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Abstract. In recent years, artificial intelligence has been rapidly applied to the financial services industry, which has become more and more intensive in commercial applications, and its application in the financial field has become more and more common. Artificial intelligence has been widely used in various aspects of the financial sector, and has a major impact on financial markets, financial institutions, financial supervision and so on. However, at this stage, there is still a lack of research on the development of artificial intelligence in the financial field. The main purpose of this paper is to strengthen the research on artificial intelligence and make it reliable in the financial field to maintain financial development. This paper mainly studies the application of artificial intelligence and machine learning in various aspects of the financial field, and finds its impact on financial stability to reduce costs, improve risk management capabilities and market competitiveness.

1. Introduction

Artificial intelligence is the research, simulation, extension and extension of human intelligence. It is a discipline that uses computer to study different types, sources and quality data and extract valuable information from it. In recent years, with the development of computer technology and the availability of data and the increase in the quantity of quality, all parties have regained their enthusiasm for artificial intelligence and applied it to various fields including the financial industry. Machine learning is a branch of artificial intelligence. It is a technology that studies how computers simulate or implement human learning behaviors to acquire new knowledge and skills, and reorganize existing knowledge structures to continuously improve their performance. Research on artificial intelligence and machine learning can effectively promote the development of financial services, financial institutions to reduce costs, manage risks, improve business levels and increase revenue.

In recent years, artificial intelligence and machine learning have gradually been applied to more and more fields. In 2017, Liu Liu et al. [1] combed the development of artificial intelligence in order to study the influence of artificial intelligence on library and information science, expounded the position of machine learning in artificial intelligence, and combed the development of artificial intelligence. It expounds the position of machine learning in artificial intelligence, and finds that machine learning plays a huge role in the research of library and information science. In 2017, Li Li et al. [2] proposed a new machine learning framework for parallel learning, and studied the effective extraction of data and predictive learning. The research found that the new theoretical framework has more comprehensive advantages. In 2018, Lin Xiaotong and others [3] combined artificial intelligence and medical technology in order to improve the application of artificial intelligence, and studied the technical background of machine learning and its preliminary application and potential research direction in the field of plastic surgery. In 2018, Zhao Gan et al. [4] applied the artificial intelligence technology of machine learning to ophthalmology in order to improve the time-consuming and labor-intensive defects of traditional ophthalmology diagnosis. It was found that the combination of this technology plays an important role in the development of
ophthalmology.

with the development of economy. Research on financial stability is increasing. In 2016, Chen Yulu et al. [5] systematically examined the impact of financial cycles and financial volatility on economic growth and financial stability in order to study financial volatility. The empirical results show that during the period of financial ups and downs, the economic growth rate is low, and the financial crisis is prone to break out; in contrast, the economic growth rate during the normal period of finance is higher, and the stability of the financial system is also stronger. In 2016, in order to improve the stable institutional system brought about by the financial crisis and to sort out relevant literature and research progress at home and abroad, Lu Lei et al. [6] deeply reflected on the limitations of the traditional objectives and policy instruments of the Central Bank. The real-time liquidity management technology of the payment system will gradually replace the traditional management methods based on the post-event statistical system. In 2017, Yang Guang et al. [7] constructed a DSGE model in order to explore the impact of the zero interest rate floor on the economy. The study shows that the instability and vulnerability of the macroeconomic and financial systems will increase significantly when the zero interest rate floor is lowered. In 2018, Xia Xiaohua et al. [8] constructed an investment liability system model and applied a panel VAR model to study whether there is a Minsky cycle in China's economy in order to study the relationship between economic liabilities and financial stability. The rate showed a significant reverse periodicity during the economic expansion period, and the negative impact of liabilities on investment was most significant during the economic expansion period.

This paper mainly studies the application of artificial intelligence and machine learning in the financial field from the front-end application oriented to customers [9-10], the background application of optimization operation and the management of transaction and portfolio management, so as to explore the favorable factors of artificial intelligence and machine learning in maintaining financial stability [11-12]. research on its necessity and deficiencies in supervision, the research finds that the application of artificial intelligence and machine learning in finance should be continuously improved, and the supporting supervision of artificial intelligence and machine learning in the financial industry should be strengthened.

2. Methods

2.1 The Application of Artificial Intelligence and Machine Learning in the Financial Field

Due to machine learning and complex data analysis models, data sources are no longer limited to traditional credit data (structured data), but new types of social media, communication tools and other new data (unstructured or semi-structured). This not only benefits more people who do not enjoy traditional financial services, but also qualitatively analyzes borrowers' consumption behaviors and willingness to pay, so as to quickly and accurately classify borrowers and improve the efficiency of loan decisions. In addition, machine learning-based big data analysis, by integrating real-time, highly refined data to identify high-risk cases, and provide more competitive pricing and improved marketing. At the same time, artificial intelligence and machine learning can increase underwriting and claims efficiency, reduce operating costs and increase profitability. The chat bot is a virtual human assistant that helps customers with business or solve problems. These automated programs communicate with customers using natural language processing methods (via text or voice) and continue to improve themselves with machine learning algorithms. Some financial services companies have introduced chat bots on mobile apps or social media. At present, the services provided by chat bots are still relatively primitive, such as providing customers with balance information. In the future, chat bots will provide more consulting services to help customers make financial decisions.

2.2 Application of Artificial Intelligence and Machine Learning in the Background of the Financial Field

Artificial intelligence and machine learning tools help banks improve the efficiency, accuracy and speed of capital optimization. At present, a number of financial institutions have launched risk-weighted assets (RWA) optimization projects with an optimization rate of 5% to 15%. Capital
optimization is also applied to the Derivative Margin Value Adjustment (MVA) optimization, which meets the capital and initial margin requirements for clearing and bilateral settlement net regulatory requirements. Banks use machine learning to analyze large amounts of unstructured or semi-structured data and adjust policies accordingly. Among them, the bank reduces the possibility of underestimating the risk by setting a series of financial operating conditions, considering market trends and other trends. In terms of stress testing, large financial institutions collaborate with third-party service providers of artificial intelligence and machine learning to jointly develop modeling tools for capital market stress testing, and to control and reduce the number of variables in the scenario of default loss scenarios. In a machine learning mode without manual supervision, analyze large amounts of data and compare different combinations of variables to obtain a more transparent and more accurate model. Artificial intelligence and machine learning applications complement market impact analysis. Enterprises use artificial intelligence to extract information from limited sample data, identify potential nonlinear relationships in trading orders, and reduce the impact of large transactions on price and liquidity. In addition, companies apply machine learning techniques to “Trading robots” and learn how to respond to market changes. Machine learning is also used in the bond market to accurately assess bond liquidity and price volatility by identifying and studying similar bonds.

2.3 Application of Artificial Intelligence and Machine Learning in Financial Field Trading and Investment Management

Using artificial intelligence and machine learning, analyzing customer transaction historical data, predicting customer transaction needs, and improving the trading ability of seller organizations. At the same time, artificial intelligence and machine learning applications help trading companies manage their exposure. For example, large trading companies such as banks use central risk trading accounts or risk management techniques based on big data analytics to centrally manage risk to meet corresponding capital requirements. In addition, artificial intelligence and machine learning can enhance transaction compliance management to meet the transparency requirements of non-stock markets before and after transactions. In portfolio management, artificial intelligence and machine learning tools can discover new price fluctuations, improve data usage efficiency and market research, and increase investment yields for buyer organizations.

3. Results and Discuss

3.1 Is Conducive to Maintaining Financial Stability

The application of artificial intelligence and machine learning in the field of financial services will help to improve the stability of the financial system by improving service efficiency and strengthening the control of compliance and systemic risks. First, it helps to improve the efficiency of the financial system and the flexibility of the financial market. Through the application of artificial intelligence and machine learning, the processing of credit risk information will be more efficient and the cost of customer interaction will be lower. At the same time, it helps to reduce price distortions and herding effects in financial markets. The second is to help the organization's internal control and compliance management. Artificial intelligence and machine learning applications will help organizations strengthen risk management, fraud identification and compliance management, thereby reducing associated costs. The third is to help improve regulatory efficiency and better analyze the systemic risks of financial markets.

3.2 Not Conducive to Maintaining Financial Stability

The first is to spawn new systemically important institutions. Future network effects and the spread of new technologies will lead to excessive dependence of financial institutions on third parties. Artificial intelligence and machine learning services are increasingly concentrated in the hands of a few large technology providers, which will lead to the participation of new systemically important financial and new technology markets. By. The second is to increase the source of systemic risks. Financial institutions tend to choose Third-party technology vendor based on factors such as reputation, scale, and technology, which also promotes the formation of monopoly institutions. When these suppliers with a large share of a particular financial market have major
problems or fail, they will have a systemic impact on financial institutions that are dependent or associated with them. Third, there is a lack of compliance supervision at this stage. The current suppliers of artificial intelligence and machine learning technology in the financial sector have not yet been included in the scope of financial supervision. The outsourcing of artificial intelligence and machine learning for financial institutions' key functional systems has not been effectively regulated.

3.3 Strengthening the Need for Artificial Intelligence and Machine Learning Supervision

First, due to the lack of “interpretable” or “auditability” of artificial intelligence and machine learning technology, if not properly regulated, it will create a large risk potential at the macro level. For example, if multiple financial institutions use their artificial intelligence and machine learning models that cannot be accurately explained to formulate trading strategies, it will be difficult for regulators and financial institutions to predict the impact of model-determined transactions on the market. When the market is flooded with decisions based on models, its interactions and effects are likely to have unpredictable negative effects on financial markets. Second, the ability to deal with extreme situations is poor. Many artificial intelligence and machine learning techniques are based on practical experience in a low-volatility economy, simulating the best response to learning. If a serious economic downturn or financial crisis occurs, the above technical procedures will be difficult to deal with long-term risks. Make the right decision. It can be seen from figure 1 that the scale of the global artificial market is gradually increasing every year, indicating that the application of artificial intelligence is more extensive, and it is more important to supervise it.

3.4 Insufficient Internal Control and Supervision

First, it is difficult for financial institutions to achieve effective internal control. The FSB survey shows that some financial institutions have proposed artificial intelligence and machine learning applications to challenge effective internal auditing, and there are still many problems in understanding and monitoring artificial intelligence and machine learning. Second, there are insufficient financial supervision resources and means. The FSB survey shows that financial supervisory authorities lack the necessary resources and technical means to properly supervise the application of artificial intelligence and machine learning. The regulatory authorities do not yet have the skills and expertise to review relevant models; some regulatory authorities have suggested the need for manual. The development and prospects of intelligent and machine learning applications are investigated and evaluated, and relevant applications are evaluated.

4. Conclusion

The application of artificial intelligence and machine learning in the financial system helps to
enhance financial stability and improve the efficiency of financial supervision and systemic risk monitoring. Among them, the first is the improvement of credit risk information processing efficiency and the reduction of customer interaction costs, which helps to improve the overall efficiency of the financial system. Second, it is conducive to the improvement of risk management and compliance monitoring in the middle and back office. The third is to improve the efficiency of information processing in the investment field and improve the efficiency and resilience of the financial market. Fourth, it is beneficial for supervisory authorities to improve regulatory efficiency and better implement systemic risk monitoring. But at the same time, it also faces corresponding challenges. First, it has increased the dependence of the financial industry on third-party institutions related to technology. If such institutions form a monopoly, insufficient market competition may turn into financial stability risks. Second, because third-party institutions are not included in financial supervision, and are not familiar with financial regulatory laws and regulations, financial services provided by third-party institutions may be outside the regulatory boundaries and difficult to supervise in time. Third, models based on artificial intelligence and machine learning are extremely complex and generally lacking in interpretability. It is difficult for developers and users to predict how these applications will affect the market, or it will bring unexpected impacts to financial market stability and cause systemic risks at the macro level.

At this stage, on the basis of effectively assessing the application risks of artificial intelligence and machine learning in the fields of data privacy, operational risk, and network security, the interpretability of artificial intelligence and machine learning related application models is continuously improved, and artificial intelligence and The supporting supervision of machine learning in the financial industry.

References