



Analysis on the Development of Financial Technology and Its Impact on Commercial Banks in the Era of Big Data

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Abstract. Financial technology is a new technology that uses a series of technological innovations such as big data, cloud computing, artificial intelligence and blockchain to empower the financial industry, improve operating efficiency and reduce operating costs. As the foundation of financial technology, big data, combined with other emerging technologies, is widely used in six financial fields, including payment and clearing, loan financing, wealth management, retail banking, insurance and transaction settlement. Fintech has probably gone through three stages of integration, and finally derived four core parts: big data finance, artificial intelligence finance, blockchain finance and quantitative finance. This paper studies the impact of financial technology on commercial banks by using the methods of literature retrieval, data comparison and case analysis.

Keywords: Financial technology · commercial banks · big data · artificial intelligence

1 Introduction

By June 2021, the number of Internet users in China had reached 1.011 billion, an increase of 21.75 million over December 2020, and the Internet penetration rate had reached 71.6%. As a new form of financial business based on data technology, financial technology has the unique characteristics of openness and virtualization, which greatly reduces the threshold for the development of financial products and services and the development of financial business, and changes the existing financial pattern and form. By studying the development of financial technology, we can further reveal the impact of big data, cloud computing, artificial intelligence, blockchain and other technologies on the application scenarios in the financial field, which is of great significance.

Financial technology refers to the financial innovation brought by technology. It can create new business models, applications, processes or products, which will have a significant impact on the financial market, financial institutions or the provision of financial services. Financial technology businesses are classified according to economic functions, including payment and settlement, deposit and loan and capital raising, market facilities, investment management and insurance. Then, with economic functions as the

Table 1. Financial technology business classification.

Economic function	Field	Business
Payment settlement	Retail / wholesale payment	Mobile and online financial services
		Cross border payment
		Digital currency
	Financial market infrastructure	Distributed account based payment system
Deposits and loans and capital raising	Deposit and loan	Lending platform
	Capital raising	Equity crowdfunding
Market facilities	Cross industry general service	Digital ID verification
		E-aggregator
		Smart contracts
	Technology infrastructure	DLT
		Big data
	Cloud computing	
Investment management	Robo-advisors	Wealth management
	Electronic transaction	
Insurance	Wearables IOT	
	Smart contract	

traction line, the existing financial technology businesses can be divided into cross-border payment, digital currency, lending platform, equity crowdfunding, wealth management Big data, cloud computing and other business forms (see Table 1 for details).

2 Characteristics of Financial Technology

2.1 Original Advantages of Financial Technology

The original advantage of financial technology is its natural attribute and the fundamental factor for its development in the financial market. Strong technical attribute is the natural advantage of financial technology. Compared with the stagnant technology research and development of traditional commercial banks, financial technology enterprises have always played the role of technology leaders [4]. And we are committed to customer-centered financial technology that uses iterative upgrading thinking to update products and services. On the track of finance, I didn't intend to drive to surpass from the beginning, but created a new track by taking advantage of technology. At the same time, the virtualization characteristics of products and services enable fintech to realize the online operation of financial products and services through the form of network in the process of integration with commercial banks, and more refined operation of a large

number of offline outlets to compete for customer resources. With the empowerment of financial technology, the marginal cost of commercial banks is decreasing, but the marginal profit is increasing.

2.2 Derivative Advantages of Fintech

The derivative advantage of financial technology is the spillover effect of connecting social resources and an important factor for its sustainable development in the financial market. In the early stage of the development of financial technology, the scale effect of population is one of the capital that financial technology enterprises can rely on in seeking survival and development, that is, by gathering the platform effect brought by huge users, we can explore and extend more possible profit models on this basis. At the same time, with the large-scale popularization of intelligent mobile terminals in recent years, the derivative advantages of financial technology are more obvious: the online platform cuts into each user's life scene, obtains the precipitation data generated by the user's use of the platform, and comprehensively evaluates the customer attributes by using the user's multi-dimensional data. In contrast, the customer data of traditional commercial banks are mostly generated from transaction data.

3 Development Stage of Financial Technology

For financial technology, which emphasizes that technology drives financial innovation, it is actually rushing forward with the continuous integration of Finance and technology. The control of scene risks related to the acceleration, enhancement and matching of the pursuit of value circulation is the driving force of the integration of Finance and technology. From a global perspective, the development of financial technology has probably gone through three stages of integration of Finance and technology. It mainly includes: IT stage, Internet plus stage and technology plus stage.

3.1 IT Stage

The financial industry mainly realizes the basic electronic information storage and integrated authority management through the IT system built inside the traditional financial institutions, establishing and managing the enterprise department's own database, so as to improve the efficiency and security of the financial industry. The products at this stage, from well-known POS machines and automatic teller machines (ATMS) to bank capital trading system, credit management system and clearing system, are the result of IT in the financial industry.

3.2 Internet Plus Stage

With the upgrading of various intelligent terminals and network communication systems, the global Internet has ushered in an era of explosion. A large number of individuals, units and enterprise users began to access the Internet. The huge user group has become the so-called "traffic" pursued by Internet enterprises in this period. At this time, the thinking of

the integration of Finance and science and technology also reflects the characteristics of “flow”. While obtaining a large number of registered users and maintaining rapid growth, a large number of new Internet enterprises began to rely on their own distribution platform channels to provide huge exposure for the subsequent development of new products and new businesses. What follows is that the potential of the personal consumption market has been released unprecedentedly, that is, the so-called long tail effect. Various Internet plus just unfolding new financial forms, including Internet payment, P2P lending, consumer finance, equity crowd financing, Internet Fund and Internet trust, are transforming the traditional financial business channels with the power of the Internet.

3.3 Technology Plus Stage

With the breakthrough and maturity of technologies such as artificial intelligence, big data, cloud computing and blockchain, a new round of global information revolution has gradually opened. This transformation is no longer like the IT stage, which is limited by data transmission and download operation by simple internal network server built by traditional financial institutions, and it will not be like Internet plus. It will only be Internet based traditional financial business, and it will be faced with server crashes caused by the skyrocketing traffic. The rapidly growing number of servers not only brings problems that are difficult to manage, but also consumes a lot of manpower, capital and energy. It also threatens the security of financial data due to the backward management of computer room access rights. “Science and technology+” stage is to change the current situation, solve various business problems and deficiencies, and put forward more in-depth and extensive solutions under the condition of mature breakthrough of existing technology. This enables financial efficiency to achieve another significant improvement. And there have been forms of high-tech embedded financial products and services such as Internet banking, quantitative investment, big data risk control, supply chain finance and so on.

4 Impact of Financial Technology

4.1 Impact on the Intermediary Status of Commercial Banks

In the traditional financial system, commercial banks have always been positioned as financial intermediaries. On the one hand, commercial banks shoulder the responsibility as payment intermediaries, undertake the collection and payment transfer of funds, and complete the payment and settlement, so as to reduce the transaction cost and risk. On the other hand, as the intermediary of capital financing, it can realize the connection between the capital supplier and the capital demander, and effectively reduce the risk caused by the information asymmetry between the borrower and the borrower. However, with the continuous development of financial technology, the original intermediary role of commercial banks has been gradually weakened and replaced by the online transaction settlement platform of financial technology enterprises. The intelligent means of financial technology makes the lending process easier. And financial technology makes use of network means to make all transaction data be presented in real time and accurately. This is because fintech enterprises can link many merchants to realize the great

enrichment of users' consumption scenes, so as to change users' payment habits. At the same time, the online migration of the traditional mode of capital financing can realize the direct connection between the network of capital supply and demand. This has greatly improved the so-called information asymmetry, reduced intermediary costs and reduced transaction costs. Therefore, the emergence of financial technology has a great impact on commercial banks, which use information asymmetry to make profits.

4.2 Impact on the Traditional Business Philosophy of Commercial Banks

In the traditional business ideas of commercial banks, they hope to realize income through large-scale investment, which is a typical extensive operation mode. In this case, the main source of operating income of commercial banks is the net interest margin, but the net interest margin is highly related to the benchmark interest rate to a large extent, which makes the profitability of commercial banks largely depend on the whole macro policy. In recent years, the accelerated process of market interest rate has had a great impact on the profitability of the whole commercial banks [3]. Commercial banks urgently need to make a breakthrough in non interest income. The rise of Internet financial enterprises has exacerbated the profit pressure of commercial banks. The asset light mode of Internet financial enterprises and the accurate delivery of products and services have put great pressure on commercial banks. Commercial banks urgently need to change this business development idea of exchanging quantity for quality.

At the same time, the explosive growth of financial technology in recent years has gradually changed the consumption concept of social groups. Personalization, intelligence and simplicity have become the basic demands of users when experiencing financial services. In this regard, China's commercial banks are very passive, and the transformation of ideas and talent training lag behind. Both the overall business ideas of commercial banks and the ideas of the grass-roots banks for products and services are constantly impacted by financial technology and affect the whole financial market.

4.3 Impact on the Profit Model of Commercial Banks

In the traditional profit model of commercial banks, the main operating income comes from net interest income. Relying on its special position in the financial system, commercial banks carry out credit activities, payment and settlement activities, and obtain a large number of financial data of individual and enterprise users. However, the rise of financial technology is gradually breaking this situation. It can use technical means to erase the profit space brought by information mismatch, and guide more individual and enterprise users to the platform of emerging financial technology enterprises. Subsequently, the customers of commercial banks are continuously diverted, the transaction data decreases, and the overall cost of bank credit activities will also rise. The subsequent credit rating for customers, product matching and marketing of related products and services will form pressure. At the same time, for commercial banks, payment business has always been the bank's low-cost fee income, and can precipitate transaction data at the same time. The emergence of financial technology makes the payment means of third-party payment and other platforms change with each passing day, which is convenient and safe, leading to the loss of customer base of commercial banks. The deposit in the

Table 2. The stages of artificial intelligence development.

Year	2019	2020
Total number of outlets	228420	226712
Number of transformed business outlets during the year	15591	12856
Number of community outlets	7228	5580
Number of small and micro networks	3272	2206

original deposit loan relationship chain of commercial banks will face a great impact. At the same time, the cumbersome and high threshold of loan audit by commercial banks makes a large number of small loan demanders flow to the small loans provided by financial technology enterprises.

The emergence of financial technology has brought a great impact on the traditional profit model of deposit, loan and exchange of commercial banks for a century, forcing commercial banks to try to reform their profit model and reduce the number of offline outlets year by year (as shown in Table 2). Correspondingly, online transactions have increased year by year. According to the 2020 China banking service report released by the China Banking Association, the number of off counter transactions of banking financial institutions reached 370.872 billion in 2020, a year-on-year increase of 14.59%; The total volume of off counter transactions reached 2308.36 trillion yuan, a year-on-year increase of 12.18%; The average diversion rate of electronic channels in the industry is 90.88%. Among them, mobile banking transactions reached 191.946 billion, a year-on-year increase of 58.04%, and the total transaction volume reached 439.24 trillion yuan, a year-on-year increase of 30.87%; Online banking transactions reached 155.030 billion, with a total transaction volume of 1818.19 trillion yuan, a year-on-year increase of 9.68%; Telephone banking handled 862 million calls manually; The average connection rate of manual telephone is 93.04%.

5 Development of Banking and Financial Technology

5.1 System Technology Upgrading to Further Optimize the Risk Control of Commercial Banks

The extensive commercial application of financial technology to big data, cloud computing, artificial intelligence and blockchain will provide experience and technical support for the system technology upgrading of commercial banks. For China's commercial banks, in today's highly information society, the application of modern information technology has great advantages in solving the problems of China's commercial banks in customer information management, product and service launch, risk control and so on [2].

Commercial banks will usher in an important window of opportunity in the modernization of financial information brought by financial technology. First, in terms of bank customer information management, a large amount of customer data, including its

transaction browsing data, need a lot of human and material resources to process, and the application of big data cloud computing will save a lot of human and material costs; Secondly, by learning from the systematic and iterative way of launching products and services of fintech companies, the characteristics of low efficiency and light experience in the development of products and services of commercial banks will be changed; Thirdly, the risk control of traditional commercial banks has been conservative and inefficient. The establishment of modern information collection and processing system will change the current situation of bank risk control in the future.

5.2 The Application of Big Data Finance Has Improved the Level of Financial Services

In China, commercial banks have always put the bank first in the planning of products and services or dealing with business problems for a long time, ignoring the needs from the market and customers. The needs of customers can only meet their functional requirements to a large extent, and the evaluation of service and operational experience has always been low. Of course, banks are also constantly putting forward the business objectives of improving service level and customer satisfaction, but the key is that due to the traditional administrative management system of commercial banks and the management thinking still stays on the traditional bank business ideas, the realization process and method are lack of rationality, and it is conceivable that the effect is not good. The emergence of financial technology brings user-oriented product and service concept [1]. Its unique internet thinking of openness, connection, sharing and cooperation has subverted the business philosophy of the traditional financial industry.

China's commercial banks will also usher in a rare opportunity to change their business ideas in the reform brought about by financial technology. Firstly, fintech's user-oriented product service concept will well solve the experience problem of bank products and services; Secondly, providing Internet-based thinking that draws lessons from financial technology will make commercial banks no longer look for banks for customers, but automatically connect with customers. This will make the overall business thinking of commercial banks to a higher level for customers, both in business and management.

5.3 Online and Offline Integration Expands New Marketing Channels

For commercial banks, the promotion of products and services and the accessibility of customers need to rely on marketing channels. In the past, the marketing methods of China's commercial banks mostly used offline outlets to find customer resources and promote financial products and services, and more used e-marketing, SMS and instrumental online banking channels. The traditional marketing model is not only limited in scope, but also has poor effect, and even affects the user experience. The emergence of financial technology makes the market realize that the efficiency of the original marketing method provided by the Internet can achieve amazing point touch, and can achieve the effect of real-time feedback at the same time [5].

With the large-scale rise of financial technology, the thinking of commercial banks is also quietly changing. Major commercial banks have adjusted their business forms

and vigorously developed online banking. At the same time, they have realized the service of online and offline docking, and the marketing channels have also migrated from the traditional offline physical channels to the Internet. The rapid development of financial technology largely relies on the neglected network channels with a lot of attention in the past for marketing, so as to obtain a large number of customer resources to achieve rapid development. As major commercial banks have invested in building online banking, their innovation and transformation in marketing channels will usher in important opportunities.

6 Conclusion

Since the development of fintech, fintech, which has always been driven by science and technology, has subverted the traditional financial model with the support of technology, so that the channel advantages built by China's commercial banks in many outlets in the past have been almost erased, and may even become a burden. This brings the dual pressure of asset quality and horizontal competition to China's commercial banks. However, the technical level, business ideas and business model of fintech will provide an important reference for the transformation of commercial banks. For China's commercial banks, this will be an important opportunity for transformation in the new era.

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