

# Research on the Subject System of Artificial Intelligence Participating in Financial Activities

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**Abstract.** With the rapid development of artificial intelligence technology, its application in the financial field is attracting widespread attention. This paper aims to conduct in-depth research on the institutional issues involved in the participation of artificial intelligence in financial activities. Through case analysis and empirical data, this study reveals the institutional challenges and potential opportunities caused by artificial intelligence in the financial field, providing valuable references for financial entities and regulatory authorities to adapt to the rapidly changing financial environment.

**Keywords:** Artificial intelligence; financial activities; institutional framework; challenges opportunities

## 1 Introduction

In the era of digitization and informatization, artificial intelligence technology is profoundly changing various fields <sup>[1]</sup>. As an important support for economic operation, the financial industry has also been deeply influenced by artificial intelligence technology. The application of artificial intelligence in areas such as automated trading, risk assessment, and customer service has not only improved the efficiency of financial activities, but also brought new challenges <sup>[2]</sup>.

## 2 The Application and Impact of Artificial Intelligence in the Financial Field

### 2.1 Application of Artificial Intelligence in Financial Activities

The application of artificial intelligence in the financial field has shown diversity and universality, with automated trading and investment being one of the most significant applications. This application field covers markets such as stocks, foreign exchange, commodities, as well as financial products such as quantitative funds. Through powerful algorithms and real-time data analysis, artificial intelligence systems can achieve high-speed market monitoring and analysis, quickly capture market trends and opportunities, and thus automate buying and selling operations. Compared to traditional manual transactions, automated transactions have higher transaction speed and accuracy, enabling transaction

decisions to be made at the millisecond level, thereby reducing the impact of human errors and emotional factors on transactions.

This automated transaction not only improves the efficiency of transactions, but also reduces transaction costs and creates greater value for investors <sup>[3]</sup>. Investment institutions have integrated artificial intelligence systems into the trading process, achieving large-scale trading operations and better meeting the needs of customers.

On the other hand, artificial intelligence also plays a crucial role in risk assessment and management. Financial institutions can use artificial intelligence models to analyze a large amount of historical data and market information in the process of loan approval, credit evaluation, and other business processes, in order to identify potential risk factors and conduct risk prediction and simulation. This precise risk management helps financial institutions better respond to market fluctuations and risk events, protecting their own stability and sustainability <sup>[4]</sup>.

## **2.2 The impact of artificial intelligence on the institutional framework of financial activities**

The application of artificial intelligence not only changes the actual operation mode of financial activities, but also has a profound impact on the institutional framework of financial activities <sup>[5]</sup>. Firstly, the widespread application of artificial intelligence technology has led to changes in the skill requirements of financial professionals. Traditional financial professionals need to gradually adapt to the environment of collaborating with artificial intelligence systems, and master the corresponding skills and knowledge. Traditional financial positions require strengthening skills closely related to artificial intelligence, such as data analysis, machine learning, and programming, in order to better respond to changes in fields such as automated trading and risk assessment <sup>[6]</sup>. In addition, it is necessary to cultivate practitioners with interdisciplinary backgrounds who can effectively collaborate with technical teams to promote innovation and application of artificial intelligence in the financial field.

Secondly, the application of artificial intelligence in financial activities also involves issues of information transparency and privacy protection. Although artificial intelligence can process

large-scale data to obtain more accurate results, this process may also involve risks to user privacy and data security. Financial institutions and regulatory authorities need to establish appropriate legal and technical frameworks to ensure sufficient protection of personal privacy while supporting the legitimate use and sharing of data.

## **3 Institutional Adjustment Requirements for the Participation of Artificial Intelligence in Financial Activities**

### **3.1 Data Privacy and Security Assurance**

Against the backdrop of the widespread involvement of artificial intelligence in the financial field, a large amount of data from individuals and institutions has been applied to model training and algorithm optimization. These data not only contain personal privacy information of customers, but also commercial secrets of enterprises. Therefore, the continuous highlighting of

data privacy and security issues has become an important issue that needs to be urgently addressed.

With the increasing risk of data leakage and abuse, it is urgent to strengthen data privacy protection. The key to protecting data privacy is to establish stricter and comprehensive data privacy laws and regulations. These regulations should clearly regulate the principles of collecting, using, and sharing personal data, providing individuals with stronger control and information rights. At the same time, a clear punishment mechanism for violations should be established to strengthen the crackdown on data privacy violations, thereby building a trustworthy and secure data environment and enhancing public trust.

In addition to the formulation of laws and regulations, technical means should also be fully applied to ensure the security of data transmission and storage. Using data encryption technology can effectively prevent unauthorized access, even if data is stolen, it is difficult to decrypt its content.

Meanwhile, deidentification technology can remove personally identifiable information while maintaining data availability, thereby further reducing the risk of data leakage. The application of these advanced technologies provides strong support for the protection of data privacy.

Financial institutions and enterprises also have important responsibilities in data security management. They need to establish a clear data security management system, clearly define the process of data collection, storage, and processing, and ensure that data operations are carried out within a compliant and standardized framework. In addition, a comprehensive data security risk assessment system should be established to systematically assess and prevent potential security risks, and to promptly identify potential threats.

### **3.2 Talent cultivation and career planning**

As artificial intelligence becomes more prevalent in finance, the skills required of financial professionals are evolving significantly. Conventional financial expertise is no longer sufficient. Today, practitioners must possess a broader skill set, including data analysis, machine learning, and programming, to navigate the new financial landscape. Consequently, nurturing talent has become a critical undertaking that demands comprehensive enhancement.

Financial education institutions should swiftly revise their curricula and seamlessly integrate AI-related content into their teaching frameworks[7]. This encompasses not only theoretical instruction but also underscores hands-on practice and case analysis, ensuring students truly grasp the application of AI in finance. Simultaneously, fostering innovative thinking and problem-solving abilities is essential, enabling students to adeptly handle increasingly intricate financial challenges.

Continual learning is imperative not only for financial professionals but also for financial institutions striving for sustainable development. These institutions can establish internal training initiatives to deliver ongoing education and skill updates for employees, thereby enabling them to stay current. Meanwhile, tailored training plans should be developed to cater to diverse roles and career stages, facilitating practitioners in deepening and broadening their skill sets across various domains.

As automated transactions and other AI applications gain traction, certain traditional financial roles may diminish or vanish. To confront this, financial institutions and government bodies must collaborate closely to devise targeted policies. This encompasses providing affected professionals with career guidance to comprehend opportunities in emerging domains. Offering transition training allows smooth adaptation to new positions, and promoting entrepreneurship encourages innovative talents to explore prospects in burgeoning sectors.

### **3.3 Optimization of Risk Management and Regulatory Framework**

With AI's increasing integration into finance, it poses substantial new challenges to financial risk management and regulation. The traditional regulatory framework falls short in addressing AI's complex and swiftly evolving impact. Thus, refining regulations is vital to ensure enduring financial system stability and sustainability.

A key step is leveraging AI to enhance risk monitoring and prediction. Regulatory bodies can use technologies like big data analysis and machine learning to develop more precise regulatory models. These models, by monitoring market data and trading in real-time, can proactively identify potential risks, enabling regulators to take targeted measures to prevent financial risks.

Simultaneously, clear guidelines are needed for AI's use in finance. Stringent admission standards should be set for AI algorithm development and deployment, obliging financial institutions and tech companies to ensure transparent, interpretable, and stable algorithms[8]. This bolsters regulatory understanding and evaluation of AI decision-making, thereby improving risk assessment.

For global financial stability, cross-border regulatory cooperation is paramount. Regulatory bodies from various regions should establish closer collaboration to jointly formulate standards and best practices for AI in finance. Such collaboration reduces regulatory arbitrage risks, addressing challenges posed by cross-border financial activities and reinforcing comprehensive financial system stability and security.

## **4 Case Analysis**

### **4.1 Application Cases of Artificial Intelligence in Automated Transactions**

An investment management company has developed an artificial intelligence based quantitative trading system that utilizes machine learning algorithms to analyze historical market data and real-time information, predict market trends, and automatically execute trading strategies. The system can identify potential trading opportunities and risks, and automatically adjust trading positions based on preset risk preferences and target returns. In addition, the system can also monitor transactions in real-time and make timely adjustments based on market changes.

This case reveals the multiple advantages of artificial intelligence in automated transactions. Firstly, machine learning algorithms can process a large amount of complex data, identify market patterns that are difficult for humans to perceive, and improve the accuracy and efficiency of transactions. Secondly, automated trading systems eliminate the impact of human emotions and cognitive biases, making transactions more stable and rational. Most importantly, this application has also had an impact on the financial entity system.

The application of artificial intelligence in automated transactions has triggered a series of impacts on the institutional framework of financial entities. Firstly, the automation and intelligence of transactions may lead to increased opacity in transaction execution, making regulation more difficult. In order to ensure the fairness and transparency of the market, regulatory authorities need to formulate corresponding policies that require trading institutions to disclose algorithms and transaction logic, and protect the rights and interests of market participants. Secondly, the risk management of automated transactions also needs to be taken seriously. Although artificial intelligence can optimize trading strategies, it may also cause systemic risks due to model errors or data anomalies. Financial institutions need to establish a comprehensive risk management mechanism and develop a review and monitoring process for trading strategies to respond to potential risk events.

#### 4.2 Empirical Research on Artificial Intelligence in Risk Assessment

Risk assessment, as the core link of financial activities, is of great significance in ensuring the stability and sustainability of the financial system. With the rapid development of artificial intelligence technology, its application has deeply influenced the methods and effectiveness of risk assessment. In order to better understand the practical application of artificial intelligence in risk assessment, this study takes a bank as an example, which uses artificial intelligence technology to predict and manage customer credit default risk. Banks obtain a large amount of customer credit history, financial status, social network information, and other data through data collection. These data cover multiple dimensions such as customers' personal information, financial status, and repayment records, providing a rich information foundation for credit risk assessment. Banks use machine learning algorithms to conduct in-depth analysis of these data and identify potential risk factors to construct credit default risk prediction models. In the process of model construction, the bank adopted various machine learning algorithms, such as decision trees, random forests, neural networks, etc., to train a large amount of historical data. By learning patterns and patterns in the data, the model can identify features related to credit default and make risk predictions based on these features. After training and optimization, the model has achieved high accuracy and generalization ability. To verify the effectiveness of the model, the bank conducted validation tests using historical data. In validation testing, banks compared artificial intelligence models with traditional statistical methods to evaluate their performance in predicting credit default risk. By comparing model indicators, we can better understand the actual effectiveness of artificial intelligence in risk assessment.

**Table 1.** Comparison between Artificial Intelligence and Traditional Statistical Methods in Risk Assessment

Model Metrics	AI Model	Traditional Statistical Method
Accuracy	90.5%	85.2%
Recall	88.2%	76.7%
Precision	92.6%	89.4%
F1 Score	90.3%	82.8%

The data indicators in Table 1 are accuracy, recall, accuracy, and F1 score. These indicators comprehensively consider the predictive ability, comprehensiveness, and accuracy of the model, which helps to evaluate the comprehensive performance of the model in risk assessment.

Firstly, in terms of accuracy, the accuracy of the artificial intelligence model has reached 90.5%, while the accuracy of traditional statistical methods is 85.2%. This means that artificial intelligence models are more capable of making accurate predictions and have higher predictive accuracy when identifying customer credit default risks.

Secondly, in terms of recall rate, the artificial intelligence model performed well, reaching 88.2%, while the recall rate of traditional statistical methods was 76.7%. This indicates that artificial intelligence models can better capture actual default situations, reduce the possibility of missed judgments, and thus more comprehensively identify potential risks in risk management.

In terms of accuracy, the artificial intelligence model is 92.6%, slightly higher than the 89.4% of traditional statistical methods. This means that when identifying defaulting customers, artificial intelligence models are more likely to be genuine defaulting customers, reducing the probability of misjudgment and improving the accuracy of risk assessment.

Finally, the F1 score takes into account both accuracy and recall. The artificial intelligence model's F1 score is 90.3%, while the traditional statistical method's F1 score is 82.8%. This further strengthens the comprehensive advantages of artificial intelligence models in risk assessment, indicating their outstanding performance in balancing prediction accuracy and comprehensiveness.

Overall, this empirical research case fully demonstrates the potential and advantages of artificial intelligence in risk assessment. By using machine learning algorithms, banks can more accurately identify potential credit default risks and achieve early prediction and control of risks. Compared with traditional statistical methods, artificial intelligence has more advantages in processing large-scale and multi-dimensional data, and can mine more subtle correlation relationships, thereby improving the accuracy of risk assessment.

## **5 Conclusion and Outlook**

Through in-depth exploration of the application and impact of artificial intelligence in financial activities, as well as the need to adjust the institutional framework of financial entities, this paper presents the widespread impact of artificial intelligence in the financial field. Although artificial intelligence technology has brought many opportunities, it has also raised issues such as data privacy, vocational training, and risk management. Faced with these challenges, financial entities need to adapt to the new environment, optimize systems and policies, to ensure the stability and sustainability of the financial system. Looking forward to the future, with the continuous evolution of technology, artificial intelligence will continue to play an important role in the financial field, creating greater value for financial activities, while also requiring continuous attention to related institutional and moral issues.

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