

The Mechanism of Green Finance to Prevent the Risks Brought by Climate Change to Economic Development.

Mengran Han *

Nottingham University Business School China, University of Nottingham Ningbo China, Ningbo, China

* Corresponding Author Email: biymh13@nottingham.edu.cn

Abstract. Nowadays, environmental issues have become one of the important factors affecting economic development. Green financing is crucial to the green and sustainable development that nations are becoming more and more focused on. Global warming has a negative impact on economic development, such as frequent extreme weather, sea level rise, etc., and these physical risks will eventually be converted into financial risks. Green finance can guide more resources to the green and low-carbon field, adjust carbon prices, and promote establishing a carbon emission trading market. At the same time, green finance directly links the physical risks in the environment with financial risks. This article summarizes relevant research on how green finance can prevent financial risks caused by climate change. It mainly analyzes the prevention of financial risks caused by green finance from three aspects. Green finance prevents relevant risks by promoting policy and market innovation, enhancing climate resilience, and promoting low-carbon transformation. It identifies the constraints of the existing research and development of green finance under the current circumstances by talking about the effect mechanism of green finance.

Keywords: Green finance; environmental change; economic development.

1. Introduction

1.1. Realistic Background

In recent years, with the rapid development of the global economy and the continuous growth of population, the problems of global climate change, environmental pollution, and resource shortage have become increasingly prominent, which has brought challenges to the sustainable development of the economies of various countries. The Paris Agreement offers guiding principles for the green development of economies worldwide in the face of adverse changes in the global climate [1]. In the current background, green finance is a crucial element in promoting the green transformation of the economy. It encompasses a range of financial instruments and products, including green credit, green bonds, green insurance, green funds, and others. Through creative financial services and products, it directs social capital toward environmentally friendly and energy-efficient products [2]. Nowadays, global warming has become a serious problem affecting economic development. For example, extreme weather will bring economic losses, sea level rise will cause loss of land and capital stock, and rising temperature will accelerate the depreciation of fixed assets, which will exacerbate financial risk. The rise of default rate and default loss rate will increase credit risk. The problems of financial institutions will increase operational risk, insurance compensation will increase insurance risk, and natural disasters may also affect confidence in local banks, thus increasing liquidity risk. Green finance promotes environmental protection and ecological governance while also optimizing, upgrading, and sustainable development of economic structures.

1.2. Academic Background

Green finance, as one of the most important parts of today's financial field, is increasingly becoming the focus of global economic development and academics, policymakers, and financial institutions have gradually begun to pay attention to it. At present, green finance research has yielded promising results in academia. From the theoretical level, the connotation, characteristics and mechanism of green finance have formed a relatively complete theoretical system. From a practical

point of view, governments, financial institutions, and enterprises of various countries have launched a range of green finance policies [3]. All of these provide strong support for the development of green finance. However, green finance also faces many challenges in the process of development, such as imperfect laws and regulations, low market awareness, and imperfect risk assessment and pricing mechanisms [4]. Therefore, based on previous research, this article will further explore the development path and strategy of green finance by studying the impact mechanism of green finance.

1.3. Research Significance

The research purpose of this article is mainly in two aspects. Focusing on these two purposes, this article will discuss from the following aspects: First, it introduces the basic concept and development status of green finance. Secondly, analyzes the impact mechanism of green finance from different angles. Then discusses the problems and challenges faced by green finance in the process of development, and finally puts forward strategies and suggestions to promote the healthy development of green finance by analyzing its role mechanism.

2. Green Finance Promotes Policies and Market Innovation

2.1. Background and Goals.

At present, environmental problems are severe. Environmental pollution, resource depletion, ecological imbalance and other environmental problems have become global economic and political problems, posing a serious challenge to human survival and social development. To mitigate problems with environment and adapt to climate change, the concept of green finance has emerged in sustainable development. It aims to promote environmental protection and rational use of resources through financial means to achieve better goals of sustainable economic and development of the society. While pursuing economic benefits, the traditional financial industry also faces the challenge of environmental risks. The proposal of green finance provides a new direction for the transformation and development of the financial industry, that is, to achieve a win-win situation between economic and environmental benefits by supporting green industries and projects.

2.2. Policy System Innovation

For the green financial systems of different countries, it is necessary to combine national standards with local standards around the connotation of green finance. Moreover, make good use of policy tools to guide, monetary policy should give better play to the dual functions of the total amount and structure of policy tools, constantly make the green financial standard system more reasonable and compliant, strengthen the carbon accounting and optimization of green financial evaluation methods by requiring financial institutions to disclose environmental information. All of these play an important role in the impact mechanism of green finance. For example, carbon information disclosure (CID) plays an important role in reducing carbon dioxide emissions. Some scientists have studied the impact of carbon information disclosure on the emission reduction of companies or industries. CID projects with consistent evaluation criteria are conducive to the implementation of carbon reduction [4]. The carbon performance of companies or industries can now be evaluated with consistent carbon information evaluation standards in many CID projects [5]. The market encourages and requires financial institutions to improve information disclosure and transparency so that investors can understand the risks and benefits of green projects and enhance market confidence. Green finance also promotes its development by formulating support policies. Some governments will provide loan subsidies to transformation enterprises that have achieved their transformation goals or progress, and provide interest discounts on green inclusive loans, etc [6]. These policies directly reduce the financing costs of enterprises and encourage the implementation of green projects.

2.3. Market Innovation

For the relevant markets of green finance, green financial products and services are also innovating constantly. Nowadays, there are many diversified green financial products: green loans, green bonds, green insurance, green funds, green stocks, and carbon financial markets, etc., which meet the financing needs of different green projects. In addition to green financial products, the service model has also been innovated. For example, the Bank of Communications of China has created a comprehensive green finance service plan with nine products centered on "credit, supply chain, inclusiveness, investment banking, leasing, investment, financial management, insurance, and carbon finance" around different stages of green projects and the financing needs of various customers [7]. The carbon financial system's construction can be improved by promoting market innovation. On the one hand, the coverage of the national carbon market has been expanded, more high-carbon emission industries have been included, and the market liquidity and pricing rationality have been improved. On the other hand, allowing financial institutions to participate in the national market will help build a multi-level carbon financial market, promote the construction of an international carbon trading platform, and promote the international flow of carbon assets.

2.4. Technological Innovation in Market and Policy

The integration of science and technology and green finance promotes the development of the economy and society in a green, low-carbon and sustainable direction. People should strengthen the combination of green finance and digital finance, use digital technology to solve the cost efficiency problem of green finance, to improve the efficiency and coverage of green financial services [8]. For example, the Construction Bank of China launched a green financial product "carbon digital loan" based on the "carbon footprint" to empower micro, small, and medium-sized enterprises with low-carbon transformation through digital technology [7].

3. Green Finance Enhances Climate Resilience

3.1. Main Ways for Green Finance to Enhance Climate Resilience

Firstly, by providing financial support for green projects, green finance promotes technological innovation and development in the fields of clean energy, green buildings, low-carbon transportation, etc. These projects and technologies help reduce greenhouse gas emissions and improve the ability to cope with climate change. For example, financial institutions can provide loans for renewable energy projects to support the research and development and application of low-carbon technologies, thus enhancing the climate resilience of society [9]. Secondly, green finance also promotes the transformation and upgrading of traditional high-energy-consuming and high-emission industries by guiding funds to low-carbon and environmental protection industries and promoting the development of the economy in the direction of green and low-carbon. This transformation will help reduce the economic system's dependence on fossil fuels and enhance the economy's adaptability to climate change. Thirdly, while promoting green projects, green finance also pays attention to the establishment and improvement of risk management systems, including climate risk assessment, monitoring and early warning systems. By accurately identifying various risks, financial institutions can improve their ability to predict, respond to, and dispose of green financial risks [10], and effectively prevent financial risks caused by climate change. The above three methods are the main ways for green finance to enhance climate resilience.

3.2. Credit Risk, Market Risk, Operation, and Compliance Risk

Green finance prevents credit risk by enhancing climate resilience. Green finance projects are usually closely related to environmental protection policies and sustainable development goals, which help to reduce the risk of default for borrowers. At the same time, through a strict project evaluation and screening mechanism, financial institutions ensure that funds are invested in projects that meet

green standards and are sustainable, further reducing credit risk. Green finance also prevents market risks by enhancing climate resilience. Green finance helps to promote the formation of a green and low-carbon financial market environment and reduces the risk of market price fluctuations caused by climate change. For example, with the gradual establishment and improvement of the carbon market, financial institutions can manage climate-related risks through market mechanisms such as carbon trading. Additionally, green finance projects involve complex environmental protection laws and regulations and technical standards, requiring financial institutions to have professional risk assessment and management capabilities. By strengthening internal training, improving operation processes, strengthening compliance management and other measures, financial institutions can reduce the probability of operation and compliance risks.

4. Green Finance Promotes Low-carbon Transformation

Green finance supports the development of green projects and industries such as clean energy, energy conservation, and emission reduction by providing financial services for environmental improvement, climate change and efficient use of resources [11]. By lowering carbon emissions and resource consumption, this not only supports the green transformation of the economic structure but also lessens the detrimental effects on the environment and lowers the financial risks associated with ecological harm and environmental pollution. Green finance promotes the green and low-carbon transformation of high-emission industries and the construction of renewable energy projects by guiding financial resources to green industries and projects and optimizes the allocation efficiency of financial resources. This helps to avoid excessive concentration of resources on high-energy-consuming, high-emission and low-level projects, and reduces financial risks caused by resource mismatch. The innovative financial products and services mentioned above will also play a role in low-carbon transformation. The continuous innovation of financial products and services, including green loans, green bonds, and others, can provide diversified financing channels for green projects through the use of green finance. This not only reduces the financing cost of enterprises but also supports green and low-carbon development through marketization, reducing excessive dependence on traditional high-carbon industries, to prevent financial risks.

5. Conclusion

This article mainly studies the impact mechanism of green finance from three aspects through a review of previous articles: promoting innovation, enhancing climate resilience and promoting low-carbon transformation. These three influencing approaches have effectively prevented financial risks and mitigated environmental pollution while promoting economic development, and have achieved important results.

To sum up, green finance has made efforts through policy innovation, market innovation, and the integration of science and technology and green finance. Green finance enhances climate resilience by supporting green projects and technological innovation, promoting economic transformation and industrial upgrading, and improving the risk management system, so as to prevent financial risks caused by climate change. These measures not only contribute to the sustainable development of both the economy and society, but also provide more stable and sustainable business growth points for financial institutions. However, by analyzing the process of preventing risks of green finance, it can be found that the current development of green finance also has some shortcomings, such as non-uniform standards, low information disclosure, and most of the main body of capital supply is banks. Therefore, people should continue to improve the standard system of green finance, comprehensively use a variety of policy tools, strengthen coordination and international cooperation among various departments, and promote better development of green finance. In the years ahead, with the continual advancement of the green financial system and the continual advancement of climate governance capabilities, green finance will have a greater impact on enhancing climate resilience and preventing

financial risks. Green finance has effectively promoted low-carbon transformation and prevented financial risks by supporting green projects and industries, optimizing the allocation of financial resources, strengthening environmental information disclosure and risk management, and innovating financial products and services.

References

- [1] Zhao X, Benkraiem R, Abedin M Z, Zhou S. The charm of green finance: can green finance reduce corporate carbon emissions? *Energy Economics*, 2024, 134.
- [2] Yuan J, Ali S, Nazar R, Ullah M I. Innovation for a greener future: Disentangling the asymmetric impact of green finance on green technology in European Union economies. *Heliyon*, 2024, 10(9).
- [3] Wang C, Qiu J, Chen B, Deng X. Green finance, green culture and corporate green management innovation: Evidence from Chinese listed companies. *Finance Research Letters*, 2024, 105774.
- [4] Bolton P, Kacperczyk M. Do investors care about carbon risk. *Journal of Financial Economics*, 2021, 142(2): 517-549.
- [5] Li R, Lu F, Xu J, Chen K, Zhao X. Effect of carbon information disclosure with consistent evaluation standards: An empirical study about carbon efficiency label in Huzhou China. *Energy Policy*, 2023, 181, 113717.
- [6] Shen M, Ma N, Chen Q. Has green finance policy promoted ecologically sustainable development under the constraints of government environmental attention? *Journal of Cleaner Production*, 2024, 450, 141854.
- [7] Chen C. Six state-owned banks show ESG report card: green credit exceeds 12 trillion. *World of Finance and Economics*, 2023, (7): 59-61.
- [8] Li X, Shao X, Chang T, Albu L L. Does digital finance promote the green innovation of China's listed companies. *Energy Economics*, 2022, 114, 106254.
- [9] Wang D, Bai Q. "Cooperation" or "competition": Digital finance enables green technology innovation—a new assessment from dynamic spatial spillover perspectives. *International Review of Economics & Finance*, 2024, 93, 587-601.
- [10] Hassan T, Khan Y, Safi A, Chaolin H, Wahab S, Daud A, Tufail M. Green financing strategy for low-carbon economy: The role of high-technology imports and institutional strengths in China. *Journal of Cleaner Production*, 2023, 415, 137859.
- [11] Wu C, Xu C, Zhao Q, Zhu J. Research on financing strategy under the integration of green supply chain and blockchain technology. *Computers & Industrial Engineering*, 2023, 184, 109598.