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Fintech, Green Technology Innovation and Green Finance Development

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Abstract: With the increasing global focus on sustainable development, green finance plays an important role in promoting the green transformation of the economy, and the rapid development of fintech has provided new impetus for it. Based on the perspective of green technology innovation, this paper discusses the mechanism and impact of financial technology to empower the development of green finance. The study finds that financial technology can effectively alleviate the financing constraints of enterprises and improve the quality of environmental information disclosure through big data, artificial intelligence, blockchain and other technical means, so as to promote green technology innovation. At the same time, the application of financial technology has improved the efficiency and transparency of green finance, optimized the allocation of funds, and promoted the innovation of green financial products. This paper proposes to strengthen the standardization of green finance, improve the regulatory framework, and promote the sustainable application of fintech in the field of green finance to achieve broader social and environmental benefits.

Keywords: Financial Technology; Green Technology Innovation; Green Finance

1. Introduction

With the global emphasis on environmental protection and sustainable development, green finance has gradually become a hot topic in the financial field as a financial model that supports environmentally friendly economic activities. The rapid development of financial technology (FinTech) has provided new technical means and innovative ideas for green finance. Through big data, artificial intelligence, blockchain and other technologies, financial technology can effectively improve the efficiency and accuracy of financial services, while reducing information asymmetry and transaction costs. This paper aims to explore how fintech can promote green technology innovation by enabling green finance, thereby promoting sustainable economic development.

2. Literature Review

From the existing literature, it can be seen that the research on fintech and green finance is relatively comprehensive and detailed, but the impact of fintech on green finance is not much. Cen and He [1] found that fintech can promote the development of green finance in at least the following three aspects: first, fintech can reduce transaction costs and thus improve capital utilization efficiency, second, the development of fintech will make green finance more widely used, and third, fintech can reduce the information asymmetry of financial institutions and enhance the risk management of financial institutions. Vergara and Agudo [2] analyze the relationship between financial technology and sustainable development through case studies and literature review methods, and points out that the application of fintech in the field of green finance is expected to promote the development of financial business sustainability to a higher level. Sun Xuewei[3] found From the aspects of products, services, management, infrastructure, etc., this paper systematically discusses the specific ways of financial technology innovation to help the development of green finance, and then puts forward relevant suggestions for promoting green financial technology innovation. Fang Shuang [4] and other scholars conducted an empirical test on the relationship between financial technology and green finance development, and found that financial technology has a significant positive impact on the development of green finance in China, and further based on heterogeneity analysis, it is concluded that the impact of financial technology on green finance in the eastern region is more significant than that in the central and western regions.

Fintech is essentially the application of technological innovation in the financial field, which changes the way financial services are provided, improves the efficiency of financial services by introducing new technical methods, and also promotes the innovation and development of financial products. Hou Shiying and Song Liangrong [5] believe that firstly, fintech can improve the efficiency of financial resource allocation,

secondly, fintech can accurately predict the effect of R&D and investment, and finally, fintech can break the geographical dilemma of market innovation elements and reduce the dependence of innovation subjects on traditional research, production and marketing. Shen Huahua [6] concluded through empirical analysis that financial technology can reduce information asymmetry, alleviate financing constraints, promote technological innovation of enterprises, and improve the efficiency of green economy. Poincarand [7] empirically explores the impact of fintech on enterprise technological innovation based on listed financial data. The research finds that the development of financial technology can significantly promote the technological innovation of enterprises. Green finance is one of the paths for sustainable economic development. Therefore, exploring the impact of technological innovation on the development of green finance has become a hot topic for many scholars. Hou et al. [8] based on the functional view of technological innovation, believe that technological innovation significantly promotes regional green development through knowledge spillover effects, resource utilization effects, human capital effects and input-output effects. Ulucak [9] argues that world economic growth has exacerbated resource scarcity and environmental degradation, and countries have shifted their traditional economic growth focus to sustainable development, and concluded that green technology innovation and efficient use of renewable and non-renewable resources are of great significance for green development. Deng Jintang and Lu Li [10] based on the quasi-natural experimental results of the green finance reform pilot zone show that green technology innovation plays an intermediary role in the process of green finance policies to promote pollution and carbon reduction in the pilot zone, and the higher the level of green innovation in the city, the more green finance-related policies can promote regional pollution and carbon reduction. Therefore, China should take more measures to promote green technology innovation and the development of green finance. At present, there is a relative lack of literature on fintech and green finance, mainly focusing on the relationship between fintech and green finance, and there are even fewer literatures exploring the mechanism of action.

3. Theoretical Analysis

With the vigorous development of financial technology, cutting-edge digital technologies such as big data, blockchain, artificial intelligence, and cloud computing have been widely used in the field of green finance. These applications not only effectively solve various problems in the development of green finance, but also empower the development of green finance from multiple dimensions and depths. The impact mechanism of financial technology on the development of green finance can be summarized as follows:

Improve the level and efficiency of green financial services, shorten the review process, and reduce service costs. The essence of green finance is still finance, and fintech can improve the efficiency of financial services. Traditional financial services often require customers to go to the counter or physical stores, which not only increases the customer's time and transportation costs, but also cumbersome approval and verification processes, and consumes a lot of human resources. However, the application of fintech, such as blockchain and cloud computing, has simplified the financial services process, shortened approval times, and improved service efficiency, making green financial services available to customers who were previously not covered by traditional financial institutions.

It alleviates the information asymmetry in the field of green finance and significantly reduces the green identification cost of financial institutions.

With the deepening of low-carbon transformation, the green finance business of financial institutions continues to develop, and the application of financial technology has significantly reduced the cost of green identification of financial institutions. Through big data technology, financial institutions can quickly integrate information related to the corporate environment, grasp the green status of enterprises in an all-round way, quickly identify green projects, and reduce the risks caused by information asymmetry. At the same time, financial institutions can use blockchain technology to create environmental risk assessment tools, which can track and record the environmental performance and carbon footprint of enterprises, helping financial institutions accurately assess the environmental risks of enterprises, thereby reducing the cost of due diligence. The application of artificial intelligence technology has further improved information analysis and processing capabilities, helping financial institutions to more accurately identify green projects.

Increase the supply and innovation of green financial products to meet multi-level and diversified financing needs. With the transformation of China's economy to high-quality development and the strategic

goal of "dual carbon", China's green finance development level has made significant progress in recent years, and the system construction has been gradually improved. However, because China's green finance is still in its infancy, as a new field, the development of green finance still faces many problems such as insufficient product supply, single product types, and the urgent need to enhance innovation capabilities. Financial institutions can use financial technology to develop more types of green financial products, such as green bonds, green funds, green insurance, etc., to meet the needs of different market participants. Through its powerful data processing and analysis capabilities, such as big data analysis and cloud computing technology, fintech can effectively tap the potential of market demand and accurately identify the differentiated needs of enterprises and individuals for green financial products at different stages of development.

Promote green technology innovation, improve energy efficiency, and promote the development of green finance. Green technology innovation has injected new impetus into the development of green finance. On the one hand, green technology innovation can provide more green development opportunities for enterprises. In the face of the environmental burden and resource consumption problems under the traditional industrial model, green technology innovation leads enterprises to green production by improving production efficiency, reducing pollution emissions and optimizing energy use, which not only reduces environmental risks, but also promotes the green transformation of industrial structure, providing a solid industrial foundation for the deepening of green finance. On the other hand, green technology innovation is particularly significant in the energy field, which has significantly improved energy efficiency and optimized supply chain energy management strategies by accelerating the popularization of low-carbon and clean energy technologies, such as the widespread application of renewable energy and the innovation of circular economy models. This series of changes not only promotes the green transformation of the energy structure, but also provides rich materials and opportunities for the diversified design and innovation of green financial products, and promotes the vigorous development of the green financial market.

4. Conclusions and Policy Recommendations

Fintech can effectively empower the development of green finance by improving information symmetry, optimizing capital allocation, and promoting financial product innovation. The integration of fintech and green finance has a significant role in promoting green technology innovation. However, the integration of fintech and green finance still faces challenges such as technology compatibility and data security. Based on the above conclusions, this paper puts forward the following policy recommendations: strengthen the standardization of green finance: formulate unified green finance standards to ensure the standardization and effectiveness of fintech applications; Improve the regulatory framework: strengthen the supervision of the integration of fintech and green finance to prevent financial risks; Promote data sharing and security: Establish a data sharing platform, strengthen data security protection, and ensure the authenticity and confidentiality of enterprise environmental data; Encourage financial innovation: Support financial institutions to develop more green financial products and services to meet the demand for green technology innovation.

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