

Research on the Empowerment of Green Finance Development by Digital Economy Based on the Guidance of Common Prosperity

Lili Wang^{a,*}, Dongmei Wang^b

School of Business, Taishan University, Tai'an, Shandong, China

^a wll_0123@sina.com, ^b wdmzlj@163.com

**Corresponding author*

Abstract: *With the rise of the digital economy and green finance, achieving common prosperity in both fields has become an important research direction. This paper aims to explore how a common prosperity-oriented digital economy can empower the development of green finance, thereby achieving a win-win situation for economic development and environmental protection. By analyzing the concepts of the digital economy and green finance, this paper examines their intrinsic connections and interaction mechanisms, and proposes corresponding policy recommendations and practical paths to promote sustainable development and the realization of common prosperity.*

Keywords: *Digital economy, green finance, collaborative innovation, sustainable development*

1. Introduction

With the rapid development of the global economy and the increasingly prominent environmental issues, green finance has received much attention as an important means of sustainable development. At the same time, the rapid development of the digital economy has provided new opportunities and challenges for the innovation and development of green finance. This chapter will introduce the background and significance of the research, and clarify the research objectives and methods.

2. Analysis of the Concepts of the Digital Economy and Green Finance

The digital economy is closely related to green finance. Through the application of digital technology, green finance can improve efficiency and transparency, launch innovative products and services, and promote inclusive development. The government plays a crucial role in the integration of the two, requiring the establishment of regulations, policy support, and incentive measures to guide regulatory development. The collaborative innovation of the digital economy and green finance will drive sustainable development and the achievement of shared prosperity.

2.1. Analysis of the Concept of the Digital Economy

2.1.1. Definition and Core Features of the Digital Economy:

The digital economy refers to an economic form that promotes the development and transformation of economic activities through digital technology as its foundation, utilizing digitization, networking, and intelligent means. In the digital economy, digitization is a key element, enabling information to be stored, transmitted, and processed in digital form through the application of digital technology, thus facilitating the global flow and sharing of information. In addition, the digital economy emphasizes networking, as the popularization and development of the Internet have established extensive connections and interactions between people, people and things, and things themselves. The characteristics of networking promote the expansion of economic activities and the optimization of resource allocation. Lastly, the digital economy emphasizes intelligence, including the development of technologies such as artificial intelligence, big data analysis, and the Internet of Things, which enable economic activities to possess higher levels of intelligence and automation, providing personalized products and services, and facilitating intelligent interaction and collaboration between individuals and society.

2.1.2. Impact of Digital Technology on the Economy and Society

The development of digital technology has had profound effects on the economy and society. Firstly, the application of digital technology has enhanced productivity. Through automation and intelligent techniques, production processes have become more efficient and precise, reducing costs and increasing output. Additionally, digital technology has provided businesses with more opportunities for innovation. Through data analysis and prediction, new business models and market opportunities can be discovered, driving the transformation and innovation of economic activities. The application of digital technology has also changed the ways and structures of economic activities. Traditional industries are transitioning towards digitization and the internet, while emerging industries such as e-commerce, the sharing economy, and online education are rapidly rising. The development of digital technology has also facilitated the integration and collaboration between industries, breaking the boundaries of traditional sectors and forming new industrial ecosystems. This transformation and integration bring about new business opportunities and economic growth. The development of digital technology has had a wide-ranging and profound impact on the economy and society. It has propelled improvements in productivity, changes in economic activity patterns, and transformations in industrial structures. Digital technology has created more opportunities and challenges for individuals and businesses, and has also brought new impetus to economic development[1].

2.2. Analysis of the Concept of Green Finance

Green finance refers to the use of financial instruments and mechanisms in financial activities to promote environmentally friendly and sustainable economic activities, with environmental protection and sustainable development as core objectives. Its main goal is to drive sustainable development in the financial sector while reducing adverse impacts on the environment. With the increasing prominence of global environmental issues such as climate change, biodiversity loss, and resource overexploitation, the concept of green finance has emerged. It emphasizes that financial institutions and markets should consider environmental and social factors in resource allocation and investment decisions to achieve a balance between economic growth and environmental sustainability.

The core objective of green finance is to guide funds towards environmentally friendly and sustainable projects and industries, promoting the development of a low-carbon economy and clean energy while reducing excessive consumption of natural resources and environmental pollution. Green finance utilizes financial instruments such as green bonds, green loans, and green investment funds to provide financial support and market recognition for environmental protection and sustainable development projects. It also guides investors to allocate funds to enterprises and projects that possess environmentally friendly characteristics. The rise of green finance reflects the financial sector's recognition of and response to environmental issues. By introducing the concept and practices of green finance, financial institutions and investors incorporate environmental risks into the investment decision-making process, encouraging businesses to adopt environmentally friendly practices and promoting a path of low-carbon and sustainable development. At the same time, green finance provides investors with choices, enabling them to invest in projects and enterprises that possess environmental and social value, achieving a win-win situation in terms of both economic and environmental benefits. The concept of green finance emphasizes the goals of environmental protection and sustainable development in financial activities. By guiding funds towards environmentally friendly and sustainable projects and industries, green finance can promote the development of a low-carbon economy and clean energy while reducing adverse impacts on the environment. The importance of environmental protection and sustainable development is emphasized in the concept of green finance, providing the financial sector with new avenues to address environmental issues and promoting the sustainable development of the economy and the environment[2].

3. Mechanisms of Empowering Green Finance Development in the Digital Economy

3.1. Role of Technological Innovation

Technological innovation plays a crucial role in driving the development of green finance. It enables innovation in green financial products and services, and enhances the efficiency and sustainability of green finance. Digital technologies have significant advantages in the field of green finance, as they can help financial institutions assess and monitor environmental and social risks more accurately, providing a more precise basis for green finance decision-making. The application of

technologies such as blockchain and smart contracts can achieve decentralization and transparency in green finance transactions, improving transaction security and credibility. Digitized processes and systems can enhance the operational efficiency and flexibility of green finance institutions. Additionally, digital technologies can facilitate the sharing and exchange of green finance information, promoting the healthy development of the green finance market.

While technological innovation holds great potential for green finance, it also faces challenges. Issues such as data privacy and security, technological standards, and regulation need to be appropriately addressed. Therefore, alongside driving technological innovation, it is necessary to establish corresponding regulatory frameworks and policy support to ensure the mutual promotion and coordination between technological innovation and the development of green finance. Only with reasonable regulation and policy guidance can technological innovation realize its maximum benefits and make significant contributions to achieving sustainable development goals[3].

3.2. Impact of Data-Driven Approaches and Information Sharing

Technological innovation plays an important role in green finance. Data-driven approaches and information sharing can provide accurate and comprehensive information foundations, aiding financial institutions in making more accurate decisions and more effective risk management. Data-driven approaches can utilize environmental and social data to assess sustainability performance and reduce biases from subjective judgments. Data analysis and modeling can help financial institutions identify and quantify green finance-related risks and develop corresponding risk mitigation strategies. Information sharing facilitates market transparency and cooperation, enhancing collaboration and synergy among financial institutions.

However, the quality, reliability, and security of data and information are critical issues. Financial institutions need to ensure the credibility of data sources and collection methods, and rigorously verify and review the data. Data security is also a crucial consideration, and financial institutions should implement appropriate security measures to protect data from unauthorized access and misuse. Furthermore, establishing sound data management and information sharing mechanisms is necessary to ensure the effectiveness and sustainability of data-driven approaches and information sharing. Technological innovation plays a significant role in empowering green finance. Data-driven approaches and information sharing can provide accurate and comprehensive information foundations, aiding financial institutions in making more accurate decisions and more effective risk management. However, ensuring the quality, reliability, and security of data and information is crucial. It requires collaborative efforts from financial institutions and relevant stakeholders to establish sound data management and information sharing mechanisms, strengthen data quality control, and enhance security protection to ensure the effective application of technological innovation in green finance.

4. Empowering Green Finance through a Shared Prosperity-Oriented Digital Economy: Policy Recommendations

4.1. The Role of Government Guidance and Regulation

The government plays a crucial role in the development of the digital economy and green finance, requiring guidance and regulatory measures to promote sustainable development and protect market stability. The government can guide and promote the development of green finance by formulating relevant policies and regulations. Incentives such as tax breaks and fiscal subsidies can be established to encourage financial institutions and businesses to participate in green finance activities. The government can also establish regulations and standards for environmental protection and sustainable development, requiring financial institutions and businesses to disclose environmental and social data to enhance the transparency and credibility of green finance. Government guidance and regulatory measures are essential for the sustainable development of green finance and market stability.

A real-life example is the European Union's Green Finance Initiative. The EU is committed to promoting sustainable development and addressing climate change, thus launching a series of green finance initiatives and policies. This includes the EU's Green Finance Taxonomy, aimed at providing investors with a unified green standard and classification system. This taxonomy helps investors identify and assess the sustainability of green finance products and encourages funds to flow into low-carbon and environmentally friendly sectors. The EU also requires financial institutions to disclose environment-related information, enhancing market transparency. Through these policies and standards,

the EU government has guided the development of green finance and provided investors with more reliable and sustainable investment options[4].

Another example is China's Green Finance Pilot Zones. The Chinese government actively promotes the development of green finance and considers it a strategic priority. To accelerate innovation and development in green finance, China has established Green Finance Pilot Zones, providing a range of policy and resource support. The pilot zones encourage financial institutions to offer green credit, green bonds, and other green finance products. They have also established a set of green finance indicators and evaluation systems to assess the environmental and social performance of green finance products. These measures have helped drive the development of China's green finance market and provided more green finance options for businesses and investors.

The government plays a crucial role in guiding and regulating the development of the digital economy and green finance. By formulating policies, setting standards, and enforcing regulations, the government can promote the development of green finance while maintaining market stability and sustainability. However, the government also needs to balance the interests and demands of various stakeholders, ensuring the rationality and feasibility of policies. When formulating policies and standards, the government needs to solicit opinions and suggestions from a wide range of stakeholders to ensure the scientific and operational nature of the policies. Additionally, the government needs to enhance cooperation and coordination in regulatory enforcement, working together with financial institutions and regulatory bodies to maintain market fairness and transparency. Through government guidance and regulation, the digital economy and green finance can contribute better to sustainable development and environmental protection.

4.2. Promoting Collaborative Innovation

The collaborative innovation mechanism between the digital economy and green finance serves as a vital pathway for promoting sustainable development and economic growth. To achieve this, effective policy measures are needed to facilitate cooperation and exchange between the two sectors.

One approach is for the government to encourage collaboration between the digital economy and green finance through policy formulation. This can involve establishing special funds to support innovative projects that integrate digital technology into green finance or promote the digital economy within the green finance sector. The government can also provide incentives, such as tax breaks and financial support, to encourage collaboration and innovation among enterprises in both sectors. For instance, implementing green finance innovation incentive programs can motivate digital economy companies to develop and apply green finance technologies and products.

Facilitating communication and collaboration between the digital economy and green finance is another crucial step. The government can organize thematic seminars, forums, and exhibitions to create platforms for enterprises in both sectors to interact and collaborate. Additionally, specialized institutions or organizations can be established to promote collaboration and exchange, offering professional consultancy, training, and technical support to facilitate innovation in the digital economy and green finance. Developing data-sharing mechanisms can further enhance collaboration by ensuring the flow of comprehensive and accurate information between the two sectors. Furthermore, the government should emphasize talent cultivation and interdisciplinary exchange in the digital economy and green finance. Scholarships, research bases, and innovation laboratories can be established to attract and nurture talent with expertise in digital technology and green finance. Encouraging universities and research institutions to engage in interdisciplinary research cooperation will foster exchange and collaboration, facilitating the integration of knowledge from different fields and stimulating innovative thinking[5].

The promotion of collaborative innovation between the digital economy and green finance requires the implementation of various policy measures. These include providing financial incentives, establishing communication platforms, facilitating data sharing, and fostering talent cultivation. By encouraging collaboration and exchange between the digital economy and green finance, sustainable development and economic growth can be effectively advanced.

5. Case Study Analysis

5.1. Analyzing Successful Case Studies of Digitally Empowered Green Finance

Ant Forest is a green finance project launched by Ant Group in China, which empowers users to participate in tree planting activities through digital technology and mobile payment platforms. Users can accumulate "energy points" by making purchases through Ant Group's Alipay app. These energy points can be used to plant virtual saplings in the Ant Forest app. When the virtual saplings grow into real trees, Ant Group plants actual trees in barren areas, promoting the restoration and protection of green ecosystems.

5.2. Success Factors and Lessons Learned

5.2.1. Success Factors

Utilizing digital technology and mobile payment platforms, the success of Ant Forest lies in leveraging the popularity and convenience of digital technology and mobile payment platforms. By integrating with the Alipay app, users can accumulate energy points through their daily consumption and participate in tree planting activities. This convenient mode of participation attracts a large number of users, driving the successful implementation of the project. Engaging user participation and resonance, Ant Forest allows users to personally participate in environmental actions by combining virtual saplings with actual tree planting. Users can see real-time results of their contributions through the app, which stimulates their involvement and resonance, increasing the project's impact[6].

5.2.2. Lessons Learned

Integration of resources and interests, projects that empower green finance through the digital economy require the integration of various resources and interests, including government, businesses, social organizations, and individuals. When promoting the Ant Forest project, Ant Group leveraged its advantages in digital payments and technological innovation, cooperating with governments and environmental organizations to jointly advance the project's implementation. Managing project sustainability, projects that empower green finance through the digital economy need to consider long-term sustainability. The Ant Forest project faced challenges in its early development, such as managing tree planting costs and protecting land resources. To ensure the project's sustainable development, Ant Group collaborated closely with local governments and environmental organizations, establishing a series of measures and standards to ensure the quality and effectiveness of tree planting. This case demonstrates that the practice of digitally empowering green finance can foster the development of green finance by integrating digital technology, mobile payment platforms, and social resources to engage user participation and resonance. However, in the implementation process, it is crucial to consider the integration of resources and interests and manage project sustainability to ensure long-term success.

6. Conclusion

The digital economy is closely related to green finance, providing new opportunities and challenges for the development of green finance. Through the application of digital technology, the efficiency and transparency of green finance are improved, enabling the launch of innovative green financial products and services, and providing investors with more choices and opportunities. The digital economy can also promote the inclusiveness of green finance, allowing more people to participate in green finance investments and consumption, and contributing to the achievement of shared prosperity. The government plays an important role in the integrated development of the digital economy and green finance. It needs to formulate relevant laws and regulations, provide policy support and incentive measures, and guide and regulate the development of the digital economy and green finance. The government can also establish special funds to support the application and innovation of digital economy technologies in the field of green finance. Additionally, the government should strengthen support for talent development in green finance, provide supportive financial services, and promote the collaborative innovation and development of the digital economy and green finance.

Acknowledgements

(1) Social science planning project of Shandong Province “Research on administrative monopoly regulation and enterprise green investment under the strategy of ‘Double carbon’ in Shandong Province”;

(2) Social science planning project of Tai'an City “The research on the influence of corporate financing constraints about Taian digital economy development based on the construction of industrial ecology”

References

- [1] Gao Xing, Li Maisheng. *Digital economy enabling green economic development: Mechanism, practical constraints and path selection* [J]. *Southwest Finance*, 2023, (2): 31-43
- [2] Yao Dengbao, Du Xiaoli. *The effect of digital finance on the efficiency of green economy and its mechanism test* [J]. *Journal of Hubei University of Economics*, 2019, 21(2): 80-90
- [3] Zhao Liang, Guo Junhong. *Digital finance empowers County and rural economic development under Rural revitalization Strategy* [J]. *Henan Agriculture*, 2023, (14): 4-6
- [4] Wang Bin. *Discussion on the path of digital economy enabling green development in Dongting Lake District* [J]. *Industrial Innovation Research*, 2023, (9): 39-41
- [5] Eichhorn Thomas, Juerss Sebastian, Hoffmann Christian P. *Dimensions of digital inequality in the sharing economy* [J]. *Information communication and society*, 202, 25(1a4): 395-412
- [6] Gusmanov Rasul, Stovba Eugene, Paptsov Andrey, Salimova Guzel, Gusmanow Nurali. *Scenario Forecasting of the Agri-Food Sphere in Rural Territories Development in the Conditions of Digital Economy Formation* [J]. *Journal of Industrial Integration and Management: Innovation & Entrepreneurship*, 2002, 7(2): 257-272