

Redefining Fiduciary Duty in the Era of Robo-Advisors

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Abstract

Robo-advisors represent the convergence of artificial intelligence and financial services. Their primary function revolves around asset management, with investment advisory services playing a secondary role. While robo-advisors do not alter the fundamental principal-agent relationship between investors and advisory firms, they strengthen fiduciary responsibilities due to the enhanced operational rights over investors' accounts. Artificial intelligence currently still needs to gain independent legal personality, serving as a tool rather than an agent. The subjects of fiduciary duties should be the operators and developers of robo-advisors. The context of fiduciary duties for robo-advisors has been updated and upgraded due to the incorporation of algorithms. The duty of loyalty primarily focuses on preventing conflicts of interest, with legal norms mandating the disclosure of basic operational logic information, commission sources, the degree of human intervention, and changes that significantly affect investors' interests. The duty of care requires service providers to conduct comprehensive due diligence, operate algorithms prudently, pay close attention to fund security, and use data cautiously to achieve the best execution of investors' entrusted affairs.

Keywords

Robo-Advisors, Fiduciary Duty, Loyal Duty, Diligence Duty

1. Introduction

The emergence of robo-advisors, intelligent investment advisors powered by artificial intelligence, big data analytics, and cloud computing, has transformed the investment landscape. These innovations have attracted investors due to their efficiency, cost-effectiveness, and personalized services. Robo-advisors simplify complex investment processes and enhance decision-making through tailored asset

allocation strategies, improving investor satisfaction and accessibility. This development marks a new era in investment advisory services, characterized by automation and convenience.

The concept of fiduciary duty needs to be redefined in the age of robo-advisors, as these automated investment tools have transformed the role of traditional investment advisors. Robo-advisors now offer not only advisory services but also asset management capabilities. Investors trust robo-advisory firms with their accounts and assets, and the responsibility for investment outcomes ultimately lies with the investors themselves. This model requires a significantly higher level of trust compared to traditional advisory models. Robo-advisors have changed financial behavior by creating a hybrid approach that combines human design with algorithmic decisions. This collaborative process, which involves both humans and artificial intelligence, expands the subject of fiduciary duty from just the robo-advisors to include their developers as well. The requirements for fiduciary duty have also become more stringent, especially regarding the disclosure of algorithmic information and the exercise of prudence in algorithm operations.

This paper examines the fiduciary duty of robo-advisors to update the subjects and context associated with fiduciary duty. The goal is to encourage developers and operators of robo-advisors to fulfill their duties comprehensively and appropriately, diligently uphold their responsibilities, strive for excellence, alleviate investors' concerns, accelerate the adoption and growth of robo-advisors, continuously enhance service standards, and ultimately promote the advancement of intelligent finance and the broader artificial intelligence industry.

2. The Analysis of Robo-Advisors

2.1. The Workings of Robo-Advisors

The specific processes and operational methods of robo-advisors vary in practice, demonstrating diversity. Despite differences in details and service models, the primary service process consists of four steps: 1) Customer Profiling: The system evaluates clients' risk tolerance and investment goals through questionnaires. 2) Portfolio Allocation: Based on users' risk preferences, the system recommends personalized investment portfolios from a pool of assets. 3) Trading Execution: The system issues trading instructions and executes transactions on behalf of clients. 4) Portfolio Rebalancing: Users periodically review their asset portfolios while the platform monitors and adjusts positions based on market conditions and changes in user needs (Li, 2016). Based on this, robo-advisor services are often operationally integrated with asset management, leading to a practical situation where asset management and investment advisory services are combined, weakening the standalone value of investment advisory services. Conducting asset management business through intelligent technology has become the core. Unlike traditional investment advisors, which solely offer investment advisory services, the typical robo-advisor service model features asset management as its primary function, with investment advisory services as an ancillary function.

2.2. The Dual Edges of Robo-Advisors: Benefits and Risks

The service model of robo-advisors presents both advantages and concerns. Its advantages lie in convenience and efficiency, reduced transaction costs, evolving from the traditional offline one-on-one investment advisory service model to a platform that can simultaneously serve thousands of investors, with investors able to modify and enjoy services anytime, anywhere, algorithmic representation of investment advisors' professional knowledge and experience, and standardization of service systems, leading to lower service fee thresholds, broader client bases, and gradual outreach to small and medium-sized investors, which facilitates the creation of a new inclusive finance development model and unleashes the potential of the long tail market; compared to humans, machines, and specifically artificial intelligence compared to traditional investment advisors, offer relatively neutral and objective services, free from subjective factors like emotions, thereby reducing behavioural biases.

Like a coin with two sides, the development of robo-advisor services is accompanied by issues: Firstly, the alienation of robo-advisor services. The robo-advisor initially aimed to assist small and medium-sized investors with low thresholds and fees, acting as a buyer investment advisor. However, upon entering the Chinese market, it shifted to a seller investment advisor model, focusing on recommending fund company products to earn sales commissions rather than charging advisory fees. This change favors fund companies over investors, turning the system into a mechanism for pushing fund products. This shift is often masked by intricate algorithms and convoluted contracts, making it challenging for investors to recognize the impact on their interests (Zhong, 2020). Secondly, conflicts of interest and algorithmic risks lurk behind artificial intelligence. Unlike traditional investment advisory models, the interest preferences and biases of robo-advisors are concealed behind artificial intelligence, posing challenges for investors in understanding and overseeing them. The "neutrality" of artificial intelligence is not absolute, especially in asset management services where full-service, one-stop account custody resembles a separation of ownership, management rights, and control rights. In theory, human-machine transactions and interactions do not involve conflicts of interest and reduce agency costs. However, in reality, algorithms are personal opinions wrapped in mathematical language, and investment advice or asset management may be influenced by service providers' personal preferences or profit motives. Under traditional investment advisory services, even if improper interests drive some human advisors' recommendations, the impact is still limited in scope. However, robo-advisors incorporate interest preferences into complicated algorithms, which are widely applied to all serviced accounts. Similarly, the "intelligence" of artificial intelligence is not absolute; it is essentially a tool for service providers. Unreasonable algorithm design or incorrect programming can lead to deviations beyond reasonable limits, causing property losses, product homogenization, and herd effects (Wu & Ye, 2018). Thirdly, legal relationships and responsible entities hide behind the veil of technology, leading to

external regulatory failures. The essence and risks of robo-advisor services supported by technology are difficult to qualify. Internal algorithms are complex, making it hard to explain specific factors affecting them and identify responsible entities. The boundaries of financial institutions are blurred, with extensive connections between financial and technology institutions, leading to layered nesting and infinite intermediaries. Artificial intelligence itself cannot become a qualified civil subject, and some platforms, considered technology institutions, do not bear investor suitability obligations, thereby bypassing existing laws such as securities regulations. Fourthly, investors and robo-advisor institutions have vastly unequal advantages. With the development of financial technology, the gap between service institutions and investors, who already have advantages in terms of professional knowledge, information access channels, and skill levels, has widened further, placing investors in an increasingly passive position. In traditional investment advisory services, when investors inquire about investment advice from human advisors, they can request explanations in simple and easy-to-understand terms, thereby bridging the gap in information acquisition and understanding. However, investment advice in robo-advisory services is entirely generated by algorithms. More than simply disclosing the algorithm is needed to explain its operational process and principles effectively. Investors need help understanding the rationale behind the investment advice and need help to obtain further information, leading them to be more inclined to accept the investment recommendations provided by robo-advisors passively.

Influenced by factors such as the alienation of robo-advisor service functions, the concealment of conflicts of interest, the complexity of algorithms, vaguely responsible entities, chaotic legal relationships, and the vast disparity in advantages between institutions and investors, appropriate legal intervention becomes even more necessary. By adjusting and coordinating the interests of robo-advisor service institutions and investors, an appropriate balance between promoting innovation and protecting investor interests can be sought, achieving effective market operation.

3. The Rational of Fiduciary Duty

The robo-advisory service has not fundamentally altered the legal relationship between investors and robo-advisors; rather, it is a service upgrade cloaked in technological veneer, achieved through the application of weak artificial intelligence. The fundamental legal relationship between the two remains one of principal-agent, where the principal (investors) authorizes the agent (robo-advisors) to operate and manage their account, with the legal consequences of the agency actions borne by the principal (investors). This principal-agent relationship forms the basis of their fiduciary relationship. It is worth mentioning that the recognition of a fiduciary relationship does not hinge on whether the actor possesses the franchise qualifications required by laws and regulations but rather on a substantive assessment of the legal relationship between the two parties. In other words, the judgment

of the fiduciary relationship between robo-advisor services and investors is not predicated on fulfilling compliance qualifications such as obtaining relevant licenses by the robo-advisor institutions.

The ancient saying, “Accepting someone’s entrustment, one must faithfully fulfil their duties,” aligns well with the “fiduciary duty.” From a legal standpoint, a fiduciary relationship exists between investors and robo-advisor services. On the one hand, robo-advisor services primarily provide socially needed and highly specialized asset management and securities advisory services. To effectively fulfil these services, robo-advisors are granted the right to operate and manage investors’ accounts based on a high level of trust from investors. High trust or reliance is the core of generating a fiduciary relationship, and the criterion for judging high trust lies in “personalization.” Compared to traditional investment advisory service models, robo-advisors offer more diverse personalized services and closer trust relationships with investors, as they provide personalized advice based on investors’ personal information and trade on their behalf, with subsequent real-time monitoring and portfolio adjustments. This upgraded trust enables robo-advisors to upgrade their operational and management rights over investors’ accounts. Conversely, it is also due to robo-advisors’ high control over investors’ accounts that investors place a high level of trust in them. On the other hand, given the potential for robo-advisor services to abuse entrusted rights, and with conflicts of interest and algorithm risks lurking behind artificial intelligence, while investors trust robo-advisor services, this entrustment poses risks. Investors themselves need help to avoid these risks. Once they entrust their accounts’ operational and management rights to robo-advisors, they must bear the legal consequences of the robo-advisors’ actions related to their accounts, leaving them with very limited ability to monitor and safeguard their interests. Meanwhile, the market’s regulatory function needs to be improved, and the cost for robo-advisory institutions to establish trust with investors may exceed their benefits (Tamer, 2012). At this point, appropriate legal intervention is urgently needed. From the principle of “honesty and keeping promises” in China’s Civil Code to the explicit requirements of the Securities Law for securities service institutions to “be diligent and fulfil their duties” to the specific obligations stipulated in the Interim Provisions on Securities Investment Advisory Business for securities companies, investment advisory institutions, and their personnel to be “honest, diligent, prudent, and loyal,” it is evident that China has established the concept of fiduciary duties for investment advisory service institutions. The embodiment of the specific content of fiduciary duties in China’s statutory law is no longer merely a moral obligation but also a legal obligation with legal enforcement and specificity.

Furthermore, the financial market is rapidly changing, and securities are special commodities that are complex and uncertain. Due to transaction costs and bounded rationality, it is difficult for investors and investment advisory institutions to conclude comprehensive contracts beforehand (Xu, 2021). Especially since robo-advisor services function through weak artificial intelligence centred on algorithms,

and artificial intelligence requires professionals to assist in its training and learning, its knowledge update speed is slower than that of professionals, and its emergency response capabilities need to be improved. Moreover, financial behavior requires opinions to be formed beforehand. All these factors mean that the contract between robo-advisor institutions and investors needs to be completed due to future uncertainties, the excessively high cost of anticipating all possibilities, and the contracting parties' rational limitations and speculative tendencies. While no contract is complete, the parties' rights and obligations can be roughly clarified based on most contractual relationships. However, due to the specificity of robo-advisor services, the uncertainty and probability of service institutions being driven by profits becoming speculative is greater after the contract is signed. Such incomplete contracts, containing gaps and loopholes, require legal intervention in the form of fiduciary duties to achieve supplementary and remedial functions.

4. The Subject of Fiduciary Duty

Artificial intelligence cannot bear the legal responsibilities of intelligent investment advisory services. Instead, intelligent investment advisory institutions should assume it, broadly understood as operators and developers.

Firstly, artificial intelligence does not bear legal liability and cannot qualify as a proper civil liability subject. Especially in intelligent investment advisory services, technology is in a state of weak artificial intelligence and essentially remains a service provider tool. It does have an independent operation and a certain degree of autonomy based on preset algorithms but lacks the independent will. Furthermore, artificial intelligence lacks physical attributes; for instance, copyright protects works, not ideas. Similarly, the protection and regulation of artificial intelligence should focus on its core—algorithms. Although some scholars argue that a unified registration platform can be established and reserve funds can be paid to prepare artificial intelligence to bear responsibilities, having reserve funds to cover responsibilities differs from being a qualified civil subject. Reserve funds are ultimately limited, which pre-defines the scope of responsibility for artificial intelligence in disguise, compromising fairness.

Moreover, having independent property to bear responsibilities merely satisfies the prerequisite for financial responsibility but cannot fulfil other non-financial responsibilities. For example, artificial intelligence cannot even complete civil liability for cessation of infringement independently and ultimately requires intervention from the underlying operator or developer. At the same time, legal responsibilities also have warning and moral denial functions, but artificial intelligence lacks shame and moral sense, making such functions impossible to achieve. Conversely, recognizing its subject status could easily be used as a “shield” by those seeking to avoid obligations, increasing moral risks.

Secondly, piercing through the veil of technology to directly hold the entities behind artificial intelligence accountable for their obligations has a certain legal

basis. Combining China's legal theories, intelligent investment advisors are similar to vending machines, serving as tools for businesses (operators) to provide services to consumers (investors). Their actions, consequences, and ultimate responsibilities fall on the businesses (operators). If there are errors or defects in the factory-installed products (algorithms), they may also be attributed to the producers (developers). However, intelligent investment advisors have a certain degree of autonomy, slightly differing from vending machines lacking independent capabilities. Their autonomous actions are similar to employee behaviour, with employers (operators) having supervisory and management obligations. Intelligent investment advisors can only engage in employment activities (services required by algorithms for investors). Since they lack legal subject personality, there is no need to assess intent or gross negligence, and the operator directly bears vicarious liability. Of course, some scholars using the concept of electronic agents can also explain why the legal effects of intelligent investment advisor actions fall on the principal (Samir & Laurence, 2011). Although this has less impact on the framework of existing legal rules, it implicitly affirms the legal subject status of artificial intelligence. It fails to explain subsequent issues, such as the recovery of electronic agents, thus this viewpoint is not fully accepted.

Finally, identifying obligation subjects in the intelligent investment advisory model falls on operators and developers. The academic community generally agrees that operators are the subjects of civil responsibility obligations. Specifically, operators include abstract legal entities such as investment advisory companies, company directors, senior management, and relevant practitioners. Regarding developers, they include financial practitioners who provide trading models and technical practitioners who design programs based on commissions. Intelligent investment advisory services differ from traditional investment advisory services by forming trading opinions beforehand advancing financial behavior. Under such conditions, investors have a high degree of trust in their opinions, making it necessary to regulate developers. However, due to different responsibilities, the content of obligations will also vary. Fewer scholars in the academic community discuss developers or implicitly classify financial practitioners who provide trading models as operators. In fact, financial practitioners who provide trading models are essentially the same as traditional investment advisors and belong to the subject of obligations. Some scholars argue that "program developers are distinct from financial practitioners who provide trading and decision-making models during development. The former are merely auxiliaries of investment advisors and do not bear the obligations of investment advisors; the latter should be identified as investment advisors and bear corresponding obligations." (Gao, 2018). We propose that technical practitioners who design programs based on commissions are auxiliaries of investment advisors but do not believe they can be completely excluded from the scope of obligation subjects. At least, they should bear compliance obligations such as possessing corresponding technical qualifications and disclosing relevant algorithm information.

5. The Context of Fiduciary Duty

The fiduciary duty includes the duties of loyalty and diligence. The former is a negative duty, emphasizing that the fiduciary must avoid conflicts of interest; the latter is a positive duty, requiring that the fiduciary not misappropriate or damage the principal's property for which the principal has paid consideration. Fiduciary duty is altruistic, aiming for optimal execution and maximizing the principal's interests. Establishing fiduciary duty ensures that investment advisory service providers not only act with trustworthiness, diligence, and responsibility when serving investors but also act in the best interests of investors. Compared to traditional models, robo-advisors have enhanced operational and management rights over investors' accounts. The extent of fiduciary rights determines the stringency of fiduciary duties. Therefore, the specific content of fiduciary duties should be updated based on the traditional investment advisory duties and tailored to the realities of robo-advisor services.

5.1. Duty of Loyalty

The duty of loyalty primarily focuses on avoiding conflicts of interest through information disclosure, with an overall requirement for timely, full, and fair disclosure of clear, concise, and understandable information, aiming to maximize investors' interests (Huang, Wang, & Zhang, 2022).

The relevant parties must publicly disclose the following information in the form of legal requirements, which constitute mandatory disclosure. First, disclosing basic operational logic information, including but not limited to methods for accessing and rating investment products, classifying clients, selecting and publishing objective criteria for investment products without biased parameters, the scope and limitations of services and products, how underlying algorithms and automatic portfolio rebalancing mechanisms operate, and the purpose and methods of data collection, storage, and processing. Second, disclosing commission sources, such as any remuneration payable by clients or other parties like product issuers and any other monetary or non-monetary benefits already obtained or to be obtained by the platform operator. Products should not be recommended to clients solely to generate high commissions and remuneration. Third, disclosing the degree of human intervention, specifically the level of human involvement in providing investment advice and asset management services, especially the involvement of investment advisory institutions and their personnel or even related parties in transactions, with prohibitions on self-dealing and dual agency. Fourth, disclosing algorithm risks, mainly regarding limitations, risks, and how key information generates the services' components, such as requiring descriptions of any limitations of robotic advisors and algorithms, how portfolio rebalancing mechanisms operate, and related risks. Fifth, disclosing changes that significantly affect investors' interests, such as when investors' portfolios are significantly affected by changes to existing algorithms or when significant delays or failures are rectified, investors should be truthfully informed of the reasons and handling methods.

Especially during automatic portfolio rebalancing, investors should be informed of the related costs and risks of rebalancing. If investors opt out of automatic portfolio rebalancing, they should be informed of their choice's potential risks and consequences.

The information required to be disclosed under the duty of loyalty primarily concerns conflicts of interest (Gan & Zhou, 2012). As a result, mandatory disclosure requirements do not include real-time trading performance metrics, such as success rates. While disclosing success rates can help investors set their expectations regarding returns and risks before trading—thereby avoiding potential conflicts and large-scale incidents—and can also help limit false advertising by operators, this information does not pertain to conflicts of interest. Robo-advisory institutions may choose to disclose their real-time trading performance for promotional purposes voluntarily. However, it is important to highlight that although regulatory authorities do not mandate such voluntary disclosure, once a robo-advisory institution decides to disclose this information, it must ensure that it is true, accurate, and complete. This means there should be no false records, misleading statements, or significant omissions, and the voluntary disclosure must not conflict with mandatory disclosure.

5.2. Duty of Diligence

The duty of diligence, also known as the duty of care, specifically requires robo-advisory service providers to conduct comprehensive due diligence, operate algorithms prudently, pay high attention to fund security, and use data cautiously to achieve the best execution of investors' entrusted affairs.

- **Comprehensive Due Diligence.** The main objects of investigation include client information, product information, and risk control information. The questionnaire design must be sufficient, reasonable, and appropriate regarding client information. Quantitative and qualitative factors must be considered when analyzing investors' personal information. When clients provide inconsistent information, identify and reconcile specific inconsistencies, conduct internal reviews and follow-ups, or use system prompts or manual intervention to provide clients with opportunities to correct information.
- **Regarding product information,** there should be an appropriate and overall mechanism for assessing the suitability of investment products, distinguishing between products to avoid homogenization.
- **Regarding risk control information,** research and development should consider all risks arising from algorithm design, including credit risk, liquidity risk, counterparty risk, and leverage. Risk analysis methods and mechanisms, risk analysis of investment products, and risk analysis of individual clients should be regularly assessed (Liu & Jiang, 2021).
- **Prudent Algorithm Operation.** Data protection and network security must be ensured during operation. Algorithms should be monitored and tested to minimize the risk of fraud, errors and omissions, interruptions, or other operational

defects. Qualified professionals must perform algorithm modifications (Guo, 2019). Emergency response plans should be regularly reviewed and tested, including rehearsing how algorithms handle policies and procedures related to significant market events. Regular reviews should be combined with special reviews. Regular reviews should be comprehensive and cover all activities related to the design and operation of online platforms. Regular reviews should include sampling inspections and tests by qualified personnel and tracking policies and procedures to review results and improve performance. Special reviews can be conducted when appropriate.

- **High Attention to Fund Security.** Ensure that the fund custodian has the corresponding qualifications. Operate and manage funds according to investors' personalized plans, make prudent transfers, and conduct prudent transactions. The entrusted property and rights are prohibited from being used for purposes outside the pre-agreed scope. Additionally, separate management, accounting, tracking, and rebalancing should be implemented when managing multiple products for investors or providing services to multiple investors.
- **Cautious Use of Data.** Data should only be collected when directly related to its purpose. The collected data should be necessary and sufficient but not excessive. The data retention period should be, at most, the time required to fulfil the relevant purpose. The use of data should be limited to its original purpose. Direct marketing use must obtain the informed consent of the data subject. Data users should take all practicable steps to ensure data security. Data users should ensure that their policies and practices regarding personal data are open and that data subjects have the right to access and correct their data.

6. Conclusion

Fiduciary duties, as statutorily prescribed fundamental obligations, reflect the legal perspective on financial technology. The fiduciary duties of robo-advisors clarify the responsibilities within the legal relationship between investors and service providers, helping to balance their interests. When investors utilize these services, they implicitly assume fiduciary responsibilities. The legal framework establishes trust and protection mechanisms, bolstering investors' confidence in robo-advisory services. Essentially, the fiduciary duty system for robo-advisors is a set of specific rules formulated based on the general provisions of traditional investment advisory services. Therefore, maintaining the existing framework for investment advisory services is crucial for effective regulation of robo-advisors in China. Additionally, special regulations tailored to potential specific risks must be introduced, refining the subject and context of fiduciary duties. The ultimate goal of robo-advisors' fiduciary duties is to safeguard investors' interests while not stifling financial innovation.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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