

# Research on Financial Risk Assessment Based on Artificial Intelligence

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**Abstract.** The effective application of artificial intelligence (AI) models in various fields in the field of financial risk can improve the speed of data processing, deepen the degree of data analysis and reduce the labor cost, thus effectively improving the efficiency of financial risk control. The application of AI in the field of financial risk management puts forward new requirements for the system setup and operation mode of financial supervision. With the rapid growth of computer and network technology, the increase of market transaction frequency, the diversification of data sources and the development and application of big data, it brings new challenges to financial risk management based on massive data. Based on this, this paper analyzes the role of AI in promoting the reform and growth of the financial industry, and puts forward some countermeasures for rational use of AI in the field of financial risk management.

**Key words:** Artificial intelligence; Financial risks; Big data

## 1. Introduction

In the new era of the continuous growth of modern science and technology, modern science and technology have been paid more attention and widely used in various fields [1]. In the financial field, the application of technology has formed a brand-new AI, and the combination of finance and technology has brought people a brand-new financial cognition. Although the growth of AI has brought many unpredictable risk factors to the financial field, its novel way has also been widely concerned and recognized. With the growth of financial industry and the integration of Internet technology, a large amount of data information generated in financial transactions has been effectively retained, which virtually provides the possibility for the application of nonparametric statistical method in Internet financial risk control [2]. With the continuous improvement of social informatization level, financial traders need to understand and deal with more financial information so that they can make more reasonable investment strategies and carry out effective financial risk management [3].

In the information era, the rapidly rising big data processing technology, open-source and complementary wide-area algorithms, Shannon theory and Moore's law, and the persistence of human ethnic groups in exploring the unknown and the nature of seeking advantages and avoiding disadvantages have led the AI technology, which has experienced two sharp ups and downs, to be reborn as a key element of digital ecology, not only building a coevolutionary ecological circle of symbiosis, competition, cooperation and dependence, but also

exposing many risks in information judgment, decision support and labor substitution [4]. The financial industry is the key industry of big data application. Through the analysis of big data, it is possible to give early warning of possible Internet financial risks, so that relevant enterprise personnel can formulate reasonable preventive strategies in time, and ensure the normal operation of Internet finance through the analysis of multiple data. AI, as a product of the information age, provides great convenience for people [5]. With the continuous development and wide application of AI, it is necessary to speed up the upgrading of traditional industries, especially relative to the financial industry. As the most basic traditional industry, financial risk control should make full use of AI to innovate and constantly improve the current risk prevention and control system.

## 2. AI promotes the reform and growth of the financial industry

### 2.1 AI improves service efficiency

Internet finance, as the main channel of information transmission, will produce product evaluation and user communication data in the process of actual work, which can fully reflect the public opinion orientation. For China, which is in the process of rapid economic development and the gradual integration of financial markets with the world, how to strengthen the prevention and control of financial risks has become the key to influence whether China can move from a big country to a powerful country

in the future [6]. The use of nonparametric statistical method based on Internet platform can effectively combine traditional structural data analysis with unstructured data analysis, and then realize the grasp of the overall operation status of the surveyed objects, and then summarize the existing rules and build a change path for the operation status of enterprises. According to the constructed path, the risk points that need to be controlled in the financial behavior of the enterprise can be analyzed in real time. On this basis, we can evaluate the existing risk points point by point, and finally realize the control of financial risks. Financial risk refers to any risk that may lead to property loss of enterprises or institutions, which is the uncertainty and volatility of future earnings of enterprises. The framework of deep learning model of finance is shown in Figure 1.

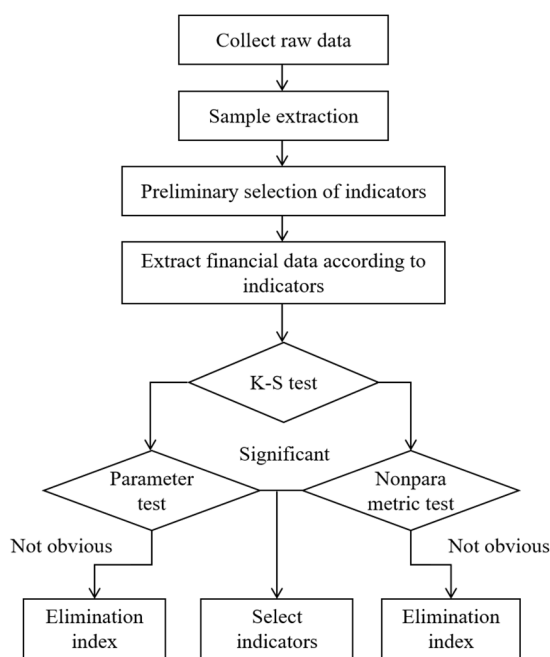


Figure 1 Deep learning model construction framework for financial risk

Through the measurement and understanding of risks, corresponding measures and disposal schemes are taken to minimize risks and maximize profits. Internet finance is a manifestation of informatization, and the growth of Internet financial activities will produce enterprise customers and related service information. Compared with traditional financial activities, the information collection on the Internet is more convenient, and even the transaction records of users can be directly stored, which is convenient for the construction of the Internet platform in the future, and is helpful for the communication between the sales staff and the buyers. Faced with numerous data information, how to make full and effective use of it and avoid information asymmetry as much as possible is crucial for the financial industry. The effective application of AI in the financial field can analyze and integrate these data, reduce financial risks to some extent, and effectively save labor costs.

## 2.2 Big data improves precision marketing capability

With the development and popularization of information technology, most contemporary financial transactions have moved from offline to online, so today's finance is also called Internet finance. The growth of the financial industry needs to be based on the vast number of commodity consumers, provide financial security for the people in the process of online transactions, and earnestly safeguard the economic interests of consumers. At the same time, in order to comprehensively improve the effective growth of financial activities, it is necessary to do a good job in the management of user data, and the basic information of users will be directly collected into the enterprise information management system. Big data collects, classifies, stores and deeply digs structured and unstructured data generated in financial activities, and discovers new knowledge, creates new values and enhances new capabilities. In the early days, the level of scientific research was still relatively backward. At that time, scientists thought that machines must be able to think like people in order to realize intelligence. However, after many experiments, they always failed. At this time, they realized that machines do not have to be intelligent with human brains, but can solve problems that human brains can solve [7]. Figure 2 shows the network precision marketing process based on big data.

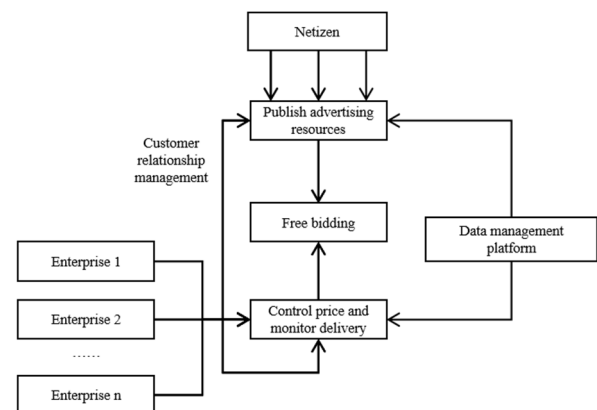


Figure 2 Network precision marketing based on big data

Under the traditional financial model, the bank's income channel is mainly through loans to individuals or enterprises, and the corresponding interest difference is the source of the bank's income. There are many risks in this financial model, such as the lender's failure to repay the loan on time, which will have a significant impact on the bank, or even directly close down. In order to further explore the value hidden behind these data, big data mining technology came into being, which requires our equipment to extract valuable information from complicated data information, so as to realize the effective use of data information.

### 3. AI helps prevent financial risks

#### 3.1 Strengthen the coverage of big data

Data is an indispensable information source in the process of financial risk management. Only by providing comprehensive information can we make efficient financial risk decisions. Therefore, data acquisition is particularly important. It provides a vital and essential information data foundation for financial risk management, guarantees the comprehensiveness of information data to a greater extent, and provides reliable help for improving the decision-making efficiency of financial risk management [8]. There are many factors influencing systemic financial risks, including asset maturity mismatch and irrational fluctuation in the financial system, macroeconomic imbalance and international economic factors. With the help of big data, all-round data information can be obtained, and the paths of their mutual influence, interaction and spillover can be analyzed by using mathematical statistics, so as to provide scientific decisions for preventing systemic financial risks. Figure 3 shows the process of local financial risk prediction based on fuzzy neural network.

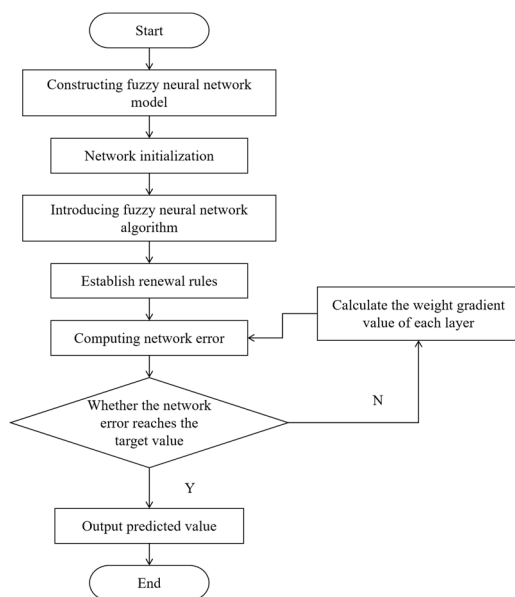


Figure 3 The partial prediction process of financial risk

The risk early warning system is mainly for risk detection and early warning of the current Internet financial transaction process. The construction of this system needs to run through the whole process of financial activities to safeguard users' own interests. At the same time, it also needs to reflect the decisions and documents made by the government and regulatory agencies in time to judge whether various transaction behaviors conform to social norms. Credit risk is the loss caused to the bank due to irresistible factors and vicious fraud, which makes the debtor unable or unwilling to perform the signed contract. At present, the foundation of ensuring information security in our country is still weak, so we should actively encourage institutions that research and develop AI technology to develop user information encryption

technology. However, financial institutions generally do not have the ability to research and develop user information encryption technology alone. Therefore, financial institutions should strengthen cooperation with institutions that research and develop AI technology in the process of applying AI in risk management, and make use of their technical advantages and professional research and development capabilities to prevent the risks that threaten information security.

#### 3.2 Enhance the accuracy of AI technology

Banks often fail to understand the process of changing the financial situation of individuals and enterprises in time or are covered by circular credit. By mining the influencing factors of customer credit through data mining technology, such as regional differences, personal knowledge level, income level, economic environment, social duties, etc., the user credit rating can be quickly established, and then different credit lines can be given. The outstanding advantage of AI is the integration of deep learning and big data. It can capture the risk sources in a large amount of rapidly changing information in the financial market and provide scientific decisions for risk management. The financial risk identification system based on AI is shown in Figure 4.

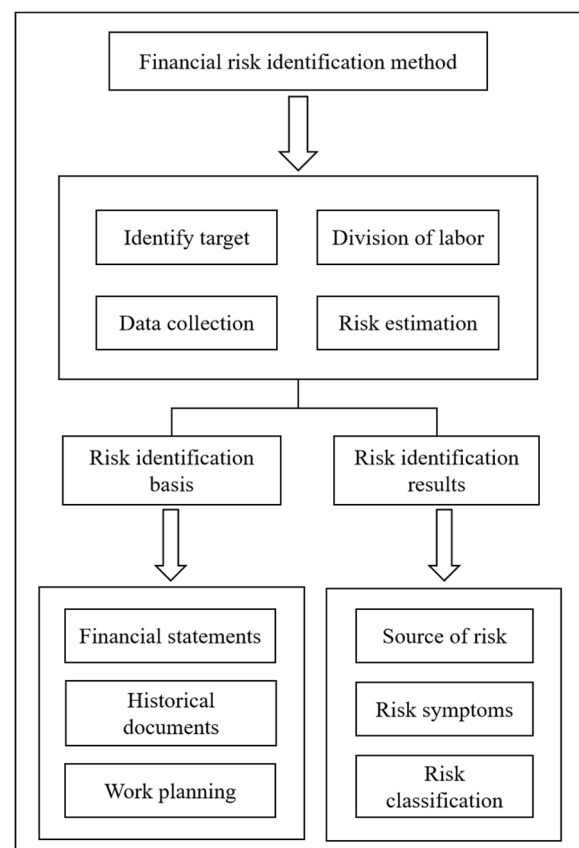


Figure 4 AI-based financial risk identification system

In order to master the development characteristics and laws of financial risks, we should strengthen the application of AI technology, and dig out the essential features from the superficial features through AI technology, so as to provide guarantee for improving the

accuracy of financial risk management. Reasonable application of AI in the field of financial risk management can speed up data processing and analysis, and effectively save labor costs. Moreover, in order to fully implement the risk management system, we must first sort out and rectify the risk management process, so that each process point can be managed by the corresponding department or individual to ensure the effective implementation of risk management rules and regulations. The comprehensive application of AI technology in financial risk management also needs to give full play to the advantages of AI technology in deep learning, big data fusion and so on. Using this technical advantage of AI technology, we can accurately capture massive information in the financial market and risk factors, thus laying a more scientific, accurate and comprehensive decision-making foundation for financial risk management decision-making.

#### 4. Conclusions

With the development and application of AI, it has become an inevitable trend to develop into the modern financial industry, realizing the transformation and transformation of financial products, financial services and other aspects, providing great help for the improvement of the financial ecological environment and providing people with more convenient, comprehensive and diverse experiences. In the growth of Internet finance, it is necessary to do a good job of data analysis, strictly follow the application principle of timeliness, combine the content instability of Internet financial data, design a systematic data center system, and pay attention to the importance of real-time analysis. To prevent and reduce financial risks as much as possible, to judge possible financial risks, to make early warnings and measures in advance, and to deal with internet financial risks continuously in time and content. The application of AI also lacks the information of unknown and uncertain time, which leads to the error of information analysis, which has a great impact on the financial system. Therefore, investors and regulators should have a correct understanding of it. When applying AI in controlling financial risks, they should also strictly guard against new risks caused by imperfect AI.

#### References

1. Zhang Q, Wu K J, Tseng M L. Exploring Carry Trade and Exchange Rate toward Sustainable Financial Resources: An application of the Artificial Intelligence UKF Method[J]. Sustainability, 2019, 11(12):3240.
2. Yu Xiaojian, Peng Yongyu. Application and Challenges of Artificial Intelligence in Financial Risk Management [J]. Southern Finance, 2017(9):5.
3. Vanneschi L, Horn D M, Castelli M, et al. An artificial intelligence system for predicting customer default in e-commerce[J]. Expert Systems with Applications, 2018, 104(8):1-21.
4. Mannes A. Governance, Risk, and Artificial Intelligence[J]. Ai Magazine, 2020, 41(1):61-69.
5. Galderisi A, Zammataro L, Losiouk E, et al. Continuous Glucose Monitoring Linked to an Artificial Intelligence Risk Index: Early Footprints of Intraventricular Hemorrhage in Preterm Neonates[J]. Diabetes Technology & Therapeutics, 2019, 21(3): 146-153.
6. Chen Guangxi. Discussion on the application and challenges of artificial intelligence in the field of financial risk management [J]. 2019.
7. Li Sisi. On the innovative application and challenge analysis of artificial intelligence in the field of financial risk management [J]. Public Investment Guide, 2019(2):2.
8. Rico-Contreras J O, Aguilar-Lasserre A A, JM Méndez-Contreras, et al. Moisture content prediction in poultry litter using artificial intelligence techniques and Monte Carlo simulation to determine the economic yield from energy use[J]. Journal of Environmental Management, 2017, 202(1):254-267.