of the financial technology industry, a large number of commercial banks will be affected or even go bankrupt. In this case, it is necessary to consider the losses and injuries to ordinary customers caused by the collapse of commercial banks. Fintech risks inevitably include the traditional financial risks faced by commercial banks, but at this stage, fintech will increase the risk level of commercial banks [10].

3. Methodology

3.1. Literature Research Method

According to the topic, the paper summarized the results of related research, designed the research and established research objectives through the literature research method firstly. After that, various channels were available for collecting research literature about relevant content divided by topic. Libraries, the information from education institutions and the Internet were used to collect related information. This paper made a literature review on the background of financial technology and the impact of financial technology on commercial banks, sorted out and summarized relevant research, and applied it to the following conclusions.

3.2. Case Study Method

Case analysis and research method referred to the study of a case, in-depth analysis of the causes and measures of the case, summarizing relevant experience, and expanding to other related fields from here to there. This paper chose China Merchants Bank, a representative of Chinese commercial banks, as the object of analysis. This paper analyzed the development history and application occasions of China Merchants Bank's science and technology, and divided the use of science and technology into several parts under the background of big data. From this, the positive and negative impact of financial technology on commercial banks could be seen.

3.3. Financial Index Analysis Method

The financial index analysis method referred to the analysis of index for evaluating the financial situation and operating outcomes of an enterprise, including solvency indicators, operational capacity indicators, profitability indicators and development capacity indicators. This paper studied the impact of financial technology on the performance of Chinese commercial banks, and the performance of enterprises was shown by financial indicators, so the analysis of financial indicators was very important. This paper selected the required financial indicators based on the annual report data disclosed by the enterprise, sorted and analyzed the data to obtain the increase or decrease, trend, etc., and drew relevant conclusions.

4. Results

4.1. Retail Business of China Merchants Bank

Transformation and development process of China Merchants Bank. Looking at the development history, it can be found that so far, China Merchants Bank has focused on retail financial business as the transformation focus of commercial banks, and taken wholesale financial business and interbank business as the secondary part of the transformation, closely combined with the macroeconomic trend and the direction of national economic policies, made rational use of financial technology and improved its competitiveness. In the 14 years from 2004 to 2018, China Merchants Bank has experienced two important and successful transformations. From 2019, China Merchants Bank officially entered the third stage of the transformation of "fintech bank". The specific strategic directions of the three transformation stages are shown in the Table 1.

Table 1: Stage of transformation and development of China Merchants Bank.

Stage	Time	Strategic direction
First transformation	2004-2009	Focus on retail business, build a retail bank, and replace passbook with one card
Second transformation	2010-2013	Form differentiated competition in retail business and deepen the transformation of retail assets
Deepening of the second transformation	2013-2018	Firmly promote the strategic direction of "one body, two wings" and "light bank"
Third transformation	2019-now	"User + technology" main line, open integration, and build a <u>fintech</u> bank

Comparison of China Merchants Bank Retail Business with the same industry. This paper selects the financial data at the end of 2017 as the time point for the comparison of Chinese commercial banks in the same industry. The four major state-owned commercial banks, the postal bank, the Bank of communications and the top joint-stock banks were selected as the comparison objects. Compare the specific conditions of these banks' retail asset business, retail loan business and retail intermediary business in 2017. See Table 2 for detailed data.

Table 2: Retail business of commercial banks in 2017.

Unit: 100 million yuan

	Retail deposit business	Retail loan business	Retail intermediary business
CMB	13385.22	16940.05	640.18
ICBC	80688.94	42305.87	1396.25
ABC	92465.10	40002.73	729.03
BOC	58312.28	39238.57	1448.89
CCB	70784.89	45377.03	1177.98
BOCM	15772.73	14098.82	410.61
PSBC	68614.04	31023.54	127.37
SPDB	4813.72	11510.67	455.80
CNCB	5334.38	12315.84	516.87
CEB	4441.79	7504.82	330.25

From the retail deposit business, loan business and intermediary business of the same industry of commercial banks, the retail business balance of the four major state-owned banks is relatively large, while among joint-stock commercial banks, China Merchants Bank is far ahead. Although the retail deposit business of China Merchants Bank still lags behind that of state-owned commercial banks, on the whole, China Merchants Bank is in a dominant position in the retail business of the same industry.

4.2. Financial technology strategy of China Merchants Bank

Financial technology development process of China Merchants Bank. China Merchants Bank is currently in the 3.0 stage of fintech. The development of fintech of China Merchants Bank has experienced three stages. In April, 1998, China Merchants Bank launched the online banking product One net connect, marking that China Merchants Bank has entered the stage of fintech 1.0 - IT technology. In December, 2012, China Merchants Bank launched mobile payment tools, marking that China Merchants Bank has entered the stage of fintech 2.0 - Internet finance. In December, 2016, China Merchants Bank had released intelligent investment advisory products, marking the third stage of financial technology.

The current financial technology development strategy of China Merchants Bank is the third change of China Merchants Bank to the retail business of commercial banks. This change is the retail financial reform that makes the retail business from bank card to APP platform. The APP platform is the platform that China Merchants Bank can best reflect the achievements of financial technology, and can integrate many financial technology contents. The specific APP strategy started with the launch of *China Merchants Bank APP7.0* and *Palm life APP7.0* in September, 2018. For the client side, *China Merchants Bank APP7.0* focuses on the development of retail financial business, providing daily user financial transactions, mobile payment, etc., while *Palm life APP7.0* is a centralized retail life service, providing full coverage of users' financial consumption. For the back end, the support of the two APPs is financial technology support, which organically combines the core technologies of financial technology such as big data and blockchain, providing possibilities for front-end user financial and life retail services.

Analysis of the impact of fintech on China Merchants Bank. Fintech will bring dual impacts to commercial banks, but in general, the positive impact of fintech on China Merchants Bank is more significant. Through the analysis of the transformation of China Merchants Bank, three aspects of impact are thought to be brought by fintech on China Merchants Bank .

Improve risk control capability. The essence of the operation of commercial banks is the operation of risks. As the largest joint-stock commercial bank in China, China Merchants Bank has no exception. How to enhance the risk control ability and reduce the non-performing asset ratio is also the goal it has been pursuing in the process of transformation.

Big data means help reduce credit risk and operational risk. The centralized sorting of massive big data enables China Merchants Bank to accurately analyze the basic situation of users, understand their consumption behavior and repayment ability, and decrease the moral hazard and adverse selection caused by information asymmetry through the sharing of credit investigation data. From the results, it is effective for China Merchants Bank to introduce financial technology to improve its risk control ability. The non-performing loan ratio of China Merchants Bank has risen from 2014 to 2016, and has gradually declined since 2017. On the whole, the non-performing loan ratio of China Merchants Bank has been effectively controlled, and its risk control ability has been significantly improved.

Improve the ability of getting customers. Before the introduction of fintech transformation, China Merchants Bank had a relatively single access to users, mainly by opening online stores. However, the cost of opening new outlets was high and the work efficiency was low, which also limited the

coverage of users. After China Merchants Bank proposed the transformation, it adopted new financial technology such as big data and artificial intelligence, developed two APPs, expanded online channels, and obtained most young user groups. Moreover, online banking services covered a wide range, and access to customers would not be limited by geographical factors.

From the results, the use of financial technology by China Merchants Bank has provided strong support for the improvement of its customer acquisition ability. Since China Merchants Bank implemented the transformation strategy, from 2014 to 2020, the cumulative number of credit cards issued has increased by nearly 40million, and the number of private bank customers has increased by nearly three times. China Merchants Bank's customer acquisition capacity has been significantly improved, which is mainly due to China Merchants Bank's mastery of financial technology.

Innovate financial services. In the process of transformation of China Merchants Bank, fintech mainly helps innovate the content of financial services through new technological means. China Merchants Bank uses big data analysis to accurately analyze target users, conduct cross-border cooperation, and launch many joint bank cards. Relying on artificial intelligence and big data, it accurately pushes marketing content and analyzes user portraits in the background, which improves the efficiency of financial services. At the same time, AI will constantly learn user preferences, store a large number of user behavior preference portraits, and help China Merchants Bank adjust product differences and improve decision-making efficiency.

As a result, the number of retail users of China Merchants Bank increased from 56 million in 2014 to 158 million in 2020, an increase of nearly three times. This shows that the innovation of financial services has effectively increased the number of retail users and laid a solid foundation for the improvement of their profitability.

4.3. Analysis of the Impacts of Fintech on China Merchants Bank

Analysis of asset structure indicators. Since 2014, China Merchants Bank has started the second transformation guided by the "light bank". In fact, the establishment of light bank is also the initial attempt of China Merchants Bank to integrate technology into finance. It can be found from the Fig.1. that China Merchants Bank's use of financial technology has led to its retail loans rising and accounting for an increasing proportion of the total loans. The main source of this phenomenon is the introduction of financial technology. Relying on technology, China Merchants Bank has effectively reached retail users and increased the number of retail customers according to Fig.2. From 2014 to 2017, the proportion of retail loans of China Merchants Bank in total loans increased sharply, and then maintained steady growth from then on to 2020. The transformation strategy of China Merchants Bank and the application of financial technology have significantly improved its asset structure.

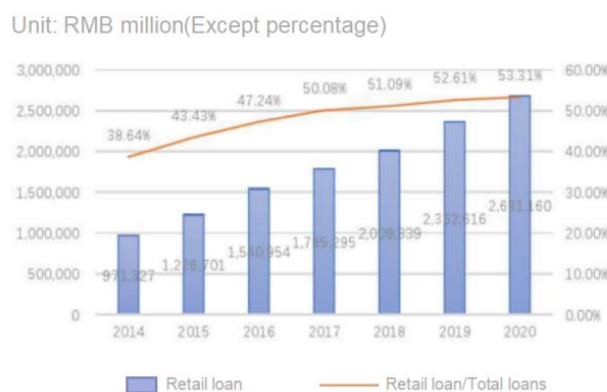


Figure 1: China Merchants Bank 2014-2020 retail loan amount and its total loan.

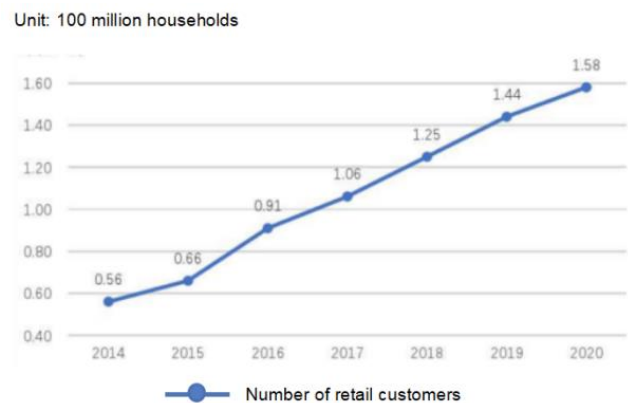


Figure 2: Total retail users of China Merchants Bank from 2014 to 2020.

Analysis of income structure indicators. Improving the profit model of interest margin can effectively reduce the capital pressure of commercial banks and realize the steady development of commercial banks. This paper selects non interest income indicators and operating income indicators to measure the transformation effect of China Merchants Bank.

As shown in Fig.3, China Merchants Bank's non interest income has increased year by year since 2014, and doubled in 2020. The proportion of non interest income in total revenue and total assets is also basically on the rise, which shows that non interest income has gradually become an important module of the income structure of China Merchants Bank, and retail finance, which generates non interest income, has become an important business in the profit model of China Merchants Bank.

From the perspective of the transformation stage, during this period, China Merchants Bank reasonably absorbed the new ideas of financial technology and vigorously expanded its retail financial business. From 2014 to 2020, the cumulative number of cards issued by China Merchants Bank increased by nearly 40million, and the number of private bank customers increased by nearly three times. These retail financial businesses effectively drove the rise of non interest income.

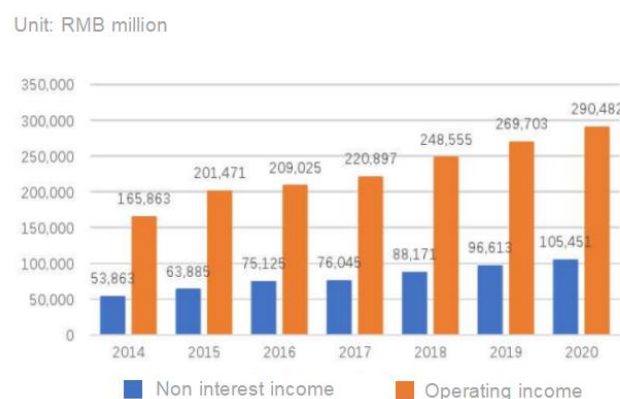


Figure 3: China Merchants Bank 2014-2020 non interest income and operating income.

Analysis of profitability index. The ultimate goal of stabilizing the core competitiveness of retail finance is to enhance profitability and expand profit space. Therefore, in order to measure the overall operating efficiency of the transformation of China Merchants Bank, this paper selects the relevant financial indicators of profitability for analysis.

As shown in Fig.4, the ROE of China Merchants Bank decreased steadily from 19.28% in 2014 to a sharp decline in 2016 and reached a historical low of 15.73% in 2020. From the perspective of financial data, the use of its own capital is not effective enough, and the rate of return has also been in a downtrend. From the perspective of ROA, the index has been floating around 1.2% during the transition period of China Merchants Bank. For the NIM, the interest income of its credit assets is relatively stable, and has been maintained at about 2.5%. It can be seen that at the present stage, the profitability has not been greatly enhanced, but has remained at a stable level.

Through the comparison of financial data, we can make it clear that the transformation of China Merchants Bank has not greatly improved its profitability. This is also closely correlated to the economic environment. In this time, the worldwide macroeconomic downtrend, strong competitiveness of commercial banks, and the impact of the epidemic have hampered the transformation impact. But at meantime, the transformation of China Merchants Bank has maintained its original market share, which is also the advantage brought by fintech to China Merchants Bank. China Merchants Bank is right to combine the advantages of fintech with its own market characteristics. Although the impact is not significant, it is generally effective.

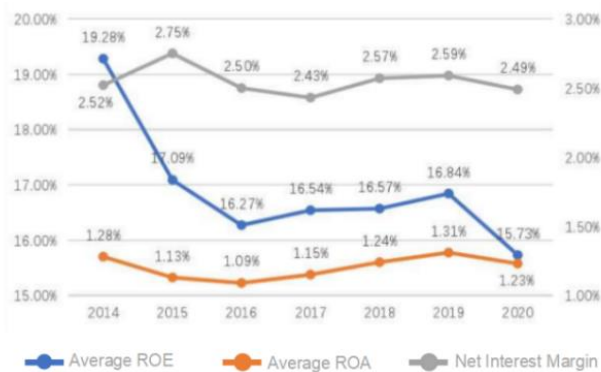


Figure 4: China Merchants Bank 2014-2020 income indicators.

5. Discussion

This paper sorts out the literature and current situation of the impact of fintech on the performance of commercial banks, and believes that there exists a certain correlation between fintech and the performance of commercial banks. Therefore, this paper selects China Merchants Bank, a representative bank with well-developed financial technology and retail business, as the research case. Through the introduction of the business of China Merchants Bank and the application of fintech, and the analysis of the corresponding financial indicators, it can be seen that China Merchants Bank has achieved great success in the transformation of fintech, which has certain reference significance for other commercial banks to introduce fintech for transformation.

However, there are still some differences in the absorption of financial technology by various kinds of commercial banks, because diverse types of commercial banks have different basic systems and management modes, which will affect the effectiveness of financial technology. And the data analyzed in this paper is still not comprehensive enough, and the selection of data is relatively limited. Therefore, commercial banks should also clarify their own advantages and disadvantages in the process of learning from the transformation of China Merchants Bank, and effectively introduce financial technology, rather than blindly use financial technology.

For commercial banks to use financial technology to promote business conditions, this paper puts forward various suggestions. First, specify the financial technology-based strategy. Increase investment in this area, and entirely combine fintech with the transformation strategy. Besides,

improve financial technology-based risk control. This is not only beneficial to the establishment of a good operating system of commercial banks, decreasing the bad performance of commercial banks, but also beneficial to the completion of the transformation of commercial banks.

6. Conclusion

This paper aims to study the correlation between fintech and the operating conditions of commercial banks through literature collection, case analysis and research, as well as financial index analysis. It is concluded that fintech plays a driving role on the performance of commercial banks. Although the effect is not significant, it is generally effective. Based on the research and conclusions of this paper, more research on commercial banks with different business models also needs to be carried out in order to get more accurate and complete conclusions. At present, Chinese commercial banks have entered the process of system electronization, and will move towards a new stage of management and service in the form of fintech in the future. In the context of the new normal of international economic development, Chinese commercial banks must also further improve their organizational structure, effectively meet multi-dimensional needs with more digital means, pave the way for the comprehensive upgrading of commercial banks, and provide strong support for the healthy, stable and rapid development of China's financial industry.

References

- [1] Dapp T. *Fintech—The digital evolution in the financial sector*[R]. Deutsche Bank Research, 2014.
- [2] Jagtiani J, John K. *Fintech: The Impact on Consumers and Regulatory Responses*[J]. *Journal of Economics and Business*, 2018(100):1-6.
- [3] Milian E Z, Spinola M, Carvalho M D. *Fintechs: A literature review and research agenda*[J]. *Electronic Commerce Research and Applications*, 2019(5):14-18.
- [4] Hu Yuxiao. *Research on the impact of fintech on commercial banks and its development and transformation*[J]. *Economist*, 2022,05:102-103.
- [5] Harrison, Stewart, Jan, et al. *Data security and consumer trust in Fintech innovation in Germany*[J]. *Information & computer security*, 2018,26(1):109-128.
- [6] Yu Jia, Yuan Yuning. *On the influence of financial technology on commercial banks and Countermeasures*[J]. *Chinese market*, 2019,05(2):41-47.
- [7] Chen. *The Transition from Traditional Banking Mobile Internet Finance*[J]. *Financial Innovation*, 2017(1):1-16.
- [8] Wen Meiqin, Cao Li. *Research on the impact of fintech on the financial performance of commercial banks -- a case study of Ping An Bank*[J]. *Market Weekly*, 2019,03(2):83-85.
- [9] McGuire, W. *Adaptive Financial Regulation and Regtech: A Concept Article on Protection for Victims of Bank Failures*[J]. *Duke Law Journal*. 2016(66):567-604.
- [10] Guo Lihong, Zhu Keda. *Fintech, bank risk and business performance: from the perspective of Inclusive Finance*[J]. *International Financial Research*, 2021(7):56-65.
- [11] Philippon T. *The FinTech Opportunity*[J]. *NBER Working Papers*, 2016(3):22-23.