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The Impact of Green Finance on Regional Industrial Upgrading

Ziying Jiang[1,a,*]

[1]*Alliance Manchester Business School, The University of Manchester, Manchester, United Kingdom*
a. Ziying.jiang@student.manchester.ac.uk
**corresponding author*

Abstract: Against the background of intensifying global environmental problems, green finance is increasingly emerging. By introducing the capital flow to environment-friendly projects, green finance is gradually promoting the optimization of industrial chains and the formation of new industrial clusters, facilitating sustainable economic development. This study adopts a combination of theoretical discussion and practical analysis to explore the crucial role of green finance in industrial upgrading, supporting green technological innovation and achieving regional coordinated economic development. However, the study also found that the effects that green finance brought cannot always meet people's expectations and they are uneven due to differences in policy implementation and economic foundation in different regions. This study also highlights that the value of green finance as an important tool for sustainable development and suggests the need for further research on empirical evidence of green finance helping with industrial upgrading. Also, it is interpreted that the coordination of more efficient policy and resource integration is of vital importance in achieving balanced growth in the global economy.

Keywords: Green finance, industrial upgrading, regional economic development.

1. Introduction

In today's world, financialization and globalization have shaped economic development trends. However, the problems of global imbalance and the tension between the environment and economic growth have become increasingly prominent. As developing countries are pursuing rapid economic development, the sustainable use and exploitation of natural resources are usually overlooked so their environmental situations are getting more severe. For example, China's traditional energy structure which had been mainly based on the use of fossil energy for 20 centuries, is facing great challenges with the new development requirements of today's society [1]. Meanwhile, developed countries have been offshoring their production activities to those developing countries in the post-industrial era, which further exacerbated the global imbalances and environmental issues.

Despite the growing attention put on the environmental issue, especially from the developed countries, the environmental pressure faced by developing countries and the broader challenges of global sustainable development issues receive comparatively less focus [2]. This then leads to a more complex problem related to the industrial structure: regions dominated by traditional industries are more likely to suffer from environmental challenges, whereas regions with emerging industrial clusters tend to maintain better prospects for balancing economic development and environmental protection while keeping their developing speed.

With the need for a more sustainable model of growth, green is emerging as an important tool making a huge difference in facilitating sustainable development. It seeks to promote economic growth while simultaneously addressing environmental concerns. By encouraging investment in environmentally friendly projects, green finance not only fosters a shift towards greener production methods but also restricts those high-polluting enterprises, thus enhancing the sense of responsibility in the industry. This approach is making differences through a dual route that promotes a positive impact on the environment and discourages harmful practices, so it is helping alleviate the contradiction between economic development and environmental issues. This paper will mainly focus on the relationship between green finance, industry structure and regional economic development. with the discussion of the empirical evidence from recent studies, the purpose of this paper is to study how green finance could promote industrial upgrading and regional coordinated development, if it has delivered what people expect to see, and to identify the limitations in the implementation process.

2. Concept Elaboration and Theoretical Exploration

The rise of green finance mainly resulted from the growing environmental problems [3]. In the late 20th century, the issues of climate change, environmental pollution and resource depletion caused by human activities have become increasingly serious. In response to these challenges, there has been an exploration of methods to introduce financial resources into the areas that contribute to environmental protection and sustainable development. Meanwhile, many international agreements, such as the Kyoto Protocol and the Paris Agreement , have also contributed to the development of green finance [4,5]. A series of requirements from these agreements, including reducing greenhouse gas emissions and increasing the use of renewable energy, have encouraged governments to establish policies or mechanisms to support eco-friendly activities. Furthermore, with the growing environmental awareness, investors' preferences on investment choices have gradually changed. The emphasis on ESG factors is also making financial institutions focus more on green investment and developing a series of green financial products to meet market demand. The progress in science and technology has also helped environment-friendly projects deliver a more visible difference therefore making green finance more appreciated.

According to Lindenberg the definition of green finance is interpreted differently in various research [6]. Lindenberg indicated that green refers to linking financial activities to environmental factors and promoting a range of economic activities that contribute to the restoration and protection of the environment. For example, the financing of projects that are directly related to environmental governance and the relevant public policies, including the various specialized green financial products, can be regarded as part of green finance [6]. In addition, the legal and institutional framework that underpins these operations in the financial and economic system is also considered part of green finance. People are trying to utilize these green finance products and policies, to facilitate the resources flows into environment-friendly projects for institutions or individuals so that the goal of sustainable development could be achieved [7].

Industrial structure refers to the proportion and interrelationship of different industries within a certain region. Industrial upgrading, on the other hand, refers to the gradual development of industries through technological progress, innovation, and the extension of industrial chains. A rational industrial structure and effective industrial upgrading could have a prominent impact on regional economic development. For instance, environment-friendly and technology-based industries can usually provide more secure and long-term employment opportunities and economic growth potential, thereby thriving the economic level of the region. The impact of green finance on the industrial structure is mainly through the government or financial institutions to intervene in the capital flows,

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guiding the high-polluting or overcapacity industries to transform into low-emission and eco-friendly industries so that upgrading of industrial structure could be reached [1].

3. The Influence Mechanism of Green Finance Policy on Regional Industrial Structure Upgrading

3.1. Green Finance Policies Guide Funds to Green Industries

A crucial role of green finance is that it enables capital flows into sustainable economic activities and investments, thereby prompting the green development of various industries [3]. The underlying logic is to optimize the allocation of resources by utilizing financial and policy tools. For example, the Sustainable Finance Guidelines issued by the EU provided framework support at the institutional level, combining the financial flows with investors' carbon reduction preference so that more green projects could receive enough financial support [3]. This kind of guidance is reflected in a range of different aspects. The EU, for instance, has attracted many investors into the green economy with the issuance of green bonds, the application of a green credit system and the provision of green loans [7]. In addition, green finance could also be delivered through a positive government fiscal policy. In China, the government actively promotes activities and technological innovations related to environmental protection with large-scale financial subsidies [8]. The synergistic operation of these different tools not only enhances the financing of green projects but also accelerates the transition of the global economy towards sustainable development.

3.2. Green Finance Policies Promote the Transformation of Traditional Industries

Noted by Xu and Dong, the contribution of green finance to the optimization of industrial structure is intuitively clear, with a strong positive correlation [9]. The most obvious impact it brought is that enterprises that are unable to break through the limitation of their negative environmental impacts will be gradually eliminated due to the loss of financial capital and the comprehensiveness of the government's environmental policies and emission requirements. Meanwhile, green finance has facilitated technological innovation to a certain extent. This is reflected in China, where renewable energy technology innovation has made great progress with the support of green finance, which also drives the optimization of China's industrial structure [1]. According to Wang and Wang, it can be found that the amount of capital used in green finance in China gave the most obvious correlation with the output value of the tertiary industry compared to the primary and secondary industries [10]. Technically, structural upgrading is usually discussed in the context that the dominant position of the primary and secondary industries is gradually weakening and the growth of emerging industries. And it is widely acknowledged that emerging industries also tend to be more associated with high-technology and high-value-added activities. Therefore, the positive effect of green finance in accelerating industrial upgrading should not be neglected.

3.3. Green Finance Policy to Promote Industrial Chain, Regional Coordinated Development

Based on promoting industrial upgrading, green finance further plays an important role by promoting the optimization of the industrial chain and the coordinated development of the regional economy [11]. It is also mentioned that, with the aggregation and application of environment-friendly technology innovation, the industrial structure could be transitioned from labour-inventive to capital-intensive and technology-intensive [11]. Thus, the penetration of sustainable development in both upstream and downstream of the industrial chain could be further achieved [9]. In addition, green finance would also contribute to the coordinated development of regional economic development with the formation of green industry clusters. With the sharing infrastructure and local policy

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incentives, these clusters could not only reduce their operating costs but also promote technological innovation through knowledge sharing and industry specialization. In this way, regional economic disparities could be gradually narrowed, and a more balanced interregional development could be achieved.

4. Evaluation of the Effect of Green Finance Policy on the Upgrading of Regional Industrial Structure

In terms of outcomes that green finance brought, it did deliver the results that people expect to some extent. In China, green finance has promoted the development of tertiary industry. More specifically, the development and application of renewable energy have made great progress in the tourism industry [12]. Moreover, green finance has led to a reduction in CO2 emissions from industrial production in India [13]. Although it's temporarily impossible to achieve zero-emission, green finance has allowed India to carry out further development at a lower cost of environmental degradation.

However, the results demonstrated by green finance are also limited. For example, due to the large geographical span in China, the development departure point, geographic environment and policy implementation among different regions are differentiated as well. This has led to an imbalance in the development of green finance itself among different regions in China. In detail, its application gradually waned from the east to the west of China [11]. And thus the positive effects that green finance delivers are also unevenly distributed across different regions. Furthermore, with the findings among the ASEAN countries (Indonesia, Malaysia, and Singapore), it's demonstrated that although the issuance of green finance products, especially green bonds, has been improved and optimized, this did not effectively facilitate the development of renewable energy within Southeast Asia [14]. A proportion of the proceeds from green finance were used to repay debt or refinanced in green projects from other countries instead of domestically [14]. With the information above, it can be found that the limitation of green finance in mitigating regional or international imbalances in development, despite its effectiveness in industrial upgrading.

5. Conclusion

This paper discussed the impact of green finance on industrial upgrading from both technical and practical perspectives with the revision of recent research about green finance. As global environmental problems become increasingly severe, green finance, as an important tool for promoting sustainable development, has not only positively influenced the transformation and upgrading of the industrial structure by attracting capital flows into green projects and encouraging environmental-friendly investments but has also helped with the coordinated development of regional economies. In supporting the formation of emerging industry clusters and optimizing both the upstream and downstream of the industrial chain, green finance demonstrates its value in building a sustainable economic ecosystem.

There is a large scale of reflection and advice in the existing literature to improve the effectiveness of green finance. For instance, Azhgaliyeva et al suggest that, to make sure the funds and proceeds from green finance are truly utilized in green projects, governments or financial institutions should set criteria for eligibility to ensure the effective allocation of capital. Additionally, with the robust growth of financialization globally, it is noted by Fu et al that other types of finance, such as blue finance, digital finance, and social finance, should also be included and utilized together with green finance to gain a more comprehensive sustainable development. Also, it is worth noting that there are relatively few empirical studies in the existing literature on the specific outcomes that green finance brought on industrial upgrading. Most studies focus on China, and there is a paucity of relevant

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empirical studies in other countries, especially developed countries. Therefore, an in-depth exploration of this area awaits further research by scholars to better understand the diverse impacts and potential of green finance on industrial upgrading on a global scale.

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