ISSN 2706-6827 Vol. 3, Issue 11: 61-66, DOI: 10.25236/IJFS.2021.031110

Construction of Intelligent Risk Control System for Commercial Banks in the Era of Big Data

Meilian Ge

Department of Economics and Management, Taishan University, Tai'an 271000, Shandong, China
gemeilian@163.com

Abstract: *With the widespread application of mobile Internet, cloud computing, Internet of Things and social networks, human society has entered a new information age of "big data". The future of bank credit also depends on big data. Big data risk control relies on big data to establish models, and uses big data model monitoring to fully reveal risks, so as to achieve the role of risk prevention. In the actual development process, commercial banks should actively adopt big data technology to improve the relevant intelligent risk control system, constantly improve the intelligent level of risk control, and lay a solid foundation for their subsequent development.*

Keywords: *Big data technology, commercial banks, Intelligent risk control system*

1. Opportunities and Challenges Faced By Commercial Banks in the Era of Big Data

Big data, in short, is to get better decisions and clearer results from massive and diversified information through data processing. As a financial intermediary, the essence of commercial banks is to undertake and manage risks. With the acceleration of the process of global financial integration, the operating environment of banks is increasingly complex, and the risks they face are further increased, which puts forward higher requirements on the risk management ability. In this context, commercial banks should seize the opportunity, make full use of big data, artificial intelligence and other technologies to innovate the traditional risk control mode, and establish an intelligent risk control system covering the whole process of risk identification, measurement, analysis and disposal, so as to comprehensively improve the risk prevention and control ability of banks. Compared with traditional risk management and control technologies of banks, big data technology has certain advantages and can better help banks manage and control risks. The advantages of big data risk control are mainly reflected in the following aspects

1.1. It Can Better Realize Risk Prediction

In the process of risk control, data plays a very important role, especially user data, such as user identity information, assets and liabilities, trading information, etc., are the key data information for risk control in the banking industry. By analyzing existing credit risk events through big data technology, banks can judge the basic behavior of users, which plays a critical role in credit practice. Big data risk control of the main advantage is that it can use technology to make risk prediction, and the huge database if the database information is false, it is difficult to determine whether there is a real risk, but if rely on big data to data collection and analysis, can effectively avoid the situation.

1.2. It Is Helpful To Innovate the Mode of Risk Management and Control

In the process of their own development, commercial banks adopt big data technology to create a risk control system, which is conducive to the innovation of related risk control work mode, the transformation of traditional risk control means, and the innovative implementation of all aspects of work. First of all, the adoption of big data technology by commercial banks can enrich the dimension and density of data analysis, enhance the credibility of risk models, and ensure the effective implementation of risk prevention and control in all aspects. Secondly, data flow calculation method and real-time data analysis method can be adopted to enhance the timeliness of data information in the constructed risk control model, and the future development trend of risks can be predicted through real-time feedback method. Finally, the use of big data technology can also accurately identify all kinds of risk management information and prevention and control information, and transform the risk

ISSN 2706-6827 Vol. 3, Issue 11: 61-66, DOI: 10.25236/IJFS.2021.031110

prevention and control knowledge into business rule information and model content to ensure the effective implementation of the overall work. In addition, in the process of using big data technology, it can also comprehensively analyze various factor data and dimensional data content, reduce the technical threshold of risk control, and continuously enhance the effectiveness and reliability of all aspects of work.

2. Big Data Risk Control Mode of Commercial Banks

2.1. Data Access Management

Big risk control management needs to implement data acquisition channel management, data access vendor management, configuration management, data interface subscription management, interface log management, and other functions, through the data access external risk and regulatory data, to help commercial Banks to establish a unified external data access entry and inline data distribution channels, build up the interconnection mechanism with external data.

2.2. Data Modeling

Analyze data through modeling. Data contains a lot of customer information, including strong characteristics and weak characteristics. For example, gender, age, place of birth, education level, income level and so on are strong characteristics; The evening drink Coffee, often in the morning and late at night, is a weak sign. Big data risk control must establish a financial risk control model to find out whether there is a correlation between different characteristics and default. By obtaining data such as default probability of customers, we can determine the credit status of users, and then decide whether to provide financial services and the interest rate of loans.

2.3. Establish a Big Data Service Cloud Platform

In order to cope with the challenges of risk control of banks in the era of big data, banks need to establish a cloud platform of big data service for risk management. In this way, credit risk, asset risk, operational risk and market risk can be better controlled, and risk control can also be incorporated into cloud management, so as to improve the quantification of bank risk data and the bank's ability to apply the data. Specifically, first of all, banks need to establish a big data cloud storage space and build a basic database and index database to achieve the quantification of risk data. Secondly, data extraction, analysis and solution are realized through big data technology. The processing time is shorter, the data processed is more stable, and the bank can use the data at any time. Finally, the risk management model of banks is optimized and upgraded through big data. Through big data, the risk model and related management in the current bank can be processed, so as to realize the interconnection and sharing of the data.

3. The Future Trend of Bank Credit in the Era of Big Data: Big Data + Machine Intelligence Credit Investigation

Many banks in China have begun to try to drive business operations through big data. For example, China CITIC Bank's credit card center uses big data technology to realize real-time marketing, China Everbright Bank has established a social network information database, and China Merchants Bank has used big data to develop small and micro loans. From the perspective of development trend, the application of big data in banks can be generally divided into four aspects:

3.1. Application of customer portrait

The application of customer portrait is mainly divided into individual customer portrait and enterprise customer portrait. Personal customer profile includes demographic characteristics, consumption ability data, interest data, risk preference, etc. The enterprise customer portrait includes the production, circulation, operation, finance, sales and customer data of the enterprise, as well as the upstream and downstream data of the relevant industrial chain. It is worth noting that the customer information banks have is not comprehensive, and sometimes it is difficult to draw ideal results or even wrong conclusions based on their own data. Banks should not only consider the data collected from their own business, but also consider integrating more external data to expand their understanding of

ISSN 2706-6827 Vol. 3, Issue 11: 61-66, DOI: 10.25236/IJFS.2021.031110

customers. Include:

(1) Customer behavior data on social media. For example, China Everbright Bank has established a social network information database. Through the integration of the bank's internal data and external social data, a more complete customer puzzle can be obtained, so as to carry out more accurate marketing and management.

(2) Transaction data of customers on e-commerce websites. For example, China Construction Bank combines its e-commerce platform with credit business. Alibaba Finance provides unsecured loans to Alibaba users, who only need to rely on their past credit.

(3) Upstream and downstream data of the industrial chain of enterprise customers. If the bank grasps the upstream and downstream data of the industrial chain in which the enterprise is located, it can better grasp the development of the external environment of the enterprise, so as to predict the future situation of the enterprise.

(4) Other data that is conducive to expanding the bank's interest in customers, such as the behavior data of Internet users from the DMP data platform that is emerging in the online advertising industry.

3.2. Risk control

Includes the small and medium-sized enterprise loan risk assessment and the fraudulent transaction identification and so on means.

(1) Risk assessment of loans to small and medium-sized enterprises. The bank can conduct loan risk analysis through the enterprise's production, circulation, sales, finance and other relevant information combined with big data mining method, quantify the enterprise's credit limit, and more effectively carry out loans to small and medium-sized enterprises.

(2) Real-time fraudulent transaction identification and anti-money laundering analysis. The bank can use cardholder basic information, card basic information, transaction history, customer historical behavior pattern, ongoing behavior pattern (such as transfer) and so on, combined with the intelligent rule engine to carry out real-time transaction anti-fraud analysis. For example, IBM's financial crime management solution helps banks use big data to effectively prevent and manage financial crimes, while JPMorgan Chase uses big data technology to track criminals who steal customer accounts or hack into automatic teller machines (ATM) systems.

3.3. Operation Optimization

(1) Market and channel analysis and optimization. Through big data, banks can monitor the quality of different marketing channels, especially network channels, so as to adjust and optimize cooperation channels. At the same time, it can also analyze which channels are more suitable for promoting which types of bank products or services, so as to optimize channel promotion strategies.

(2) Product and service optimization: Banks can transform customer behavior into information flow, analyze customer's personality and risk preference, understand customer's habit at a deeper level, and analyze and predict customer demand intelligently, so as to carry out product innovation and service optimization. For example, Industrial Bank is currently conducting a preliminary analysis of big data, distinguishing high-quality customers through payment data mining, and providing differentiated financial products and services according to the difference in the amount of repayment of customers.

4. Suggestions on Building Intelligent Risk Control System of Commercial Banks Based on Big Data Technology

In the context of big data, commercial banks should actively build an intelligent risk control system and give full play to the positive role of big data technology. Specific measures are as follows:

4.1. Broaden the Access to Data and Information

Intelligent risk control system based on big data is a system based on data, with risk control model as the tool and risk indicators as the basis for decision-making. Intelligent risk control systems use data to manage risks, so data availability, data quality and data processing capabilities are critical.

ISSN 2706-6827 Vol. 3, Issue 11: 61-66, DOI: 10.25236/IJFS.2021.031110

(1) Integrate internal data and strengthen data governance. China's commercial banks have a large number of customers, including customer account information, agreement information, transaction information and other high value-added data, which has a high business value. However, due to historical reasons, data is often scattered in multiple systems, lacking standardization and unified standards, and problems of poor data quality, weak management and difficult sharing are common. In order to meet the data requirements of the intelligent risk control system, all the data in the bank should be integrated, the data base should be unified, the data governance should be strengthened, and the data quality should be improved.

(2) Introducing external data and integrating internal and external data. In the era of mobile Internet, commercial banks should establish the concept of data sharing, seize the favorable opportunity, actively expand external data sources, and realize the effective supplement of internal and external data. The current external data mainly includes risk list information, long loan and overdue information, important data collection information and so on. The external data can be introduced in a variety of flexible forms such as purchase, cooperation and joint development. There are many dimensions of external data, in order to improve the value of data, it should be effectively integrated with internal data, unified management, to achieve internal and external data sharing and centralized management.

(3) Set up a data platform to support data closed-loop management. Intelligent risk control system needs to integrate, analyze and apply massive data and information, and needs to build a supporting platform supporting the data-oriented closed-loop system of "collection, analysis, use and feedback", which involves data storage and management, analysis and mining, scenario-based application, feedback evaluation and other links. The data platform should be able to break through the performance bottleneck of traditional data computing, timeliness and complexity of indicators and other problems, with high performance, high reliability and complex computing capabilities.

4.2. Create a Perfect Risk Control Work Model

Model is the "soul" of intelligent risk control. Commercial banks use simple or complex models to constantly improve their own intelligent perception and response ability, and then assist or replace manual labor to improve the level of risk control. At present, intelligent risk control models mainly fall into the following categories.

(1) Assisted the bank in making risk decisions through the judgment and matching of simple rules, such as information verification, black and white list matching, face recognition, etc. Under the premise of data availability, such models are not difficult to implement, and the rules are simple and reusability is high. However, rule creation depends on expert experience and the fact of existing risks, so it cannot be automatically updated for new risk modes.

(2)Use the data mining algorithm to summarize and analyze the large amount of customer-related data and external data accumulated by the bank, so as to improve the accuracy of risk control. Commonly used data mining algorithms include multiple logistic regression, cluster analysis, neural network, decision tree, association analysis, etc., such as the use of neural network model to achieve customer credit risk evaluation. This kind of model continuously optimizes and adjusts the model through training the model, and has a qualitative improvement in the model accuracy and applicability.

(3) Using new technologies and means such as machine learning and knowledge graph to dynamically analyze credit risks and fraud risks, establish a dynamic decision-making mechanism and risk control model to improve the accuracy and efficiency of decision-making. For example, by adopting machine learning technology, fraudulent transactions can be automatically identified from data, and transaction patterns can be summarized to improve the detection rate of bank fraud and anti-money laundering detection system. Through continuous self-improvement and self-optimization, such models can automatically identify new risk patterns and enhance the rapid response capability of the risk control system.

In order to ensure that commercial banks adopt big data technology to build a sound intelligent risk control system, a relatively perfect risk control work model should be created to form an intelligent perception effect. In the specific work, big data technology should be actively adopted to build a sound risk control work model, enhance the perception ability of commercial banks in risk prevention and control, and effectively complete the tasks of risk prevention and control in all aspects. First of all, in the practical work of routine information inspection technology, face recognition technology as the foundation, to cooperate with the big data mining algorithm, after the input related data information, effective summary, induction and analysis, in the meantime, should actively use the neural network

ISSN 2706-6827 Vol. 3, Issue 11: 61-66, DOI: 10.25236/IJFS.2021.031110

model, different users in the effective evaluation of commercial bank credit risk, enhance the accuracy of the risk assessment, analysis, Optimize the working mode of all aspects. Secondly, knowledge graph technology should be actively adopted in practical work. Based on relevant risk control models, a sound dynamic decision-making system should be established to dynamically evaluate whether there is fraud risk or external risk.

4.3. Improve the Function of Scene Fusion

Banks will embed the knowledge generated based on big data analysis into all areas of risk management, such as credit risk, operational risk, fraud risk, etc., and establish a proactive prevention, full-scene, three-dimensional intelligent risk control system.

(1) Credit risk prevention and control. The source of credit risk is the information asymmetry between borrower and borrower. The main problem to be solved in credit risk prevention and control is how to understand customer information more accurately, comprehensively and clearly, reduce the degree of information asymmetry, and make correct decisions accordingly. At present, widely used credit risk prevention and control applications include customer portrait, intelligent approval, intelligent collection, risk early warning and so on. Among them, customer portrait uses big data and knowledge graph technology to establish a comprehensive customer information review system to measure customers' repayment ability and willingness to repay, so as to display customers' risk characteristics in a panoramic manner and provide technical support for refined customer management.

(2) Operation risk prevention and control. Operational risk is the risk caused by internal operating procedures, personnel, systems, or external events, such as money laundering, internal personnel operating errors, etc. In terms of internal employees operating risk monitoring, in the accumulation of internal loss data and the introduction of external loss data, on the basis of using big data technology for risk monitoring of employee management behavior, by monitoring personnel through timely identification and verification of real-time early warning information and statistical analysis, reveals the corresponding risk and disposal and resolve in time, It improves the pertinence, effectiveness and timeliness of risk monitoring.

(3) Fraud risk prevention and control. In recent years, the number of financial fraud incidents has been increasing year by year. The division of labor within the fraud gangs has become more and more sophisticated, and the anti-investigation ability has become more and more professional. The fraudulent behaviors also show the characteristics of diversity, complexity and concealment. Financial fraudsters seek improper interests by concealing and fabricating important information and creating the illusion of information asymmetry. Traditional risk control system subject to data and information asymmetry, anti-fraud effect is not ideal, but smart risk control system, through the data and technological advantages to found a clue to find more features, mining the user's behavior characteristics, user correlation characteristics of abnormal events, IP, such as mobile phones, location dimension analysis of potential fraud risk, can greatly improve the efficiency and ability of fraud.

Commercial banks adopt big data technology to build an intelligent risk control system, so they should ensure that they respond according to the actual situation within various risk scenarios. In the process of building intelligent relevant risk control system, the function of the fusion should be actively set the scene, strengthen the inner driving force, on the one hand, should be in the design review of customer information system, intelligent identification of customer information, to carry out the work of examination and approval and the risk early warning work, easy to prevent credit risk of the problem. On the other hand, the internal risk supervision and management mechanism should be improved to effectively solve the internal risk problems and ensure the effect of risk prevention and control work.

5. Conclusion

Banks are credit businesses, and the power of data is particularly critical and important. In the era of "big data", represented by the Internet in the modern information technology, especially the portal website, community BBS, weibo, WeChat the vigorous development of the new mode of transmission, such as mobile payment, search engines, and wide application of cloud computing, build up a new system of virtual customer information, and will change the modern financial operation mode. The characteristics of big data, such as mass quantification, diversification, rapid transmission and value, will bring new challenges and opportunities to the market competition of commercial banks. In the age of data, the wise will survive. The bank credit in the future will win the future from data and gain

ISSN 2706-6827 Vol. 3, Issue 11: 61-66, DOI: 10.25236/IJFS.2021.031110

stability from risk control. Commercial banks should actively adopt big data technology measures, build intelligent risk control system, improve risk identification ability, monitoring ability and response ability, effectively prevent potential risks and hidden problems, ensure that the risk problems of commercial banks can be avoided fundamentally, and give full play to the positive role of big data technology.

References

[1] Mei Chongxiu. The construction of bank intelligent risk control system under the background of big data [J]. Chinese and foreign entrepreneurs, 2020 (06)
[2] Chen Zhenhua. Research on the construction of bank intelligent risk control system based on big data technology [J]. Times finance, 2021 (2)
[3] Sun Jifeng, Liu Gaofeng. Correlation analysis between big data and risk management optimization of commercial banks [J]. Regional financial research, 2017 (10): 24-27
[4] Yang Fan. Research on improving the risk control system of commercial banks under the background of big data [J]. Big data era, 2018 (3): 21-23
[5] Wu Ming. (2016). Existing problems and countermeasures of bank information security in the era of network big data. Computer Knowledge and Technology (6X), 42-44.