

Research on the Relationship Between Financial Technology and Economic Innovation of State-Owned Banks Under the Technology Integration Model

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Abstract—With the gradual development of science and technology, financial technology research has quickly become a hot topic in economic innovation research, and financial technology will affect the economic innovation and development of the financial industry. Based on this, this research first establishes a technology integration model based on existing data. Secondly, it analyzes the impact of financial technology represented by artificial intelligence, blockchain, cloud computing, and big data on state-owned banking businesses, and explores the newness of financial technology. A round of business development injected the latest business modules and how to promote the economic innovation of state-owned banks. Finally, this study uses SPSS to analyze the financial technology development data of state-owned banks to explore the root causes of economic innovation. It also proposes a development strategy for building an economic innovation ecology for future banks and an innovation system that integrates financial technology and scenarios.

Keywords—financial technology; technology integration model; blockchain technology; economic innovation

1 INTRODUCTION

With the rapid development of information technology, the Party Central Committee and the State Council attach great importance to the integration and application of the Internet, big data, artificial intelligence, blockchain, 5G, and other new-generation information technologies, and have deployed them from the national strategic level many times [1]-[4]. The Fifth Plenary Session of the 19th Central Committee of the Communist Party of China, which closed on October 30, adopted the "Proposals of the Central Committee of the Communist Party of China on Formulating the Fourteenth Five-Year Plan for National Economic and Social Development and the Long-term Goals for 2035". "Innovation" and other related financial technology planning have made a special discussion [4]. Therefore, the development of financial technology is an important direction for the development of various industries.

Under the epidemic situation, the world structure is undergoing microsecond changes, and its impact on the financial and technological fields is unpredictable [2], [6]. In traditional information technology and new information technology, subject to core technologies and technical standards, my country is facing huge challenges [7]. With the help of mobile Internet technology, customer consumption habits and lifestyles are changing, large commercial banks have weakened their volume advantages, small and medium-sized banks rely on online

channels to attack flexibly, and inter-industry competition is becoming increasingly fierce [1],[2], [8]. Innovative technology has become a powerful weapon for a decisive victory in the digital age. By introducing new technologies, helps to quickly launch new applications, or enhance the technological strength of enterprises to realize indirect value [3], [5]-[6], [9]. Regardless of the value-form of new technologies, it has become the consensus of state-owned commercial banks to enhance financial competitiveness through new technologies [8], [10]–[13]. Therefore, financial technology has a very important impetus for the development of state-owned banks. Therefore, this study selects the six major state-owned listed banks to conduct a comparative study on the development of state-owned banks through the empowerment of financial technology. It aims to point out the current state-owned banks' financial technology development status and future development trends and provide theoretical and practical value for the future development and deployment of financial technology of other types of banks.

2 LITERATURE REVIEW

Financial Technology (FinTech) is a technology-driven financial innovation. The core is that licensed financial institutions use modern scientific and technological achievements to transform or innovate financial products, business models, and business processes under the premise of compliance with laws and regulations to promote financial development to improve quality and efficiency [14].

The development path of financial technology with blockchain as the value traction. From Internet crowdfunding to digital asset trading, the UK has always been relying on the concept of distributed development to development finance. The characteristics of blockchain decentralization, smart contracts, and non-tamperability can protect the security of Internet crowdfunding customers' funds [6]; digital currency can avoid P2P counterparty credit risk. In 2018, the British Ministry of Finance, the Financial Conduct Authority, and the Bank of England jointly formed the "Encrypted Assets Special Working Group". In the same year, the British government issued a series of regulatory measures on the blockchain industry. In addition, the Bank of England established a distributed clearing system [6]. The United States is most typical of big data analysis and artificial intelligence applications, and it is trying to explore the regulatory sandbox [9], [15].

3 RESEARCH METHOD

This study selects the 2020 annual reports of the six state-owned banks of Industrial and Commercial Bank of China, Agricultural Bank of China, China Construction Bank, Bank of China, Bank of Communications, and Postal Savings Bank. The researchers use content analysis to standardize the selected literature materials into quantitative Data, and based on these data to make a quantitative analysis of the content of the literature and make judgments and inferences about the facts. The 2020 annual report analyzed by this research is released from the official websites of various state-owned banks, which have a certain degree of reliability and research value.

4 CONSTRUCTION OF THE RESEARCH MODEL OF STATE-OWNED BANK FINANCIAL TECHNOLOGY

The researcher analyzed the data related to the financial technology research of the six state-owned banks, and finally put forward the basic elements and main technologies of a total of seven types of technology and financial integration models. The technology mainly includes artificial intelligence technology, big data technology, cloud computing technology, blockchain technology, audio, and video technology, Internet of Things technology, and new technology + research. Researchers sorted and classified according to the technology, and constructed a state-owned bank financial technology research model, as shown in Figure 1.

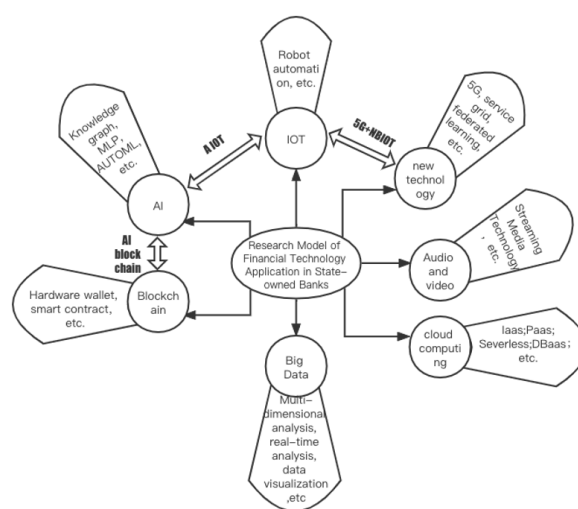


Figure 1 Technology integration model

5 THE RELATIONSHIP BETWEEN STATE-OWNED BANKS' FINANCIAL TECHNOLOGY AND ECONOMIC INNOVATION

5.1 Artificial Intelligence Technology

As shown in picture 2. With the "Postal Savings Brain" as the core, the Postal Savings Bank has initially established a bank-wide machine learning platform to realize the intensive management of AI resources such as data, computing power, and models [17]. "The Bank of China has built a group enterprise-level artificial intelligence platform by building the "BOC Brain" project based on artificial intelligence technology [18]. In 2018, the Industrial and Commercial Bank of China and artificial intelligence unicorns cooperated to develop an artificial intelligence platform Prophet [19], The operation of these innovative systems that integrate financial technology is the result of financial business innovation in the state-owned industry. But state-owned banks will also integrate the application of technology, such as

Bayesian formula $P(A/B)=P(B/A)*P(A)/P(B)$ to integrate big data technology and artificial intelligence technology in the expansion of the bank's latest business[20].

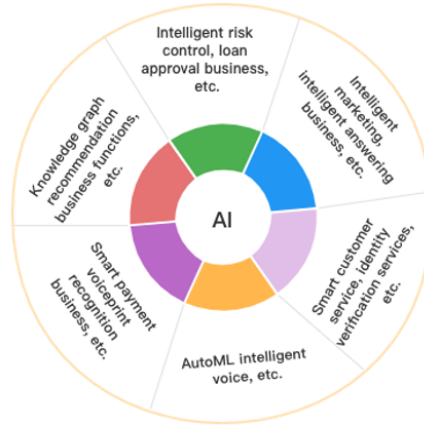


Figure 2 Business diagram of artificial intelligence banking

5.2 Cloud computing technology

All state-owned banks' research on cloud computing is based on cloud-based technology platforms to form information-sharing, effectively achieve business innovation and development, and promote the secondary development of the economy. Based on the "CCB Cloud", China Construction Bank creates flexible financial-level infrastructure supply capabilities [7], [20]. The cloud computing project of the Bank of Communications system operation and maintenance service is a very important project [16]. The average number of concurrent users processed most frequently in these cloud computing projects is the formula of $c=nL/T$ and the peak number of concurrent users. This is the process of cloud computing. The foundation of auxiliary business innovation is also the foundation of promoting the innovative development of new economic models.

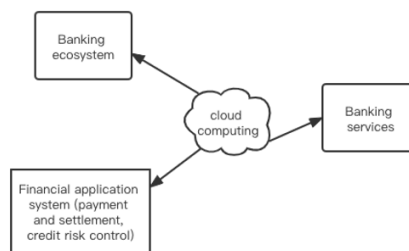


Figure 3 Cloud computing banking business diagram

5.3 Big data technology

The big data technologies used by state-owned banks maiAll state-owned banks currently apply big data technology. The big data application support capability of China Construction Bank has played an important role in digital operations [20]. The Bank of China big data application

platform fully integrates internal and external data of the group, provides convenient and diverse data services to the whole bank [21], and supports massive data analysis and value mining [18]. Industrial and Commercial Bank of China uses the self-developed "Rogan e-trust" big data anti-fraud system to help customers prevent telecom fraud [19].

5.4 Blockchain technology

The application of blockchain in the financial field has always attracted the attention of the banking industry and researchers, as shown in Figure 4. Nowadays, the banking and financial industry is one of Hengye with the largest number of blockchain technology landing projects and the richest scenarios [11]–[13], [22], [23]. For example, credit investigation and risk control. All state-owned banks are integrating blockchain technology in the development of the financial industry. The Bank of China is actively developing innovative technologies in Xiongan New District and other places, conducting basic research, and launching blockchain bond issuance projects in the business content [18]. In 2020, China Construction Bank will expand blockchain technology to innovate in cross-border trade and smart government affairs [20].

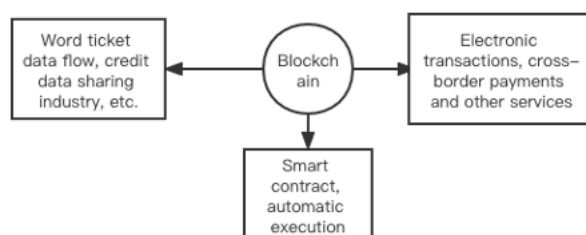


Figure 4 Blockchain banking business diagram

5.5 Audio and Video Technology

Industrial and Commercial Bank of China, Bank of China, Postal Savings, China Construction Bank, and Bank of Communications currently do not conduct research and application on audio and video technology. Only the Agricultural Bank of China operates audio and video technology. For non-bank customers, it uses streaming media technology to launch a business processing channel that uses corporate banking as the entrance and remote video as the main service method to help the construction of remote banks [8].

5.6 Internet of Things Technology

In 2020, China Construction Bank will access more than 200,000 IoT terminals on its IoT platform, and the IoT ecosystem has begun to take shape. For the Internet of Things and 5G, a physical management system for cash and important items based on the Internet of Things technology will be built. Bank of Communications' current research on robotic automation is not reflected in the report, as shown in Table 6; Bank of China develops robotic automation technology products [18]. The Internet technologies of other banks are developed in conjunction with other technologies.

5.7 New technology

All banks have perfected the application of 5G+ smart products. However, the Agricultural Bank of China uses its new technology. The practice of the Agricultural Bank is based on the current most active service grid open-source project Istio, which has been tried out on the Diting platform [8]. Through the construction of a management plane, the grid parameter configuration is integrated into a modular, scene-based function output, so that Service mesh can be used more safely, standardized, and conveniently. At present, the evaluation of the FATE open-source framework and Aegis federation learning framework has been completed. Taking the “digital operator” project as a starting point, ABC explored a set of integrated cloud-side solutions based on artificial intelligence Internet of Things (AIoT) [8].

5.8 Fintech investment

Through the use of SPSS descriptive statistical analysis, as shown in Figure 5. Researchers can find that in terms of financial technology, the six state-owned banks are still at the forefront, their investment amount is huge, and the importance of state-owned banks on financial technology is constantly increasing. And most banks see through the continuous introduction of financial technology talents.

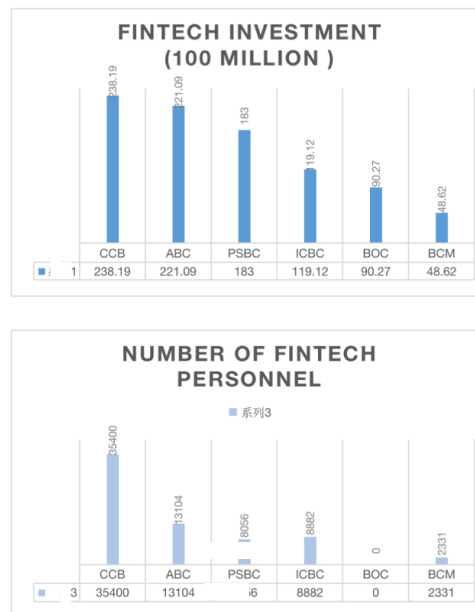


Figure 5 Descriptive statistical analysis

6 CONCLUSION

The development of financial technology in banks is mainly reflected in the digital capabilities of state-owned banks. All state-owned banks have applied artificial intelligence technology, cloud computing technology, big data technology, blockchain technology, and 5G technology.

First, for the application on the debit side, all state-owned banks use financial technology to build platform-based finance to reduce their operating costs. Second, all banks use blockchain technology for asset-side research. These new technologies can help revitalize The role of rural finance, and use financial computing technology to promote economic innovation and development, and form certain strategic policies. Finally, all state-owned banks have certain practical research on the use of blockchain technology on the payment side. Blockchain technology can solve the problems of many intermediate links and the high cost of cross-border payment [12], [22].

This research believes that to promote the development of financial technology and economic innovation models of banks, state-owned banks must first build a new economic ecology for future banks, combining the economic form of the Internet, platform operation, online operation, and flow operation "Internet financial service system. Finally, the integrated development of financial technology and scene finance has made inclusive finance such as micro-business finance, consumer finance, and supply chain finance its core business.

The limitation of this research is the content analysis method research carried out by a researcher, but the researcher tries his best to analyze the data on the basis of the truthfulness and fairness of the research data and draw research conclusions. Researchers believe that future research can continue to explore the relationship development model of financial technology for all commercial banks.

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