



American Journal of Environmental Economics (AJEE)

ISSN: 2833-7905 (ONLINE)

VOLUME 4 ISSUE 1 (2025)



PUBLISHED BY
E-PALLI PUBLISHERS, DELAWARE, USA

Analysis of Financial Policy of China's Economy Based on Artificial Intelligence and Innovation

Yuan Mengying¹, Zhao Yuhan^{1*}

Article Information

Received: October 19, 2024

Accepted: November 22, 2024

Published: April 22, 2025

Keywords

Artificial Intelligence, Economy and Finance, Policy Analysis

ABSTRACT

In the context of the rapid development of globalization and digitalization, China's economy faces complex and changeable challenges and opportunities. Artificial intelligence (AI), an important technology in the modern economy, has shown great potential in many fields, especially in formulating and implementing economic and financial policies. This paper explores how artificial intelligence and innovation can reshape China's economic and financial policies. Through reviewing relevant academic journals, books, policy reports, etc., to sort out existing research results and identify key topics and theoretical frameworks in the research. To systematically review and analyze existing theoretical and empirical studies on AI, innovation and their impact on economic and financial policies. Utilize AI techniques to extract valuable information from large amounts of data to support policy analysis. Analyze specific cases and explore practical experiences of successful application of AI and innovation to economic and financial policies.

INTRODUCTION

Since the reform and opening up, China's economy has experienced rapid and profound development and has become the second largest economy in the world. However, with the change in the global economic environment, the traditional economic growth model has gradually exposed many problems, especially in the face of financial risks, inefficient allocation of resources, and insufficient innovation ability. Therefore, promoting innovation and the transformation of economic and financial policies has become an urgent problem that needs to be solved. The rise of artificial intelligence (AI) technology provides new ideas and methods for this transformation. Artificial intelligence technology, covering machine learning, data mining, natural language processing and other fields, its application in information processing, decision support and intelligent forecasting, etc., is changing the way the economic and financial fields operate. Through in-depth analysis of large amounts of data, AI can not only improve the efficiency of policy making, but also enhance the scientific and targeted nature of policies. In addition, the application of artificial intelligence in financial services, risk management and market regulation is leading new economic and financial changes.

LITERATURE REVIEW

In recent years, the Chinese government has attached great importance to the development of financial technology and introduced a series of policy measures to promote scientific and technological innovation. The core intention of the policy is to use modern science and technology to promote high-quality economic development and realize the transformation and upgrading of the economic structure. However, there

are still a series of problems in the implementation of the policy. How to effectively embed artificial intelligence technology to support scientific and intelligent economic and financial policies has become the focus of research. With the rapid penetration of artificial intelligence technology into various fields of society, the research of artificial intelligence on employment, industrial integration, economic growth and other aspects is increasing day by day. For example, Autor *et al.* (2001) conducted an empirical study based on the combination of robot data and macro data and found that the use of robots promoted economic growth (Longpeng & Shuangzhi, 2020). When studying the impact of artificial intelligence on total employment, Acemogl *et al.* found that substitution effect and creation effect played an important role (Li *et al.*, 2024; O'Leary, 1991). Zhang Longpeng *et al.* found that the integration of artificial intelligence and manufacturing industry is constantly improving (Qin & Li, 2023). Although there are many kinds of studies, there is no consensus on the impact of artificial intelligence on economic development (such as Aghion & Howitt, 1994; Xianpeng & Haoxuan, 2024; Autor *et al.*, 2001). Artificial intelligence also has a significant impact on the employment structure, which is mainly reflected in the job polarization effect, that is, technological progress mainly replaces the middle-skilled labor force, which tends to decrease the proportion of middle-skilled workers while the proportion of high-skilled workers increases (e.g. Iijun An & Жядро, 2023). As for the cause of employment polarization, some scholars believe that high-skilled workers are engaged in complex and irregular labor, and low-skilled workers are engaged in simple and irregular labor. Compared with medium-skilled workers, the two are more difficult to be

¹ Belarusian State University, Minsk, Belarus

* Corresponding author's e-mail: yuhanzhao375@gmail.com

replaced by machines, and they are distributed at both ends of the job skills, resulting in employment polarization. Empirically, many scholars have verified the phenomenon of employment polarization by studying the employment situation of different countries. The research shows that the phenomenon of employment polarization already exists in the United States, Western Europe, and other countries and regions. Yongqin *et al.* (2024) found that

industrial robots have a significant substitution effect on the middle-skilled labor force in China's manufacturing industry. The purpose of this study is to systematically review the literature related to artificial intelligence and economic development and to review the application of artificial intelligence to employment, economic growth, industrial integration, and other aspects in order to form a more comprehensive overall view of this field.

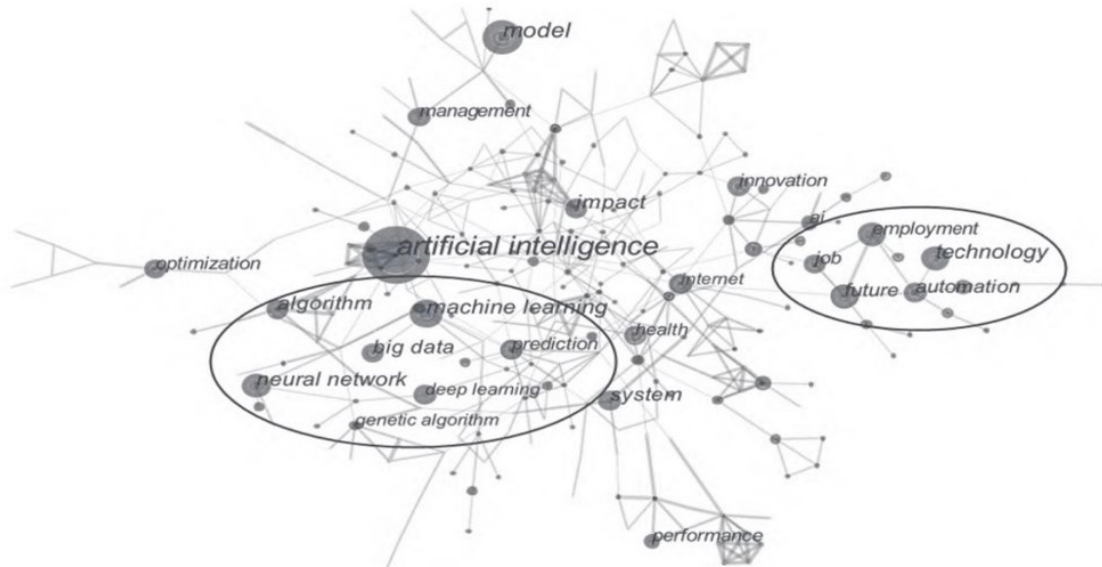


Figure 1: The co-occurrence knowledge graph of foreign research keywords on artificial intelligence and economic development from 2003 to 2024

In addition, based on WoS journal analysis, it can be found that foreign scholars have rich and closely related keywords involved in research in this field, among which the keywords that pay more attention are “artificial,” “model,” “technology,” and “intelligence.” The main focus of foreign scholars on learning “big data” and “impact” can be divided into two categories: one is the technology field related to artificial intelligence; Another type is the impact of artificial intelligence on employment, which is similar to the focus of Chinese scholars. In addition, foreign scholars are particularly interested in the predictive capabilities of artificial intelligence and its relationship with innovation. This also reflects from the side that the theme of domestic research on the impact of AI on the economy is relatively centralized, while foreign research shows a diversified trend, so it is necessary to encourage the diversified development of China's AI from other perspectives such as technology manufacturing integration application, innovation prediction, etc.

The Development of Artificial Intelligence

Starting from the Dartmouth Conference in 1956, artificial intelligence has a research and application development history of over 60 years. During this process, we experienced three waves of development. The first rise of computers originated from their ability to solve complex tasks that were originally only achievable by humans, such as algebraic application problems, proving

geometric theorems, learning and using English, and so on. However, due to the incomplete algorithms and insufficient computer hardware capabilities at that time, artificial intelligence did not achieve the expected results and fell into a low point. The second rise of artificial intelligence came into people's sight with the concept of “expert systems”. The irreconcilable contradiction between the limitations of algorithm architecture and the high complexity of actual production business seriously reduces the practical value that artificial intelligence can bring, causing it to once again enter a state of silence.

Since the second half of the 1990s until now, artificial intelligence has experienced its third rise. At this stage, the rapid development of the Internet and computer hardware industry has made great progress in the three core elements of algorithm, data and hardware that support the development of AI. At the algorithmic level, deep learning technology has developed rapidly in recent years, promoting the multi domain landing of artificial intelligence applications; At the data level, the massive data accumulation brought about by the development of the Internet provides a good data basis for the practice of artificial intelligence algorithms; At the hardware level, new generation chips such as GPU (Graphics Processing Unit) and TPU (Tensor Processor), as well as new hardware facilities such as FPGA (Field Programmable Gate Array) heterogeneous computing servers, are also being widely used for specialized artificial intelligence computing.

At present, artificial intelligence technologies and algorithms represented by deep learning, computer vision, natural language processing, and reinforcement learning are accelerating innovation and breakthroughs. Various artificial intelligence technologies have established a phased research and application foundation, promoting many business and life scenarios to become smarter and more efficient, especially in the fields of finance, retail, manufacturing, healthcare, security, transportation, etc.,

giving rise to many new formats and business models, which are having a profound impact and transformation on the digital transformation of these industries. Overall, from algorithms to hardware, artificial intelligence technology still has broader development prospects. In the process of accelerating the implementation of various technological applications, the development of artificial intelligence technology in the future will be promoted by both scientific research and commercial applications.

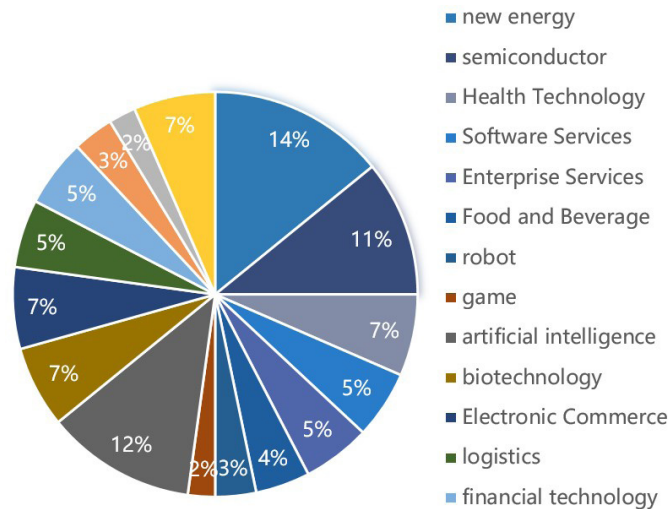


Figure 2: Distribution of unicorn numbers in China in 2024

Note: In the fields of business and finance, "unicorn" specifically refers to non publicly listed companies that grow rapidly in their early stages and have a market value exceeding \$1 billion

Concept of China's Economic and Financial Policies

China's economic and financial policies refer to a series of measures and policies taken by the Chinese government to promote economic development and maintain financial stability. These policies aim to regulate economic operations, promote economic growth, maintain healthy development of financial markets, and address domestic and international economic and financial risks.

Macro control is an important component of China's economic and financial policies. The Chinese government adjusts its monetary policy, fiscal policy, and industrial policy to influence the overall size and structure of the economy, in order to achieve economic growth and stability. Monetary policy mainly controls the money supply and liquidity by adjusting interest rates, reserve requirement ratios, and credit policies to achieve the goals of stabilizing prices and promoting economic growth. Fiscal policy regulates economic operation and promotes economic development by adjusting taxes and expenditures. Industrial policy refers to the government's support and guidance for different industries to promote industrial upgrading and structural optimization. Financial reform is an important component of China's economic and financial policies. Through financial system reform, the Chinese government has promoted the opening and development of financial markets, and improved the competitiveness and service level of financial institutions. Financial reform includes promoting interest rate liberalization, advancing exchange rate liberalization,

deepening financial market reform, and strengthening financial supervision. The Chinese government hopes to improve the efficiency and risk management capabilities of financial institutions through financial reform, promote the healthy development of the financial market, and provide better financial services and support for the real economy.

The Current Situation of China's Economic and Financial Policies

Against the backdrop of continuous changes and development in the global economy, China's economic and financial policies have undergone continuous adjustments and optimizations to cope with the complex internal and external environment. In recent years, China's economic development has faced multiple challenges, including a global economic slowdown, weak domestic demand, and increased financial risks. Therefore, the country has carried out a series of reforms and innovations in economic and financial policies to achieve high-quality development.

Adaptive Adjustment of Monetary Policy

As the central bank, the People's Bank of China is responsible for formulating and implementing monetary policies to maintain the moderate growth of the money supply, stabilize prices, and promote employment. In recent years, facing the pressure of slowing economic growth, the People's Bank of China has adopted a flexible and moderate monetary policy.

Positive Expansion of Fiscal Policy

In terms of fiscal policy, the Chinese government actively takes measures to promote economic development in the context of “stable growth”. The government has increased fiscal expenditure by increasing infrastructure investment, promoting new urbanization, and upgrading industrial structure.

Standardization and Opening up of Financial Markets

China’s financial market has gradually formed a relatively complete system in the process of continuous development. The securities, bond, insurance, and foreign exchange markets are gradually moving towards standardization, marketization, and transparency. In order to improve the openness of the financial market, the country actively promotes the reform of the capital market and encourages foreign investment to enter.

Risk Prevention and Control Measures

With the rapid development of the economy, the importance of financial risk management is increasingly prominent. In recent years, the Chinese government has focused on strengthening financial regulation, especially in areas such as shadow banking and the real estate market. By refining regulatory policies, strengthening stress testing and liquidity management for financial institutions, China has to some extent curbed the trend of rising corporate leverage ratios.

Motivate Innovation and Promote Transformation

To promote high-quality economic development and industrial transformation, the Chinese government has formulated a development strategy driven by innovation. Various financial policies have been tilted towards supporting key areas such as technological innovation and green finance. For example, in terms of venture capital and private equity, the government has introduced corresponding tax incentives to encourage funds to invest in high-tech enterprises.

Policy Interaction from a Global Perspective

Faced with the complex international economic situation, China actively participates in global economic governance

and engages in mutually beneficial cooperation with other countries. By enhancing cooperation with international financial organizations, China actively participates in the formulation and improvement of global financial rules.

The Application of Artificial Intelligence in Financial Policy Analysis

With the rapid development of artificial intelligence (AI) technology, the ways and means of financial policy analysis are undergoing profound changes. AI not only improves the efficiency of data processing, but also provides more accurate prediction and decision support capabilities, making the formulation and implementation of financial policies more scientific and reasonable.

The core advantage of artificial intelligence lies in its powerful data processing capabilities. Financial policy analysis relies on massive amounts of data for decision-making, and AI technology can quickly extract and analyze big data to identify potential economic trends and risk points. For example, by applying machine learning algorithms, analysts can monitor in real-time the impact of economic indicators, financial market dynamics, and policy changes on the market in a rapidly changing market environment. This ability significantly improves the timeliness and accuracy of policy analysis.

By building complex models, AI can identify and predict potential risks in financial markets, such as credit risk, market risk, and liquidity risk. This predictive ability enables policy makers to prepare contingency measures in advance. Taking credit risk as an example, AI can analyze borrowers’ historical data to evaluate their credit worthiness, help financial institutions optimize credit policies, and reduce default risk. By utilizing deep learning techniques, researchers can establish multidimensional models covering macroeconomic indicators, industry data, and market sentiment, and simulate economic trends under different policy scenarios through simulation. This model not only improves the accuracy of predictions, but also makes policy-making more comprehensive and rational.

The widespread application of artificial intelligence in the field of financial technology has further promoted the development of financial policy analysis. Many financial

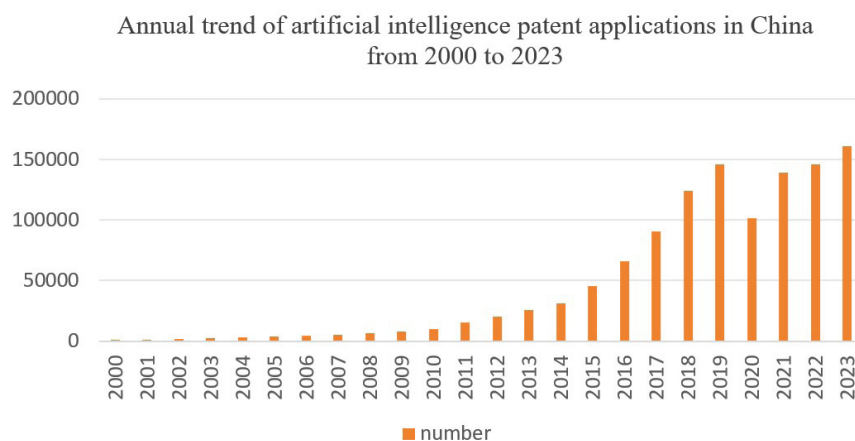


Figure 3: Annual trend of artificial intelligence patent applications in China from 2000 to 2023

institutions are beginning to utilize AI technologies such as chatbots and intelligent customer service systems to provide personalized services and advice. By analyzing customer needs and behaviors, financial institutions can develop targeted financial policies for different types of customers, which not only improves customer satisfaction but also provides practical reference for policy adjustments.

In the modern financial field, the rapid development of artificial intelligence (AI) and machine learning (ML) technologies has provided new perspectives and tools for financial policy analysis. AI can process large amounts of financial data, conduct in-depth analysis, and provide decision support, helping decision-makers make accurate decisions in complex economic environments. The powerful computing power of artificial intelligence makes it an ideal tool for processing and analyzing massive amounts of financial data. Traditional methods often struggle to effectively handle data diversity and complexity, while AI algorithms can quickly analyze historical data, identify patterns, and provide meaningful insights for policy makers.

Actual Case: Federal Reserve System (Fed) of the United States

The Federal Reserve System (Fed) uses AI technology for economic data analysis to guide its monetary policy decisions. For example, the Fed has developed an AI tool called "Point of View" that uses big data analysis technology to monitor and analyze multiple dimensions of indicators such as economic trends, labor markets, and consumer confidence in real time, helping decision-makers adjust interest rates and monetary policy more accurately. This data-driven decision-making process enhances the speed and effectiveness of policy responses.

Actual Case: J.P. Morgan

JPMorgan Chase has introduced AI algorithms in risk management, particularly in credit risk assessment. The bank uses machine learning technology to analyze borrowers' credit records, transaction behavior, and social media data to predict their default risk. AI models can identify risk factors that traditional credit scoring models cannot capture, thereby helping JPMorgan Chase better manage its credit portfolio. In addition, they also introduced AI algorithms to analyze risks during market turbulence, in order to adjust investment strategies in a timely manner.

Actual Case: Goldman Sachs

Goldman Sachs uses machine learning technology to conduct market forecasting, in order to better understand market changes and future trends. They use AI to analyze social media, news reports, and research reports to obtain market sentiment and influencing factors. AI algorithms can not only quickly aggregate and analyze large amounts of unstructured data, but also provide forward-looking insights into upcoming market changes. Especially during

periods of economic volatility and market turbulence, Goldman Sachs' AI tools can quickly capture changes in market sentiment and provide support for trading strategies.

RESULTS AND DISCUSSION

The integration prospects of artificial intelligence and financial policies

In this study, the analysis is carried out with the help of secondary data, including statistics from major organizations, academic articles, industry reports and government releases. These data are mainly related to the following aspects:

Artificial Intelligence Patent Application Data: contains patent applications for various types of AI technologies in China during the period 2000-2023, reflecting technology innovation trends.

Financial market data: covering key economic indicators such as interest rate changes, consumer confidence index, market demand and economic growth rate.

International case data: including the practical experience and effectiveness of AI applications in the U.S. and U.S.-based banks (such as JPMorgan Chase and Goldman Sachs).

We used a combination of quantitative and qualitative methods to analyze the collected data, applying statistical methods to regression analysis of annual trends in patent applications and other economic indicators to identify correlations and trends.

Through case studies, we analyze the specifics and effects of AI applications by different financial institutions, and distill the elements of success and innovation.

With the continuous advancement and widespread application of artificial intelligence (AI) technology, the formulation and implementation of financial policies face new opportunities and challenges. The introduction of AI not only provides more efficient data analysis and decision support for financial markets but also powerful tools for policy makers to predict and monitor in the economic and financial fields. Especially in a rapidly developing economy like China, the integration of AI and financial policies will have a profound impact on economic and financial development.

By analyzing Internet data, the government can grasp consumer confidence, market demand and other information in real time, so as to formulate more intelligent and timely economic and financial policies. China's financial regulators can use AI tools to monitor market fluctuations in real time, adjust regulatory policies in time, and prevent financial foam and system risks. Through intelligent risk assessment and credit approval, more small and micro enterprises and individuals will be able to obtain financing support, thereby promoting comprehensive economic development. In addition, AI technology will also drive the development of digital currencies and blockchain technology, bringing new opportunities to China's financial system.

In order to fully utilize the positive role of AI in financial policies, the Chinese government and financial regulatory agencies can consider the following suggestions and implementation directions:

Improve Laws and Regulations

The primary task is to establish and improve relevant laws and regulations in response to the characteristics of introducing AI technology into financial policies. The government should establish corresponding regulatory frameworks to ensure data security and privacy protection in the application process of AI. This will help enhance public trust in the application of AI in financial policies, while also protecting the healthy development of financial markets.

Strengthen Talent Cultivation

With the increasing popularity of AI technology, the demand for versatile talents in the financial field is gradually increasing. The government should increase its efforts to cultivate financial technology talents, strengthen cooperation between universities and financial institutions, and cultivate financial professionals with AI technology backgrounds. The cultivation of talents will provide stronger support for policy implementation and technological application.

Encourage Innovation and Pilot Projects

The government can establish pilot projects to encourage financial institutions to actively explore the application of AI technology in financial policies. Through small-scale pilot projects, financial institutions can accumulate experience, find AI application scenarios that are suitable for their own and market needs, and provide reference for subsequent large-scale promotion.

Promote Cross Departmental Cooperation

The integration of AI and financial policies not only involves the tasks of the financial sector, but also requires cooperation from other relevant departments such as technology, education, and social security. Cross departmental collaborative policy-making will help establish a more comprehensive financial ecosystem, thereby improving the efficiency and response speed of financial policies.

CONCLUSION

The integration of artificial intelligence and financial policies provides enormous potential and opportunities for the development of China's economy and finance. By fully leveraging the advantages of AI, governments can formulate financial policies more accurately, manage financial risks more efficiently, and promote innovation and sustainable development. However, this process is also accompanied by challenges, which require efforts in legislation, talent cultivation, innovation pilot projects,

and cross departmental cooperation to promote the effective application of AI in financial policies. Only in this way can we ensure China's steady progress in the transformation of the global economic environment and the achievement of high-quality development goals. From data analysis and decision support, risk management to market forecasting and trend analysis, AI technology helps financial institutions make more scientific decisions in complex and changing environments. With the continuous advancement of AI technology, we have reason to believe that it will play a more important role in financial policy analysis in the future, helping to stabilize and promote the healthy development of financial markets. In the future, the effective application of AI technology has brought significant results, but the complexity of financial policy analysis still requires effective collaboration between human experts and AI to achieve optimal decision-making outcomes. Innovation driven economic and financial policies.

REFERENCES

- Aghion, P., & Howitt, P. (1994). Growth and unemployment. *The Review of Economic Studies*, 61(3), 477-494.
- Anifowose, F. A., & Eludiora, S. I. (2012). Application of artificial intelligence in network intrusion detection. *World Applied Programming*, 2(3), 158-166.
- Autor, D., Levy, F., & Murnane, R. (2001). *The skill content of recent technological change: An empirical exploration*.
- Furman, J., & Seamans, R. (2019). AI and the economy. *Innovation Policy and the Economy*, 19(1), 161-191.
- Holmes, J., Sacchi, L., & Bellazzi, R. (2004). Artificial intelligence in medicine. *Annals of the Royal College of Surgeons of England*, 86(5), 334-338.
- Li, J., Liu, Y., Shao, R., & Zhudro, M. K. (2024). Research on the economic security application of energy economy in a low-carbon sustainable development society. In *E3S Web of Conferences* (Vol. 497, p. 01007). EDP Sciences.
- Ли, Ц., & Жудро, М. К. (2023). *Research on point-to-point energy trading and transportation methods for potash fertilizers between China and Belarus*.
- O'Leary, D. E. (1991). Artificial intelligence and expert systems in accounting databases: Survey and extensions. *Expert Systems with Applications*, 3(1), 143-152.
- Qin, Y., & Li, J. (2023). Research on sustainable development of China's Green Enterprise Economy. *American Journal of Economics and Business Innovation*, 2(2), 86-92.
- Xianpeng, W., & Haoxuan, Y. (2024). Commercial economic value of non-metallic fiber concrete.
- Zhang, L., & Zhang, S. (2020). Technological empowerment: The technological innovation effect of the integration of artificial intelligence and industry development. *Financial Science*, 6, 74-88.