New Characteristics of AI Analysis of Financial Risks and their Transmission Traceability Paths

Xiaochen Liu[1,a*]

[1]*China Everbright Postdoctoral Workstation, Beijing, China*

[a]*ann4498@sina.com*

[*]*corresponding author*

Abstract: With the development of the times, the financial industry has gradually ushered in changes and formed new financial models. This article briefly explores the characteristics of AI (Artificial Intelligence) in financial risk analysis, and evaluates its application scenarios and risk analysis. Compare traditional financial risk control with AI risk control models and analyze the performance of the latter. Compared to the former with a feature count of 50, the latter has a feature count greater than 1000, making it easier to capture more detailed risk features and effectively identify complex nonlinear risk factors, thereby establishing a more accurate risk prediction model. In the study, a specific case of bank card crime was used to deeply explore and analyze the advantages, opportunities, and threats of AI in preventing bank card crime, and to propose effective prevention of bank card crime through risk prevention triggering mechanisms. This mechanism can automatically trigger warnings based on the recognition and risk harmfulness of AI, enhance human intervention, and thus achieve more efficient risk prevention and prevention. At the end of the paper, the Pathogen transmission of financial risk is evaluated. Through these achievements, we can provide certain assistance for the challenges and prevention of financial risks.

1. Introduction

With the continuous development of the financial market and the increasing complexity of financial business, the types and scale of financial risks are also constantly expanding. Traditional financial risk management methods are no longer able to meet the risk management needs of financial institutions. Although AI is still in its early stages of application in enterprises, its emergence and development have provided new solutions for financial risk management [1-2]. AI technology can mine massive amounts of data, provide more accurate, fast, and effective risk analysis and prediction services, and provide financial institutions with more decision-making support and risk management tools [3-4]. However, with the continuous deepening of the

application of AI technology in the financial field, it also faces some new characteristics and challenges [5-6]. For example, problems such as large amount of data, complex data sources, opaque models, and difficult to explain have brought certain restrictions and challenges to the application of AI in financial risk analysis. In order to better play its role in financial risk management, it is necessary to deeply explore its new characteristics and challenges in financial risk analysis, explore its dissemination and traceability channels, and provide more accurate and reliable risk prediction and decision-making support for financial institutions.

The combination of AI and finance has received widespread attention from researchers. Lee J [7] discussed the funding and financial resources required to regulate AI (AI) in the financial services industry, and explored the impact of insufficient funding sources and financial resource limitations on AI regulation. He proposed some solutions, such as developing new financing models, establishing AI regulatory fund pools, strengthening policy coordination, and promoting public-private sector cooperation, to promote the development and implementation of AI regulation, which is of great significance for promoting the development and implementation of AI regulation. Van Thiel D [8] explored empirical research on the use of analytical AI tools for credit risk prediction in the digital age. The literature explores the potential and practical effects of AI in credit risk prediction by comparing the effectiveness of traditional credit risk prediction methods with credit risk prediction methods based on AI. His research results indicate that compared to traditional credit risk prediction methods, credit risk prediction methods based on AI have higher accuracy and predictive ability. This indicates that in the digital era, the use of AI tools can better identify and predict credit risks, thereby helping financial institutions better control risks and improve efficiency.

The purpose of this study is to explore the new characteristics of AI in financial risk analysis and its propagation and tracing pathways. Traditional risk control is compared with AI risk control models, and the effectiveness of the latter in preventing risks is analyzed. Through relevant cases, the characteristics of AI financial risks are analyzed in detail, helping us to have a deeper understanding of the current application status and future development direction of AI in financial risk analysis.

2. Application Status of AI in the Field of Financial Risk Control

2.1 AI would Inevitably Intervene in the Field of Internet Finance

In the field of bank risk control, AI is mainly used for risk assessment, anti fraud, network security, and credit evaluation. Through deep learning and data mining of customer data, transaction data, behavior data, etc., AI can help banks achieve more detailed, accurate, and rapid risk assessment and anti fraud identification, improving the accuracy and efficiency of bank risk management [9-10]. AI technology is playing an increasingly important role in the entire chain of services before, during, and after loans. In the pre loan stage, the intelligent identification and risk control of AI technology can better screen out reliable customers and lower risk loan applications. In the loan stage, intelligent monitoring and prediction through AI technology can better control risks and manage loans. In the post loan stage, intelligent collection and intelligent customer service through AI technology can better improve collection efficiency and customer satisfaction. The full chain service process is shown in Figure 1:
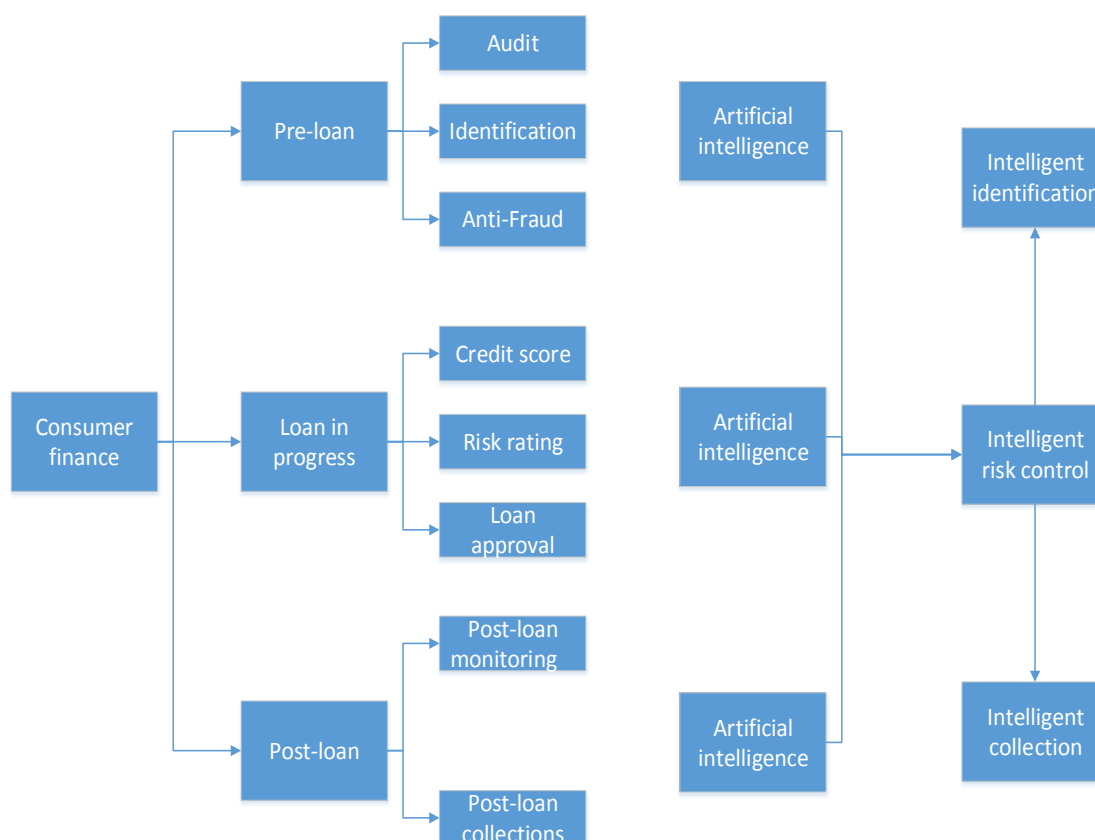
Figure 1. AI in the field of consumer finance full process scenario application

2.2 Data Driven would be the Main Form of AI Intervention in Financial Risk Control

Data driven is one of the main forms of AI technology intervention in financial risk control. With the continuous expansion of financial business and the accumulation of financial data, financial institutions have a massive amount of data resources [11-12]. These data are an important foundation for risk analysis and prediction.

Through a data-driven approach, it can conduct deep learning and data mining on these data, discover the patterns and trends behind the data, and improve financial institutions' ability to identify and control risks. For example, by analyzing customer behavior data and transaction data, abnormal transactions and fraudulent behavior can be identified, improving anti fraud capabilities; Through the analysis of Market data and economic data, we can Prediction market trends and economic trends, and improve the accuracy and efficiency of investment decisions.

At the same time, data-driven methods can also achieve automation of risk management, improve the efficiency and accuracy of risk management. Through the automation of this technology, risk assessment, anti fraud, network security and other risk management work can be automated, reducing the cost and risk of manual operations.

The success of Alibaba Zhima Credit fully demonstrates the application potential and prospect of AI in the field of financial risk control. By analyzing a large amount of user data, including their shopping records, social network information, credit history, etc., it constructs a comprehensive credit evaluation system covering multiple fields such as consumption, life, and social interaction. Through the application of AI technology, Zhima Credit can realize rapid, accurate and comprehensive credit evaluation and provide more personalized and accurate credit services.

2.3 Risk of AI Application in Finance

Although the application of this technology in the financial field has brought many benefits, there are also many risks and challenges that require us to make assessment and prevention preparations. This article mainly conducts financial risk analysis from four aspects, as shown in Figure 2:
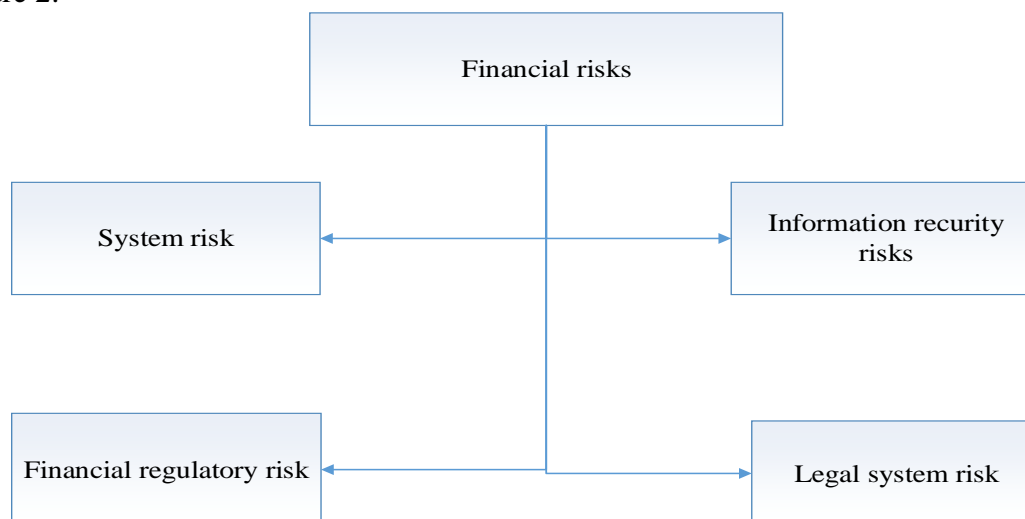

Figure 2. Financial risk analysis architecture

2.3.1 Systemic Risk

First of all, the application of AI technology may lead to algorithm failure or out of control, thus causing Systemic risk. Due to the complexity and uncertainty of AI technology, there may be instances of algorithm failure or loss of control, such as errors in AI models or data biases. This may lead to abnormal fluctuations or instability in the financial system, which may lead to Systematic risk [13-14]. It may also increase the complexity and uncertainty of the financial system, thereby increasing Systemic risk. Due to the complexity and high adaptability of AI technology, it may have an impact on the stability of the financial system. For example, the complexity of AI algorithms may lead to results that are difficult to explain and understand, thereby increasing the uncertainty and risk of the system. In addition, this technology may lead to problems such as over dependence and over concentration of data, thus aggravating Systemic risk. As AI technology requires a large amount of data to train and verify models, it may lead to excessive dependence and concentration of financial institutions on data, thus increasing Systemic risk. For example, if there is a change or error in the information of a certain data source, it may have an impact on the risk control of the entire system. Finally, the application of this technology may also bring new risk factors, such as black box operation, data security and other issues, thus increasing Systemic risk. Due to the intelligence and adaptability of AI technology, it may be difficult for people to understand and explain the decision-making process of algorithms, thereby affecting the transparency and controllability of the system.

2.3.2 Information Security Risks

This technology may increase the attack surface of financial institutions, thereby increasing the risk of hacker attacks. For example, in 2017, Equifax, the US credit rating agency, was attacked by hackers, resulting in the disclosure of personal information of nearly 140 million people, including

sensitive information such as names, Social Security number and birth dates. One of the reasons for hacker attacks is that Equifax failed to update its network security system in a timely manner, allowing hackers to exploit vulnerabilities for attacks. Due to the large amount of computing resources and data storage capacity required by this technology, it may increase the attack surface of financial institutions, thereby increasing the risk of hacker attacks [15-16]. For example, hackers can obtain sensitive information and data from financial institutions by attacking AI models or datasets. Secondly, the application of this technology may also lead to data privacy leakage or abuse. Due to the large amount of data stored by financial institutions, it may contain sensitive information of users, such as personal identity information, transaction records, etc. The application of this technology may also lead to internal information security issues in financial institutions. Due to the large amount of data and computing resources required by AI technology, it may lead to an increase in the flow and exchange of data within financial institutions, thereby increasing the risk of information leakage. For example, employees may use AI technology to obtain unauthorized sensitive information. Finally, it may lead to attacks and fraud issues with intelligent algorithms. Due to the adaptability and intelligence of AI technology, it may lead to AI algorithms being used for attacks and fraud. For example, hackers can modify the decision-making results of financial institutions or engage in fraudulent behavior by attacking algorithms.

2.3.3 Financial Regulatory Risks

Financial regulatory risk refers to the risks that regulatory agencies face during the regulatory process, including regulatory policy errors, regulatory deficiencies, etc. Due to the innovative and highly complex nature of this technology, it may pose challenges to existing regulatory policies. For example, financial institutions may use this technology to evade regulation, leading to regulatory policy errors and increased regulatory risks [17-18].

2.3.4 Legal System Risks

Legal system risk refers to the risks existing in laws, regulations, policies, etc., including legal loopholes, legal risks, etc. The application of this technology in the financial field may also bring legal system risks, which may lead to legal loopholes or an increase in legal risks. Due to the innovation and complexity of this technology, existing legal provisions may not be able to fully meet the needs of its application, thereby increasing legal loopholes and risks. For example, the autonomous decision-making of AI algorithms may violate human morality and values, leading to legal disputes or controversies. Secondly, it may also raise legal issues related to privacy protection and data security [19-20]. Due to the fact that AI technology requires a large amount of data to train and validate models, it may involve issues of user privacy and data security. If financial institutions fail to properly manage and protect user privacy and data security, it may violate relevant legal provisions, leading to legal risks and disputes. Thirdly, it may raise legal issues regarding intellectual property rights. Due to the application of AI technology requiring a large amount of data and algorithms, it may involve intellectual property issues. For example, financial institutions may use algorithms or datasets from third-party companies for the application of AI technology, leading to intellectual property infringement issues. Finally, raise legal issues regarding transparency and fairness. Due to the difficulty in interpreting and understanding the decision results of AI algorithms, it may lead to difficulties for users to understand the decision results of financial institutions, leading to legal issues related to fairness and transparency. If financial institutions fail to conduct open, transparent and Fair dealing treatment in accordance with relevant laws and regulations, legal risks and disputes may arise.

2.4 Use Deep Learning and Knowledge Graph to Improve Intelligent Risk Control

Table 1. Comparison of AI risk control model and traditional risk control model

| Risk control model	Data dimension	Model
Traditional risk Control model	Based on the basic characteristics of a person or company such as age, salary, workplace, etc., the characteristics are generally less than 50, which are basically strong variables.	Linear model dominated
AI risk control model	The number of features is greater than 1000, including basic feature information, behavioral feature information and analysis features, etc., which are basically weak variables.	Integrated models, deep learning oriented
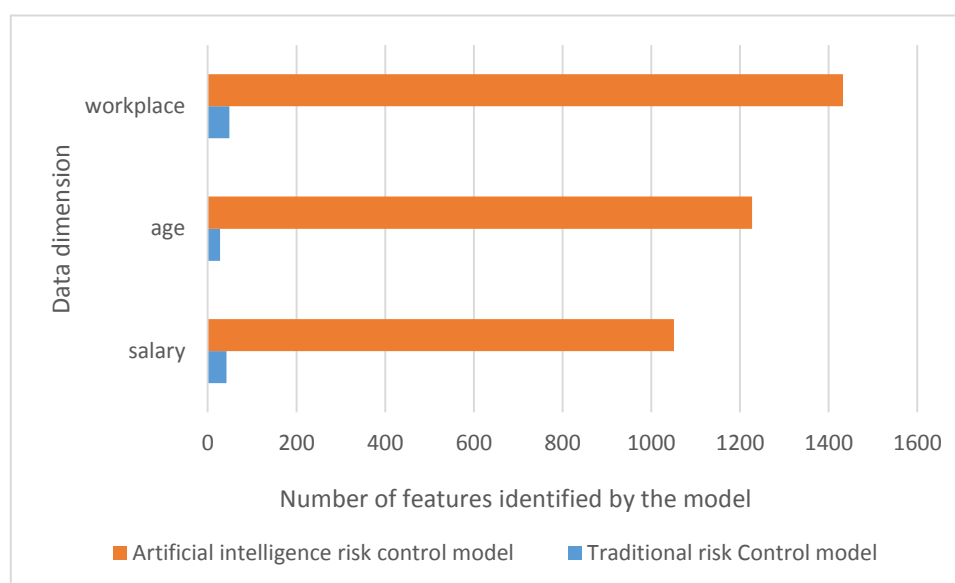
Figure 3. Comparison of the number of features identified by two different models

According to Table 1 and Figure 3, traditional financial risk control models are generally based on the basic feature information of individuals or companies, with a relatively small number of features, generally not exceeding 50. The model generally adopts a linear model. Although this model is simple and easy to use, it often fails to capture more detailed risk features, making it difficult to identify some complex nonlinear risk factors.

In contrast, the number of risk control features in AI is higher than 1000 and mainly consists of weak variables. These features can be processed and extracted through techniques such as deep learning to establish more accurate risk prediction models. Meanwhile, AI risk control models generally adopt methods such as ensemble modeling and deep learning, which can better handle complex nonlinear risk factors and improve the accuracy and stability of risk prediction.

Knowledge graph is a Knowledge representation and reasoning based on Big data semantic association, which can effectively transform a large amount of unstructured data into structured data. In financial risk control, the Knowledge graph can link different financial entities and financial events to establish a complete Knowledge graph of financial risk. Through this Knowledge graph, we can better predict and manage risks and improve risk prevention and control capabilities.

3. AI of Financial Risks - Taking Bank Card Crime as a Case Study

3.1 AI Preventing Bank Card Crime ADOT

Bank card crime is a common financial risk that causes serious losses and threats to both banks and customers. Therefore, this technology can be adopted to identify abnormal transactions and fraudulent behaviors, thereby improving the accuracy and stability of risk prediction and management. The ADOT analysis is shown in Table 2:

Table 2. ADOT analysis of AI to prevent bank card crime

A-Advantages	O-Opportunity
1. Fast and accurate identification of abnormal transactions and frauds: Using big data analysis and machine learning algorithms to analyze and mine a large amount of transaction data to identify abnormal transactions and frauds 2. Automated risk control process: It can automate risk management, thus reducing the cost of manual intervention and the possibility of misjudging risks 3. Continuous learning and optimization: can improve the accuracy and efficiency of risk identification and management through continuous learning and adaptation	We provide more efficient, convenient and personalized services to customers in the form of intelligent customer service and intelligent investment advisors. Through intelligent customer service, customers can get faster and more accurate responses and solutions; through intelligent investment advisors, customers can get more professional and personalized financial advice and investment portfolios
D-Disadvantage	T-Threat
1.High data and computing power requirements: a large amount of data and computing power support to achieve accurate risk identification and management 2.Poor interpretability: the decision-making process is often a black box, which is difficult to explain and understand	Hackers can tamper with the model's decision results by attacking the model or data source, thus affecting the accuracy and reliability of risk management

3.2 Design of Preventive Measures before the Incident - Triggering Mechanism Means

By establishing a deep learning mechanism, we ensure effective prevention of bank card crime accidents before they occur. When critical risk behaviors are detected, an early warning mechanism is triggered. Among them, (AC) represents the improvement of the recognition ability of the technology. In cases where the recognition level of different events is the same, but the risk and harmfulness are different (BD), it is necessary to enhance manual intervention. The risk triggering mechanism can effectively prevent bank card crimes, which is a manifestation of its core advantage.

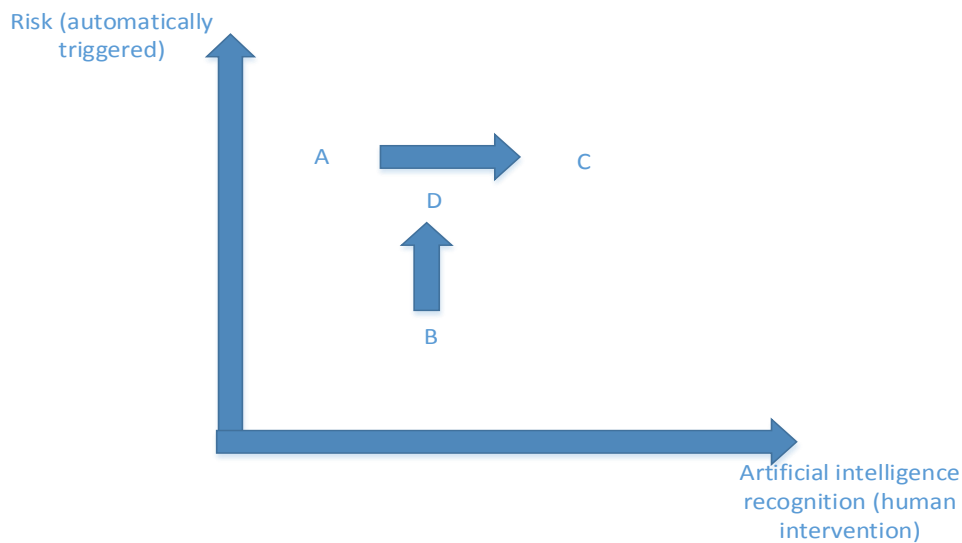The principles of the triggering mechanism are shown in Figure 4:

Figure 4. Trigger mechanism principle

3.3. Analysis of financial risk propagation pathways under artificial intelligence

When financial risks occur, it is very important to communicate risk information and early warning notices in a timely and accurate manner. Analyzing the communication channels of financial risks can help financial institutions better select and use communication methods so as to communicate risk information and early warning notices more effectively. At the same time, the analysis of communication channels can also help financial institutions understand the advantages, disadvantages and applicability of different communication channels, so that they can better develop risk management strategies and measures. This section analyzes the financial risk communication channels based on the analysis of this technology, which is carried out in the following three main ways, as shown in Figure 5:
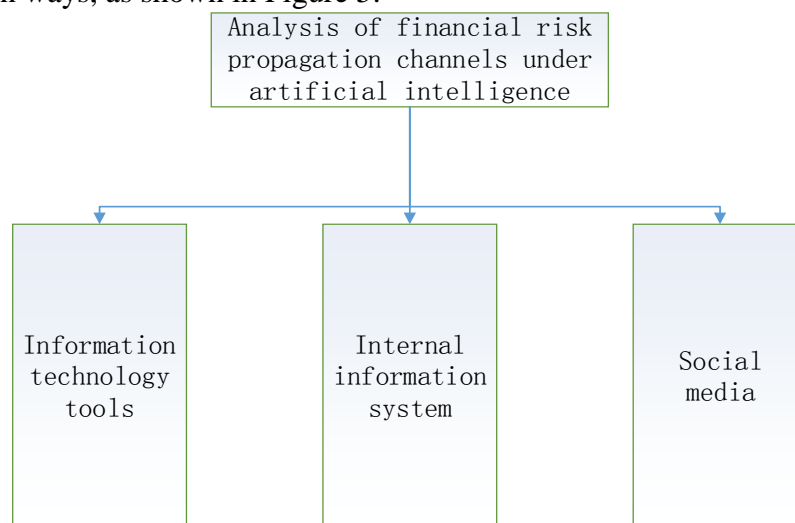

Figure 5. Analysis of financial risk propagation channels under artificial intelligence

First, it is mainly carried out by means of information technology. With the popularity of Internet and mobile communication technologies, financial institutions can communicate analysis results and early warning information to customers and employees through channels such as the Internet and mobile applications to help them better understand and respond to financial risks. These information technology tools have the characteristics of fast dissemination speed, wide dissemination range and low dissemination cost, which can help financial institutions quickly and accurately communicate risk information and early warning notices. At the same time, these technologies can also help financial institutions visualize and interactively display risk information to improve customers' and employees' understanding and awareness of risk information.

Second, financial institutions can use internal information systems to disseminate and directly transmit analysis results and early warning information to relevant departments and employees, thus helping them to understand and respond to financial risks more quickly. The internal information system has the characteristics of fast dissemination, high information controllability and good information security, which can ensure the accurate transmission and confidentiality of risk information. At the same time, financial institutions can also improve employees' awareness and ability to analyze and prevent financial risks through internal training and education, thus improving the risk prevention ability of the entire institution.

Finally, financial institutions can use social media platforms to deliver risk information and early warning notices to customers and the public, as well as to provide relevant risk management advice and services, etc. Social media has the characteristics of fast communication speed, wide communication range and high interactivity, which can help financial institutions achieve rapid transmission of risk information and interactive communication. At the same time, social media can also help financial institutions establish closer ties with customers and the public, and improve the brand awareness and credibility of the institution.

4. Conclusion

Today's financial industry has ushered in new opportunities and challenges in the The Internet Age. How to effectively solve problems and seize opportunities is worth thinking about. This paper briefly discusses the application of AI analysis in the consumer finance field, and the form of data driven analysis in the financial field. In addition, financial risks are analyzed and prevented from four aspects, and compared with traditional risk control and AI risk control, it is proposed to use deep learning and knowledge maps to complete intelligent risk control. In the third section, by analyzing the ADOT of AI in preventing bank card crimes, we deeply explore its risk characteristics and propose effective prevention of bank card crimes through risk prevention triggering mechanisms. These research findings provide new ideas and methods for risk management in the financial industry, and would provide more efficient, accurate, and intelligent solutions for future financial risk management.

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Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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