



Analysis of Artificial Intelligence-Driven Intelligent Investment Strategies and Their Market Effects

Mingze Qin

University College London, London, UK

Email: 1280538273@qq.com

Abstract. With the rapid development of technology, the application of artificial intelligence in the field of finance is becoming increasingly widespread. This paper deeply explores artificial intelligence-driven intelligent investment strategies, including the application of machine learning algorithms in investment decisions, the combination of quantitative investment and artificial intelligence, and the analysis of financial market information by natural language processing technology. At the same time, it analyzes in detail the market effects of intelligent investment strategies, such as improving investment efficiency, reducing risks, and improving market liquidity. Through the study of practical cases and theoretical analysis, it provides valuable references for investors and financial institutions and looks forward to the future development trend of artificial intelligence in the investment field.

Keywords: artificial intelligence; intelligent investment strategy; market effect; machine learning; quantitative investment

1 Introduction

In today's digital age, the development of artificial intelligence technology has brought profound changes to the field of financial investment. Traditional investment decisions mainly rely on the experience, analysis, and judgment of investors. However, artificial intelligence-driven intelligent investment strategies, with their powerful data processing capabilities, algorithm models, and learning abilities, provide investors with more scientific, efficient, and accurate investment decision support. The emergence of intelligent investment strategies not only changes the decision-making methods of investors but also has an important impact on the operating mechanism and market effects of financial markets. Therefore, in-depth research on artificial intelligence-driven intelligent investment strategies and their market effects has important theoretical and practical significance^[1].

2 Application Background of Artificial Intelligence in the Investment Field

2.1 The Advent of the Big Data Era

With the continuous progress of information technology, the financial market has generated massive amounts of data, including stock prices, financial statements, macroeconomic data, news and information, etc. Traditional data analysis methods are difficult to effectively process such a large amount of data^[2]. However, artificial intelligence technology, especially machine learning and deep learning algorithms, can quickly process and analyze big data, mine valuable information from it, and provide a basis for investment decisions^[3].

2.2 The Improvement of Computing Power

The development of high-performance computers and cloud computing technology provides powerful computing support for the application of artificial intelligence in the investment field^[4]. Machine learning algorithms require a large amount of computing resources for model training and optimization. The powerful computing power enables these algorithms to process more data in a shorter time and improve the efficiency and accuracy of investment decisions^[5].

2.3 The Complexity and Uncertainty of Financial Markets

The complexity and uncertainty of financial markets make traditional investment methods face challenges. Artificial intelligence technology can establish complex models through the learning and analysis of historical data to predict market trends and asset price changes and help investors better cope with market uncertainties^[6].

3 Artificial Intelligence-Driven Intelligent Investment Strategies

3.1 The Application of Machine Learning Algorithms in Investment Decisions

3.1.1 Supervised Learning Algorithms

Supervised learning algorithms are a method of training models using known input and output data to predict new input data. In the investment field, supervised learning algorithms can be used for stock price prediction, bond yield prediction, credit risk assessment, and other aspects. For example, using linear regression algorithms can establish a relationship model between stock prices and financial indicators to predict the trend of stock prices; using support vector machine algorithms can classify and evaluate the credit risk of bonds, as Fig. 1^[7].



Fig. 1. Intelligent Investment Platform Interface - Blue and White Harmony

3.1.2 Unsupervised Learning Algorithms

Unsupervised learning algorithms are a method of discovering the potential structure and patterns in input data without known output data through analysis and mining^[8]. In the investment field, unsupervised learning algorithms can be used for market clustering analysis, anomaly detection, theme mining, and other aspects. For example, using clustering algorithms can classify stocks in the stock market according to industry, market capitalization, and other characteristics to help investors with industry allocation and asset portfolio optimization; using anomaly detection algorithms can detect abnormal trading behaviors in the market in time to prevent risks^[9].

3.1.3 Reinforcement Learning Algorithms

Reinforcement learning algorithms are a method of continuously learning the optimal strategy to obtain the maximum reward through the interaction between the agent and the environment. In the investment field, reinforcement learning algorithms can be used for investment portfolio optimization, trading strategy formulation, and other aspects. For example, using reinforcement learning algorithms can let the agent trade in a simulated financial market environment. Through continuous attempts and learning, it can find the optimal trading strategy to achieve asset appreciation^[10].

3.2 The Combination of Quantitative Investment and Artificial Intelligence

3.2.1 The Concept and Characteristics of Quantitative Investment

Quantitative investment is a method of making investment decisions using mathematical models and computer technology. It establishes quantitative models through the analysis of historical data to predict market trends and asset price changes and formulates investment strategies. Quantitative investment has characteristics such as objectivity, systematization, and high efficiency, which can overcome the subjective emotions and cognitive biases of human investors and improve the accuracy and stability of investment decisions.

3.2.2 The Application of Artificial Intelligence in Quantitative Investment

Artificial intelligence technology can provide more advanced data analysis and model construction methods for quantitative investment. For example, using machine learning algorithms can mine and analyze a large amount of historical data, discover potential laws and patterns in the market, and establish more accurate quantitative models; using natural language processing technology can analyze unstructured data such as news and information and social media to extract valuable information and provide references for investment decisions.

3.3 The Analysis of Financial Market Information by Natural Language Processing Technology

3.3.1 The Concept and Application of Natural Language Processing Technology

Natural language processing technology is a technology that enables computers to understand, process, and generate human language. In the financial field, natural language processing technology can be used for news and information analysis, social media sentiment monitoring, company announcement interpretation, and other aspects. By analyzing these text data, extracting key information and sentiment tendencies provides support for investment decisions. The effectiveness of natural language processing in the financial field can be measured by a formula such as:

$$\text{effectiveness} = \alpha * \text{Accuracy of Information Extraction} + \beta * \text{Accuracy of Sentiment Analysis} \quad (1)$$

where α and β are weighting factors that can be adjusted according to the specific application scenario.

3.3.2 The Application of Sentiment Analysis in Investment Decisions

Sentiment analysis is an important application field of natural language processing technology. It can analyze the sentiment tendency in text, such as positive, negative, or neutral. In the investment field, sentiment analysis can be used to analyze the market sentiment in text data such as news and information and social media to help investors understand the optimistic or pessimistic sentiment in the market and adjust investment strategies accordingly. For example, if the market sentiment is overly optimistic, in-

vestors can appropriately reduce the allocation of risky assets; if the market sentiment is overly pessimistic, investors can look for undervalued assets for investment.

4 Market Effect Analysis of Intelligent Investment Strategies

4.1 Improving Investment Efficiency

4.1.1 Quickly Processing and Analyzing a Large Amount of Data

Artificial intelligence-driven intelligent investment strategies can quickly process and analyze massive amounts of financial market data and timely discover investment opportunities and risk signals in the market. Compared with traditional investment methods, intelligent investment strategies can make investment decisions in a shorter time and improve investment efficiency.

4.1.2 Automated Trading Execution

Intelligent investment strategies can realize automated trading execution, reducing human operation errors and delays. Through preset trading rules and algorithm models, intelligent investment systems can automatically conduct transactions when market conditions are met, improving the timeliness and accuracy of trading.

4.2 Reducing Investment Risks

4.2.1 Diversifying Investment Risks

Intelligent investment strategies can achieve asset diversification through machine learning algorithms and quantitative models, reducing the risk of investment portfolios. At the same time, intelligent investment systems can adjust asset portfolios in time according to market changes to further reduce risks.

4.2.2 Risk Warning and Control

Intelligent investment strategies can detect potential risk signals in real time through the monitoring and analysis of market data and take corresponding risk control measures. For example, when there are abnormal fluctuations in the market, intelligent investment systems can automatically reduce the allocation of risky assets or conduct hedging transactions to reduce investment risks.

4.3 Improving Market Liquidity

4.3.1 Increasing Market Participants

The emergence of intelligent investment strategies attracts more institutional investors and individual investors to participate in the financial market, increasing market liquidity. Intelligent investment systems can automatically conduct transactions according to market conditions, improving market trading activity.

4.3.2 Improving Trading Efficiency

The automated trading execution and fast decision-making ability of intelligent investment strategies improve trading efficiency, reduce transaction costs, and further improve market liquidity.

4.4 Impact on Market Price Discovery

4.4.1 Providing More Information and Analysis Perspectives

Intelligent investment strategies provide more information and analysis perspectives for the market through the analysis and mining of big data. This information and analysis can help investors better understand the supply and demand relationship and price trend of the market and promote market price discovery.

4.4.2 May Cause Market Fluctuations

The large-scale application of intelligent investment strategies may cause excessive market reactions and fluctuations. For example, when intelligent investment systems adopt the same trading strategy at the same time, it may lead to rapid rises or falls in market prices, affecting market stability.

5 Case Analysis of Intelligent Investment Strategies

5.1 Cases of Well-known Foreign Intelligent Investment Platforms

5.1.1 Wealthfront

Wealthfront is an American intelligent investment platform that uses machine learning algorithms and quantitative models to provide personalized investment portfolio suggestions for investors. Wealthfront's investment strategies include global asset allocation, tax optimization, risk management, and other aspects. Through the analysis of investors' risk preferences, investment goals, and financial status, Wealthfront formulates suitable investment portfolios for investors and adjusts them dynamically according to market changes.

5.1.2 Betterment

Betterment is also an American intelligent investment platform. Its investment strategy is mainly based on modern portfolio theory and passive investment concepts. Betterment provides low-cost and high-efficiency investment services through automated portfolio management and rebalancing. At the same time, Betterment also provides value-added services such as tax loss harvesting to help investors reduce tax burdens, as Table 1.

Table 1. Comparison of Functions of Intelligent Investment Platforms

Intelligent invest- ment platform	Key Features
Wealthfront	ML for asset allocation, risk assessment; personalized advice; tax optimization.
Betterment	ML for portfolio optimization; passive investment; personalized service; tax loss harvesting.
Danjuan Fund	ML for fund analysis; big data mining; personalized fund recommendations.
Qieman	ML for asset allocation; long-term investment; personalized planning; exclusive services for high-net-worth.

5.2 Cases of Domestic Intelligent Investment Platforms

5.2.1 *Danjuan Fund*

Danjuan Fund is a well-known domestic intelligent investment platform that provides a variety of strategy combinations and fund products to meet the needs of different investors. The investment strategy of Danjuan Fund is mainly based on quantitative analysis and big data mining. Through the analysis of the historical performance, risk indicators, and portfolio structure of funds, it recommends high-quality fund products and investment portfolios for investors.

5.2.2 *Qieman*

Qieman is another domestic intelligent investment platform. It emphasizes investor education and long-term investment concepts. Qieman helps investors achieve stable wealth growth by providing personalized investment plans and asset allocation suggestions for investors. The investment strategy of Qieman focuses on risk control and long-term asset appreciation. Through in-depth analysis and research on the market, it selects suitable investment products and timing for investors, as Table 2.

Table 2. Simple Advantages and Challenges of Intelligent Investment Strategies

Aspect	Advantages	Challenges
Data	Process large data; find value.	Noise, bias, privacy issues.
Decision	Efficiency, risk reduction, liquidity.	Model issues; distrust.
Adaptation	Adjust to market.	Style switch, policy changes.
Service	Personalized, customized.	Tech investment needed.

6 Challenges and Risks of Intelligent Investment Strategies

6.1 Data Quality and Reliability Issues

6.1.1 Data Noise and Bias

There is a lot of noise and bias in financial market data, which may affect the accuracy and reliability of intelligent investment strategies. For example, outliers, missing values, and incorrect data in historical data may lead to overfitting or underfitting of models, affecting the quality of investment decisions.

6.1.2 Data Privacy and Security Issues

Intelligent investment strategies require a large amount of financial market data and personal investor data, which involves data privacy and security issues. If data is leaked or misused, it may cause serious losses to investors.

6.2 Model Uncertainty and Risk Issues

6.2.1 Black Box Problem

Machine learning algorithms and quantitative models are often regarded as black boxes, and investors find it difficult to understand their decision-making processes and logics. This may lead to investors' distrust and concerns about intelligent investment strategies and increase the uncertainty of investment risks.

6.2.2 Model Overfitting and Underfitting Issues

In the model training process, overfitting or underfitting problems may occur. Overfitting refers to the model performing well on training data but poorly on new test data; underfitting refers to the model performing poorly on both training data and test data. These problems may affect the accuracy and stability of intelligent investment strategies.

6.3 Market Environment Change and Adaptability Issues

6.3.1 Market Style Switching

The style and trend of the financial market often change. Intelligent investment strategies need to have strong adaptability and flexibility to cope with changes in the market environment. If intelligent investment strategies cannot be adjusted and optimized in time, it may lead to a decline in investment performance.

6.3.2 Policy and Regulatory Changes

The financial market is greatly affected by policies and regulations. Changes in policies and regulations may have a significant impact on intelligent investment strategies. For example, tightening regulatory policies may limit the application scope and trading behavior of intelligent investment strategies and increase investment risks.

7 Future Development Trends of Intelligent Investment Strategies

7.1 Technological Innovation and Integration

7.1.1 Further Application of Deep Learning and Reinforcement Learning

With the continuous development of deep learning and reinforcement learning technologies, their applications in the field of intelligent investment will be more extensive and in-depth. Deep learning can be used to process more complex financial market data and model construction, improving the accuracy and stability of investment decisions; reinforcement learning can be used to optimize investment portfolios and trading strategies to achieve maximum asset appreciation.

7.1.2 Multimodal Data Fusion

Intelligent investment strategies will increasingly integrate multimodal data, including text data, image data, audio data, etc. Through the analysis and mining of multimodal data, more comprehensive and accurate information support can be provided for investment decisions. For example, combining news and information, social media, satellite images, etc., can better understand the company's operating conditions, market sentiment, and macroeconomic environment, thereby making more scientific investment decisions.

7.2 Personalization and Customization Services

7.2.1 Personalized Investment Suggestions Based on Investor Portraits

In the future, intelligent investment platforms will pay more attention to the personalized needs of investors. Through the analysis of investors' risk preferences, investment goals, financial status, etc., personalized investment suggestions and asset allocation plans will be provided for investors. At the same time, intelligent investment platforms can also dynamically adjust investment strategies according to investors' feedback and market changes to improve the quality and satisfaction of investment services.

7.2.2 Customized Investment Products and Services

With the continuous diversification of investor needs, intelligent investment platforms will provide more customized investment products and services. For example, customized fund products for specific industries, themes, or investment styles; providing exclusive investment advisory services and wealth management plans for high-net-worth investors.

8 Conclusion

The application of artificial intelligence-driven intelligent investment strategies in the financial field brings new opportunities and challenges to investors. Through means such as machine learning algorithms, quantitative investment, and natural language processing technology, intelligent investment strategies can quickly process and analyze a large amount of data, improve investment efficiency, reduce risks, and improve market liquidity. However, intelligent investment strategies also face problems such as data quality and reliability, model uncertainty and risk, and changes and adaptability of the market environment. In the future, with the continuous innovation and integration of technologies, intelligent investment strategies will be more personalized, customized, and compliant, providing investors with better investment services. At the same time, regulatory agencies also need to strengthen the supervision of intelligent investment strategies to ensure the stability of financial markets and the legitimate rights and interests of investors. In the era of artificial intelligence, investors and financial institutions should actively embrace intelligent investment strategies, give full play to their advantages, and also recognize their risks and challenges. Reasonably use intelligent investment strategies to achieve stable asset appreciation.

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