

Research on the Development of Data Application under the Background of Financial Technology

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Abstract: In the context of the rapid development of digital economy, how can the financial sector make effective use of data as a production factor, solve the problem of information asymmetry between financial institutions and "long tail customers", improve the efficiency of data application, strengthen the protection of the legitimate rights and interests and privacy of information subjects, and give better play to the important value of data in promoting economic and financial development, It is worthy of in-depth research.

1 INTRODUCTION

The Fourth Plenary Session of the 19th Central Committee of the Chinese Party Central proposed to improve the mechanism that labor, capital, land, knowledge, technology, management, data and other production factors contribute by market evaluation and determine remuneration according to contribution. This is the first time that Chinese Party Central Committee proposed to take data as a production factor to participate in income distribution, which reflects the keeping pace with the times of the basic socialist economic system under the background of the rapid development of digital economy. It is a major theoretical innovation. In the financial field, the People's Bank of China has built credit investigation system with financial data. On this basis, using non-financial data other than financial data to solve the problem of information asymmetry between financial institutions and "long tail customers" is of great significance for giving play to the basic role of data in leveraging financial resources and serving inclusive finance. Therefore, in the current era of big data with the rapid development of financial technology, based on the pilot establishment of data exchanges in some regions, the financial field tries to use cloud computing, blockchain, internet of things and other technologies to further break the non-financial data barriers, but it also leads to a series of problems such as excessive use of data and infringement of the legitimate rights and interests of data subjects. How to effectively and

reasonably apply data as a production factor under the background of financial technology is worthy of in-depth research.

2 CURRENT SITUATION OF DATA APPLICATION UNDER THE BACKGROUND OF FINANCIAL TECHNOLOGY

We strongly encourage authors to use this document. With the accelerated breakthrough and application of new generation data technologies such as cloud computing, big data, blockchain, internet of things, industrial internet, 5G and artificial intelligence, human society has ushered in the era of digital economy after agricultural economy and industrial economy. In 2020, the scale of Chinese digital economy will reach 39.2 trillion yuan, ranking second in the world, accounting for 38.6% of Chinese GDP. It is expected that the proportion of digital economy in Chinese GDP will exceed 50% by 2025. Making good use of data resources, strengthening the mining of data value and giving full play to the role of data as a key production factor will effectively promote the high-quality development of Chinese economy.

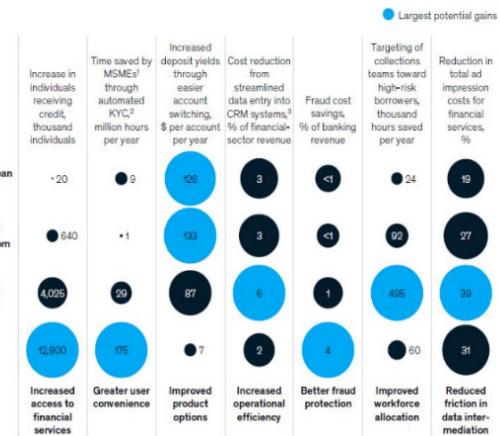
Table 1: The scale of Chinese Internet development.

Year	Digital Economy	Electronic Commerce	Internet of Things	Artificial Intelligence
2020	39.2 trillion	37.2 trillion	1.7 trillion	303.1 billion
2019	35.8 trillion	34.8 trillion	—	—
2018	—	31.6 trillion	1.2 trillion	33.9 billion

Data sources: China Internet development report 2021, China Internet development report 2020, China Internet development report 2019.

Under the background of financial technology, the financial field has become one of the earliest and most widely used fields of data resources. After the People's Bank of China built the credit investigation system with financial data to help credit risk control, the financial field began to further mine non-financial data in order to improve the ability to prevent and control credit risks. This trend is basically the same as that of developed countries. The United States first proposed and applied non-financial data in the financial field. Especially after the rapid development of financial technology, a large number of non-traditional standard data outside the financial field are cleaned, sorted and processed by technical means and applied to prevent and control credit risk in the financial field. This phenomenon is regarded as the breakthrough application of "non-traditional data" in the United States. Since then, non-traditional standard data has been widely used in the development of all walks of life. In China, the value mining of data, especially non-traditional standard data, is mainly concentrated in a number of service industries such as finance, retail, clothing, food, housing and transportation, and its application in agriculture and industry is still in its infancy. In other words, the data application in the financial field is exploratory, which is mainly reflected in the following aspects:

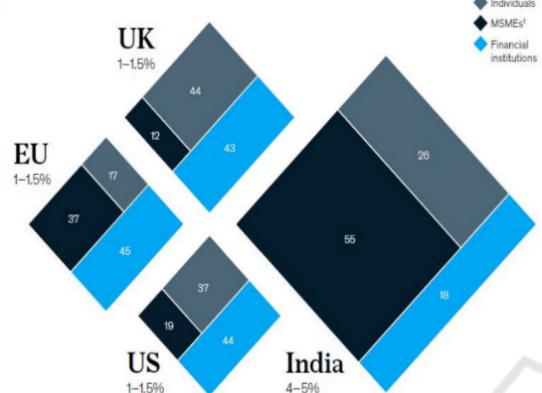
First, help the financial institutions to achieve precision marketing, by accurately classifying customers through existing customer behavior data, and predicting credit preferences of different types of customers, so the financial institutions can conduct more targeted marketing, recommend more suitable financial products to customers, and improve marketing efficiency. In addition, data application also can help the financial institutions to reduce ineffective costs in traditional marketing methods, and improve customer satisfaction. Second, after being provided data support for the development of intelligent credit products, the financial institutions can accurately match the customer credit amount and interest rate for different types of customers, implement low interest rate for low-risk customers and high interest rate for high-risk customers, and carry out automatic marketing and lending, so as to effectively shorten the customer loan time and reduce the manual input cost in the credit process. Third, effectively prevent and control credit risk. For example, in terms of anti fraud, compare existing customer data to identify possible fraud by using the advanced technology of big data, and mark more suspicious fraud clues such as identity forgery by applying desensitization data shared among financial institutions through blockchain and other technologies.



Sources: McKinsey, The value of open data for individuals and institutions.

Figure 1: Potential Gains from Open Data for Finance by 2030.

However, the support level of data application in the financial field in different countries is different, and the data application modes are also different among countries. In addition, there are great differences in the value generated by data application due to the differences in market conditions, the robustness of digital financial infrastructure and regulations.



Sources: McKinsey, The value of open data for individuals and institutions.

Figure 2: Potential GDP Impact by 2030 by Broad Attribution to Market Participants, % of GDP.

On June 24, 2021, McKinsey released the research report Financial data unbound: The value of open data for individuals and institutions. Combined with the actual situation of different economies such as the European Union, India, the United States and the United Kingdom, the report analyzes the main mechanisms and values of opening and sharing financial data. According to the report, by 2030, the wide use of opening data ecosystem in the EU, the UK and the United States, may promote the economy as high as 1.5% of GDP, and India may be as high as 4% to 5%. However, due to the lack of breadth of data sharing in the European Union and the lack of standardization of financial data in the United States, the potential value that the United States and the European Union can obtain from financial data is expected to less than 10%; The UK's data ecosystem is more perfect, but the breadth of data sharing is still not enough. The potential value that can be obtained is expected to account for 30-40%; India's data aggregator provides a high level of standardization and wide sharing for sharing data, enabling India to obtain 60% - 70% of the potential value from financial data. In other words, for emerging economies, due to the current low level of financial access and financial depth, the credit needs of individual business and enterprises have not been

met. With the more data application in the financial field, the possibility of obtaining loans has been improved. Once these economies obtain loans and put them into production and operation, every unit of real capital will be increased, it will bring greater economic growth potential, and create great value. As a developing country, China has huge data that can be used as a production factor and applied in the financial field. At present, on the premise of the legitimate rights and interests protection of data subjects, we need to seize the opportunity of the rapid development of financial science and technology, make more data resources and create more economic value in the financial field, and make finance truly serve economic development.

3 PROBLEMS EXISTING IN THE DATA APPLICATION IN THE FINANCIAL FIELD

3.1 After Data Became a Production Factor, the Constraint of Data Application Has Increased

The application of massive data has subverted the traditional credit risk control mode and efficiency in the financial field. Financial institutions obtain customer data authorization by signing agreements for credit risk control, and use the data to post loan management and other links of credit activities. More and more non-traditional standard data has been applied in inclusive finance. It enterprise financing and the internet finance have gradually expanding the scope of financial services to "long tail customers" without credit data, increasing the loan availability of them, and effectively promote the in-depth development of the financial market. However, after data becomes a production factor, customers also put forward more demands on the ownership and even derivative value of their own data, by requiring stricter standardization and management of data. If the data is applied arbitrarily in the financial field without restriction and its economic value is obtained by the financial institutions, the legitimate interests of the data subject will be damaged, especially when the data is applied without authorization and consent, which will affect the feasibility of data application. Therefore, the data application in distribution as a new production factor also puts forward higher compliance and value-added requirements for data flowing, sharing, trading and other behaviors in the financial field (Chang 2018).

3.2 The Data Standard Has Not Been Established, Which Reduces the Efficiency of Data Application

At present, the data application in finance field is carried out by financial institutions relying on their own credit system, and the credit system among different financial institutions have different structures, that will result in some differences in the application processes such as data acquisition and cleaning. In particular, the data acquisition boundary has not been unified, and some small financial institutions with weak risk control capabilities are at the stage of blind obedience in data application, and a large number of useless data are added to the scope of application. On the one hand, the accuracy and efficiency of data application may be reduced, resulting in rights protection events. On the other hand, the structure and continuity of data is very important for the efficient and beneficial of data analysis, if a large number of fragmented and unstructured data is incorporated into the application scope, the corresponding work links such as collection, calculation and cleaning will lead to a significant increase in the cost of data application. The fragmented and unstructured of data may also lead to the change or disappearance of many signals hidden in the data over time, and that will change the accuracy of the model.

3.3 The Algorithm Opacity Brought by Technology will Affect the Data Application

The most distinctive feature of digital economy is taking data as the key production factor, participating in wealth creation, adopting the operation mode of "data + algorithm + product", and finally tending to be "intelligent" form. The data application in financial field, such as credit scoring, often based on the data model of complex calculus, that will lead to the lack of explicability of the application methods, and unequal treatment or discrimination in financial services (Ba, Hou, Tang, 2016). In addition, fragmented data often lacks historical records, and can not be accessed publicly, so it is difficult to carry out backtracking test, which also challenges the accuracy of data application. And due to the different data application methods among different financial institutions, some data are collected and accessed in real time, some data are stored regularly by technical means, that will result in uncertainty and low economic efficiency of data application.

3.4 Credit Agencies May Bring New Independent Credit Risks

With the rapid development of financial technology, credit agencies, relying on their technical advantages such as data mining, begin to collect and process various behavior data in a comprehensive, multi angle and multi-level manner, and as the risk control party, to attract customers and provide credit services for financial institutions, such as providing suggestions of credit decision, sharing a part of credit profits and bearing a part of credit risks. With the gradual refinement of social division of labor, the technical advantages of credit agencies become more prominent. However, with the deeper and deeper involvement of credit agencies in credit business, especially when their role changes from the provider of data to the processor of data products for financial institutions, and even replaces the credit risk control role of financial institutions, a series of independence risks will be caused by interest conflicts. Especially if the financial institutions only bear a small part of the credit business risk, and most of the risk is borne by government departments or guarantee companies, the financial institutions will reduce their input costs in data collection, processing and other links as far as possible from the perspective of driving profit, and rely on credit agencies to make credit decisions (Ye 2015).

4 POLICY SUGGESTIONS ON DATA APPLICATION IN THE FINANCIAL FIELD

Financial technology is a double-edged sword for data application, which needs to be treated dialectically. We should not only recognize its advantages in expanding traditional data sources, but also recognize its disadvantages in personal privacy and data security, so as to give better play to the value of data as a production factor in promoting economic and financial development.

4.1 Strengthen the Protection of the Legitimate Rights of Data Subjects

First, improve legislation. Personal Information Protection Act, Data Security Act, Data Transaction Rule and other laws, clarify the rights and obligations of data, infringement form and compensation system of data, and realize the legal using of data and the rights protection of the data subjects. Especially in the

context of trade internationalization, we should pay attention to the data application of the process of cross-border data flow. For example, increase the research on data opening and sharing, actively participate in the research and formulation of international rules, promote the legislation of cross-border data flow, and strengthen the classified management and risk assessment of cross-border data. Second, make full use of financial technology to protect the business secrets and privacy of data subjects. Build a complete and effective data security guarantee system and data management system to ensure the security of the whole life cycle of data, such as data collection, processing, using and sharing. For example, use the blockchain technology to make the data exchange between nodes follow a fixed algorithm, ensure data security and the privacy of data subjects from the underlying technical architecture, and solve the problem of trust between nodes. At the same time, improve the data authorization and objection handling mechanism, and strictly protect the credit rights and interests of data subjects, such as the right to know, the right to objection, the right to correction and the right to repair.

4.2 Promote the Establishment of the Right Confirmation and Pricing Mechanism of Data as a Production Factor

First, clarify the data property rights. Explore and improve the data property rights identification rules according to the characteristics of data generation conditions and processing methods, establish a perfect data transaction mechanism on the basis of clear property rights, and build reasonable transaction rules and equity distribution model, establish a trading market of all kinds of data, promote the smooth flow and efficient application of data in the financial field, and give play to the important role of data in improving productivity and promoting economic development. Second, improve intellectual property protection. Effectively ensure the innovative development of data mining, analysis, modeling and other technologies, and promote the effective transformation of data resources into data products, which support the development of information economy. Promote professional data application institutions such as credit agencies to play a more important role in collecting market transactions and other economic activity data, encourage them to participate in the collection, transaction and application of data, provide better credit investigation

products for enterprises and farmers, and promote the healthy and vigorous development of digital economy (Pian, Xie, 2020).

4.3 Clarify the Data Collection and Application Standards

First, promote the standardization of data collection. In view of the different of formats and quality of unstructured data, establish a unified data collection and processing mode, strengthen the anonymization and de identification of data, ensure the scientificity and unity of data collection, and prevent differential discrimination caused by data processing or infringement of the rights and interests of data subjects (Yang, Tian, Liu, 2021). Second, establish a unified data application specification according to the risk characteristics presented by the type and application of data. Establish a new application mode composed of computer related technologies such as point-to-point transmission, distributed storage, consensus mechanism and encryption algorithm. In this mode, distributed data storage generates interconnected data blocks and stamped with time stamps to form an open and transparent time series chain and improve the efficiency of data application (Talin, Li, 2018). Third, strengthen the construction of financial infrastructure. Promote the interconnection of various infrastructures, give play to the advantages of financial infrastructure in data circulation and security protection. And on this basis, research and demonstrate the establishment of a data sharing center or the pilot of financial data sharing relying on the existing system to promote the security protection and open utilization of financial data (Ju, Zou, Fu, 2018).

4.4 Strengthen the Supervision of Data Application in the Financial Field

First, credit agencies establish independent system of department, personnel and salary. Credit agencies should establish a clear internal organizational structure and a responsible firewall system, ensure the collection of customer information, the design of risk model and other credit departments are independent of other departments such as business marketing, and ensure that the compensation of credit department personnel is not related to the scale of financial institution credit business. At the same time, credit agencies shall establish an independent compliance department to supervise the compliance status of credit reporting department and personnel. Second, financial institution should deeply

participate in the whole process of designing the risk control mode, and negotiate with credit agencies on key elements such as specific data items and model weighting coefficient of risk control model. Especially when the defect rate of credit business exceeds a certain value, both parties should find out the cause in time and adjust the model parameters. Third, financial institution should independently carry out secondary risk control. The risk control function of credit agencies can not completely replace the offline investigation and secondary risk control of financial institution. Financial institution should make independent credit decisions on the basis of comprehensive analysis of the credit reports provided by credit agencies and Credit Reference Center of The People's Bank of China, and comprehensive understanding of the actual business situation of customers, so as to reduce the dependence on the credit agencies.

5 CONCLUSIONS

At present, the data application in Chinese financial field is still in its infancy, but with the rapid development of financial technology, data application will usher in explosive development. The improvement of data subjects' awareness of their own rights and interests protection, the lack of data application standards, the opacity of application algorithms, and the independence of professional data application institutions such as credit agencies will become obstacles to the development of data application. Therefore, we propose to strengthen the protection of the legitimate rights and privacy of data subjects by improving legislation and scientific and technological support, protect data property rights by establishing the right confirmation and pricing mechanism of data, promote the security protection and open utilization of financial data by clarifying the data collection and application standards, and ensure the independence and effectiveness of data application in the financial field by increasing supervision.

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