

Research on Exploring the Path of Financial Risk Management and Standardization Based on Artificial Intelligence Technology and Intelligent Investment Advisory Regulatory Framework

Yicheng Peng^{a,*}

Mergers & Acquisitions Practice, West Monroe Partners, New York, 10019, NY, USA

^ayicheng.peng0329@yahoo.com

**Corresponding author*

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Abstract: This paper discusses in detail the key role of intelligent investment advisor based on artificial intelligence technology in financial risk management and the difficulties encountered. With the help of leading AI technologies, including building user profile models, optimizing asset allocation, executing smart trades, and managing risks, intelligent investment advisors can provide investors with efficient and customized investment services. However, the use of these technologies has also given rise to new risks and challenges, such as information security problems, technical failures, etc., which must be addressed through the establishment of effective regulatory mechanisms and enhanced risk management. Therefore, the main objective of this paper is to explore how to strengthen the risk management of Internet finance, especially intelligent investment advisers, by building a comprehensive and effective regulatory system in a highly technological context. To this end, this paper will deeply analyze the main risk points faced by intelligent investment advisers, study the specific application of artificial intelligence in risk identification and management in detail, and propose a series of practical regulatory measures and regulatory strategies. It is hoped to provide valuable reference and guidance for the stable and orderly development of the intelligent investment advisory industry.

1. Introduction

With the rapid development of artificial intelligence technology, AI has become a key force in promoting digital transformation in the financial sector. With advanced technologies such as Chat GPT and AI digital people, the intelligent investment advisory industry has ushered in significant progress, contributing significantly to the landing of inclusive finance and personalized services. However, this development also presents new challenges for financial regulation. In the era of "AI+finance" integration, how to conduct reasonable scientific and technological control of intelligent investment advisers to ensure the stability of the financial market and promote financial innovation has become an urgent problem for the industry to solve. While regulators have yet to issue detailed

regulations on smart investment advisers, current research on smart investment advisory regulation, while touching on existing issues, lacks in-depth discussion of regulatory principles and offers no practical solutions. By integrating financial technology and intelligent investment to take into account the regulatory elements, this paper hopes to provide a valuable reference for solving the regulatory problems of intelligent investment advisers.

2. AI Technology in Intelligent Investment Advisory

With the rapid progress of the global intelligent advisory, the domestic demand for investment advisory services continues to grow, and the concept of online financial management is also popular, so the business model of digital advisory came into being in China. The development wave of financial technology, from Internet finance to the rise of bitcoin, blockchain and other technologies, has promoted the vigorous development of intelligent advisory services, so far more than 50 enterprises and institutions involved in this field. At present, China's intelligent investment advisory market is mainly composed of Internet companies, professional intelligent investment advisory companies, as well as traditional financial institutions such as banks, brokerages and funds. Internet companies have a foothold with their powerful data processing capabilities, while traditional financial institutions have a foothold with their deep customer resources.

In intelligent financial services enterprises, such as Blue Ocean Intelligent Investment, Financial whale, Xuanji, Micai, etc., their intelligent investment advisory applications were carried out earlier, and they were supported by funds in the early stage, so that they invested a lot of resources in the research and development of models and algorithms. On the other hand, most of the intelligent advisory products of Internet finance companies, such as help you invest, Jingdong Intelligent Investment, Baidu stock market Pass, etc., can be regarded as upgraded versions of online advisory services, mainly to configure various types of domestic public fund products.

Compared with these two types of intelligent advisers, although traditional financial institutions face the challenge of model transformation, they have a stable customer base, rich internal resources and a large amount of historical data, so they have a significant late-mover advantage in the world. China Merchants Bank's Capricorn Intelligent Investment, Industrial and Commercial Bank of China's AI investment, Bank of Jiangsu's Alpha Intelligent Investment, Ping An One account, Harvest Gold Beta and Pudong Development Bank's wealth intelligent robot, etc., are leaders in this field. In particular, intelligent advisors of traditional banking financial institutions represented by Capricorn Intelligent Investment and AI investment have shown high application value with their huge customer and financial data resources.

2.1. Specific Applications of AI Technology

In the field of intelligent investment advisory, the application of artificial intelligence technology has penetrated into every business link, and its impact is both far-reaching and critical. When AI is combined with big data technology, it is possible to deeply explore and parse clients' investment preferences, risk tolerance, and their overall financial situation. This depth of data analysis allows us to build an accurate personal portrait of our clients. This portrait not only accurately reveals the unique needs of each client, but also provides a solid foundation for us to provide personalized investment advice to each client. Further, with these exhaustive customer profiles, AI technology can deploy its advanced machine learning algorithms to perform continuous and dynamic analysis of various investment assets. This analysis enables intelligent optimization of asset allocation, ensuring that it can more accurately match the client's investment objectives and risk tolerance.

At the same time, AI technology has also played a pivotal role in the real-time monitoring of financial markets. With preset trading strategies, AI can quickly and accurately execute buying and

selling operations, which not only significantly reduces human intervention, but also reduces transaction costs, significantly improving the accuracy and overall efficiency of trade execution. What is more worth mentioning is that the application of AI technology in the field of risk management is also an absolute. Through in-depth analysis of huge historical data, it can use its strong data analysis ability to accurately identify potential market risks, so as to provide investors with a more robust investment strategy.

2.2. Advantages Brought by AI Technology

The application of new technologies such as cloud computing, artificial intelligence and big data has injected strong impetus into the continuous innovation of the financial industry. In the current digital era, the average individual investor has become accustomed to accessing various financial services through digital channels. For important customers of commercial banks, intelligent advisers have become a useful assistant. These advanced technologies in the application process of intelligent investment advisory in traditional financial institutions in China, combined with people's professional experience and judgment, so that this foreign investment advisory model has shown a new look in China. Different from the trend of "dehumanization" in foreign countries, China's intelligent investment advisers have realized localization innovation and development after integrating human factors. For this reason, many commercial banks, regardless of their size, are actively involved in this field to explore and practice, hoping to improve and enhance traditional investment advisory services through intelligent investment advisory, which undoubtedly indicates that intelligent investment advisory will become an important trend in China's wealth management market.

3. Intelligent Investment Advisory Regulatory Framework

3.1. Regulatory Status and Issues

Currently, the regulation of intelligent investment advisory faces various challenges, as shown in Table 1 below. As a new financial service model, its business boundaries and nature are not yet clear, making it difficult for regulatory authorities to regulate effectively. Additionally, the algorithms and investment advice involved often require complex financial knowledge and technology, requiring regulatory authorities to have corresponding professional capabilities and technical means to regulate effectively. Furthermore, the cross-industry and cross-market characteristics of intelligent investment advisory increase the difficulty and complexity of regulation.

Currently, China's regulation of intelligent investment advisory is still in its infancy, and relevant laws and policies are not yet perfect. Although some guiding documents have put forward requirements for the regulation of intelligent investment advisory, there is still a lack of specific regulatory measures and details. This leads to blank areas and loopholes in the regulation of intelligent investment advisory in practical operations, making it difficult to fully protect the rights and interests of investors.

Table 1: Current situation and problems of intelligent investment advisory supervision

Issue	Causes	Market Impact	Investor Impact
Incomplete Regulatory Framework	Emerging nature of robo-advisors, lag in regulation development	Regulatory gaps and uncertainties in the market, potential for illicit activities	Inadequate protection of investor rights, susceptibility to losses
Difficulty in Cross-Industry Regulatory Coordination	Robo-advisors involve multiple financial sectors, overlap in regulatory functions among departments	Possible regulatory duplication or blind spots, affecting market efficiency	Investors may face multiple regulatory requirements, increasing investment complexity
Data Security and Privacy Concerns	Robo-advisors heavily rely on data, high risk of data leaks and misuse	Decreased market trust, impacting the development of robo-advisor services	Personal information leaks for investors, potential financial losses and privacy infringements
Algorithmic Model Risks	Complexity of algorithmic models, potential issues like inaccurate predictions, misleading investors	Increased market volatility, affecting market stability	Investors may suffer investment losses due to algorithmic errors

3.2. Construction and Main Contents of Regulatory Framework

For the supervision of intelligent advisers, it is essential to build a comprehensive, systematic and scientific regulatory framework. We need to clarify the department responsible for the supervision of intelligent advisers and specify in detail the scope of its regulatory responsibilities and powers. This step is fundamental to ensuring comprehensive and effective regulation of smart advisers. We should strengthen communication and cooperation with other financial regulatory authorities, form regulatory forces, and jointly promote the standardized development of intelligent investment services. The intelligent investment advisory platform shall formulate strict market access standards, and conduct careful review and evaluation of the platforms applying to enter the intelligent investment advisory market. This ensures that only platforms with the necessary qualifications and capabilities can provide services. At the same time, the daily supervision and inspection of the intelligent investment platform should be strengthened to ensure the compliance of its business operations and prevent potential risks. With the continuous advancement of technology, it is particularly important to carry out continuous technical supervision on the algorithmic models and investment recommendations of intelligent advisers. This requires the regulatory authorities not only to have advanced technical means, but also to have a regulatory team with professional literacy and technical capabilities. Therefore, strengthening the training and introduction of relevant technical talents is the key to enhance the supervision ability.

4. AI-Based Financial Risk Management

4.1. Financial Risks of Intelligent Investment Advisory

As an emerging force in the wave of financial technology, intelligent investment advisers use their unique algorithms and big data technologies to create customized investment advice and asset

management solutions for users. But just as a coin has two sides, while providing users with unprecedented investment convenience, intelligent investment advisers also bring a series of financial risks that cannot be ignored.^[1] The algorithmic model of the robo-adviser, as its core component, is highly dependent on data. The construction and optimization of the model need a lot of historical data as support. The quality of these data is directly related to the accuracy of model predictions and the effectiveness of investment recommendations. However, in reality, data collection and processing are often affected by many factors. Problems such as low data quality and sample deviation occur from time to time, which may lead to model prediction errors and bring economic losses to investors. What is more complicated is that the adjustment process of model parameters may also be affected by human factors, such as the subjective judgment of the operator, interest drive, etc., which may have adverse effects on the optimization of the model. Strategic choices in asset allocation, while often favoring diversification to spread risk, may not work in extreme market conditions. The violent fluctuations of the market and the sharp rise and fall of asset prices may make the asset allocation scheme of the intelligent investment adviser ineffective and unable to make effective adjustments in time. In this case, investors may face a serious risk of loss of their assets. Especially in today's increasingly interconnected global economy, economic turmoil in any one place can quickly spread to the whole world, bringing unpredictable risks to investors.

4.2. Application of AI Technology in Risk Management

Although it is true that intelligent investment advisers are accompanied by certain risks in the operation process, we cannot deny that artificial intelligence technology still shows its potential and broad prospects in the application of financial risk management. The introduction of artificial intelligence technology has greatly promoted the accuracy and efficiency of risk identification. This is because artificial intelligence technology can use big data analysis and machine learning algorithms to continuously monitor the market in real time, so as to capture every subtle change in the financial market, and then be able to find those potential risk factors in a timely manner.^[2] For example, through deep learning and analysis of huge historical data, artificial intelligence can accurately identify abnormal trading patterns or price fluctuations, so as to provide us with effective early warning before risks occur, so that we can prepare for market risks in advance. Of course, the role of artificial intelligence technology in risk control and prevention can not be ignored. Taking intelligent investment advisory as an example, artificial intelligence can monitor the dynamic changes of the market in real time, and then flexibly adjust the strategy of asset allocation, so that market risks can be effectively reduced. At the same time, artificial intelligence can also establish a set of perfect security protection system, so as to effectively prevent the occurrence of various technical risks. It can be said that financial risk management based on artificial intelligence not only has great potential, but also shows its incomparable advantages. However, we should also be soberly aware that artificial intelligence technology is not a panacea, and its application in financial risk management still faces many challenges and limitations. Therefore, while making full use of artificial intelligence technology, we also need to continuously improve our financial regulatory system, so as to improve the risk management level of the entire financial industry.

5. Standardization Path of Robot-Advisors

5.1. The Necessity and Practice of Standardization

Robo-advisors, as an emerging financial service model, are gradually occupying an important position in the market. However, due to the lack of clear industry standards, the development of robo-advisors faces many challenges and risks.^[3] Therefore, the standardized management of

robo-advisors is not only a necessary requirement to safeguard the rights and interests of investors but also a key factor in promoting the healthy and sustainable development of the robo-advisor industry.

In practice, we can see that some countries have begun to explore the path of standardizing robo-advisors. These practices mainly focus on several aspects: first, clarifying the legal status and business scope of robo-advisors, providing them with a clear regulatory framework; second, establishing an access mechanism for robo-advisors to ensure that institutions and individuals engaged in robo-advisor business have the corresponding qualifications and capabilities; third, strengthening the daily supervision of robo-advisor businesses to prevent violations; and finally, improving investor protection mechanisms to provide investors with effective risk prevention and dispute resolution channels.^[4] However, despite the achievements of these practices, the standardization of robo-advisors still faces many challenges. On the one hand, the algorithm models and risk control mechanisms of robo-advisors are not yet fully mature and need further improvement; on the other hand, there is still a certain gap in the understanding of robo-advisors between regulatory agencies and investors, which requires strengthened communication and education.

5.2. Specific Paths to Standardization

In order to effectively address the above challenges and drive the development of the intelligent investment advisory space in a more standardized direction, we can improve and implement strategies in the following four key areas. We can begin to strengthen the oversight of the algorithmic model of intelligent investment advisory. Specifically, the relevant financial regulatory authorities need to actively act to establish a detailed and rigorous algorithm audit and supervision mechanism. This mechanism should not only conduct regular and comprehensive evaluation and audit of the algorithm model used by the intelligent investment adviser to ensure that its decision-making process meets the requirements of laws and regulations, but also pay attention to its effectiveness and robustness in actual operation. In addition, we should actively promote the process of transparency of algorithmic models, so that investors can clearly understand the decision-making logic and process of intelligent advisers, thereby enhancing their trust in this new type of investment advisory. We also need to further improve the risk management mechanism of intelligent investment advisers. As a new financial service model, intelligent investment advisory provides convenient and efficient investment advisory services, but also inevitably faces a variety of potential risks such as market risk and credit risk. Therefore, intelligent investment institutions have the responsibility and obligation to establish a comprehensive and systematic risk management system and process. This includes, but is not limited to, regular assessment of various risks, setting up risk early warning systems and formulating targeted risk response strategies. Through these measures, we can ensure that the operations of the smart investment business are always kept on a safe and robust track. Strengthening investor education and protection is also a crucial task. Investors are the main beneficiaries and users of smart advisory services, so their interests should always come first. In order to achieve this goal, the regulatory authorities need to continuously increase investment and efforts in investor education, and improve investors' awareness and understanding of intelligent investment advisory services through various channels and methods. At the same time, we should also actively build a sound investor protection system, such as the establishment of a special investor protection fund, the establishment of a sound complaint handling and dispute resolution mechanism. These measures will provide investors with more comprehensive and effective risk prevention and rights protection. We should actively promote the process of self-regulatory management of the intelligent investment advisory industry. Industry self-discipline

is a key link to ensure the healthy and orderly development of intelligent investment advisers. We should encourage and support more intelligent investment institutions to join relevant industry associations or organizations and jointly participate in the development process of industry standards and norms. By strengthening the self-restraint and supervision mechanism construction within the industry, we can effectively improve the service quality and level of the entire industry. At the same time, close communication and coordination with the regulatory authorities is also an essential link, and the two sides should work together to promote the development of the intelligent investment advisory industry towards a more standardized and efficient direction.

6. Case Study

6.1. Regulatory and Risk Management Case Study

In recent years, the rapid rise of the Internet finance industry, the development momentum is strong, however, at the same time, it is also accompanied by a series of eye-catching risk events. Take the once-popular P2P online lending platform as an example, which once became a popular business form in the field of Internet finance. However, due to the lack of effective industry supervision measures and sound risk management mechanism, many platforms have appeared the capital chain tension or even fracture, the person in charge of the loss of contact and other serious problems, which undoubtedly caused incalculable economic losses to the majority of investors.

In order to solve this serious problem, the relevant regulatory authorities began to gradually strengthen the supervision measures on P2P online lending platforms. They have introduced a series of targeted policies and regulations that clearly require these platforms to establish a strict risk management system. These systems are designed to enhance in-depth assessment of borrowers' credit standing and implement more effective risk control strategies, thereby ensuring the safety of investors' funds. In addition, the regulatory authorities have also increased the daily operation supervision and regular inspection of the platform, and have taken an unrelenting attitude to crack down on any violations found.

After a period of continuous rectification and improvement, the P2P online lending industry began to gradually move toward standardized operation and healthy development. The risk management capabilities of major platforms have been significantly improved, and the legitimate rights and interests of investors have been more thoughtfully protected. This typical case profoundly reveals the crucial position of supervision and risk management in the Internet finance industry.

6.2. Implications and Significance of the Case

Through the in-depth analysis and reflection of the above cases, we can learn the following valuable lessons and Revelations. We must be soberly aware that strong supervision is a key factor to ensure the sustainable, steady and healthy development of the Internet finance industry. Therefore, the relevant regulatory authorities have the responsibility and obligation to further strengthen the overall supervision and management of the Internet finance industry. In order to achieve this goal, the regulatory authorities need to continuously improve and optimize the current policy and regulatory system to ensure that each clause can accurately guide the industry to a standardized and orderly development path. Secondly, risk management has undoubtedly become the core competitive element of the Internet finance industry. In this context, Internet financial institutions must attach great importance to the construction and improvement of risk management mechanisms. This means that institutions not only need to set up a special risk management department, but also need to establish a scientific and systematic risk identification and assessment system. Through this system, organizations can identify and respond to potential risks in a timely

manner, thereby ensuring the safety and stability of their business operations.

7. Conclusion

As a prominent player in the financial technology sphere, intelligent investment advisers have garnered significant attention due to their capability to deliver customized investment advice and asset management services to investors. Nevertheless, amidst their swift progress, there exist several concerns that demand attention, including inadequate regulatory frameworks and risk management challenges. To guarantee that intelligent investment advisers consistently and reliably generate value for investors, it is imperative to undertake robust measures that foster their standardized development. Strengthening supervision is a top priority. The regulatory authorities should pay close attention to the dynamics of the intelligent investment advisory market, formulate and implement strict regulatory policies to ensure that its business operations meet the requirements of laws and regulations.

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