

The Mechanism and Realization Path of Digital Finance Development Promoting Carbon Emission Reduction

Youjuan Chen, Longqing Wang

Southwest Petroleum University, Chengdu 610000, China.

Abstract: On the basis of traditional finance, digital finance has strengthened the use of digital technology and big data, with a stronger function of resource optimization and allocation, and has gradually become an important engine for the transformation and upgrading of China's real economy, which also provides a new opportunity to promote carbon emission reduction. By sorting out the mechanism of digital finance to promote carbon emission reduction, this paper puts forward the realization path of digital finance empowering carbon emission reduction, which provides a theoretical basis for China to promote the achievement of the carbon peaking and carbon neutrality goals.

Keywords: Digital Finance; Carbon Emission Reduction; Mechanism; Realization Path

1. Introduction

Global warming and ecological degradation are becoming increasingly prominent, and green and low-carbon development has become a hotspot of concern for the international community. According to the statistics of the World Energy Statistics Yearbook (2023), China's carbon emissions accounted for 30.7% of the world's total in 2022, and the situation of carbon emission reduction is very serious. The proposal of the carbon peaking and carbon neutrality goals put forward higher requirements for China to promote the low-carbon economy, and the realization of the goal requires not only the guidance of the top-level design, but also the support of capital elements. Digital finance, with its stronger function of resource optimization and allocation, has gradually become an important engine for the transformation and upgrading of China's real economy, and also provides a new opportunity to promote carbon emission reduction.

2. Mechanisms of digital financial development for carbon emission reduction

2.1 Digital financial development can optimize the allocation of factor resources

Digital finance, with its wide coverage, low access costs and environmental friendliness, can innovate financial products and services and optimize the allocation of financial resources.

From the perspective of consumers, digital finance promotes carbon emission reduction by innovating financial services and building environmental protection platforms. On the one hand, the development of digital finance has increased access to financial services and facilitated the development of online financial services, while breaking down geographical constraints^[1]. On the other hand, digital finance increases public participation by creating environmental platforms. From the perspective of enterprises, digital finance can help them alleviate financing constraints and effectively integrate information resources, thus helping to reduce carbon emissions.

2.2 Digital financial development can contribute to economic growth

Digital finance can contribute to economic growth, which inevitably has an impact on carbon emissions, in three main ways: first, digital finance can promote the upgrading of the financial industry. It can make up for the shortcomings of traditional financial services and effectively solve the problem of information asymmetry. Second, digital finance can promote consumption. Digital finance alleviates the problem of financial exclusion to a large extent, and more disadvantaged groups can access basic financial services. Third, digital finance can enhance entrepreneurship. Small and medium-sized enterprises in the early stage of entrepreneurship are generally difficult and expensive to finance, digital finance can make a comprehensive prediction of its future development through information technology, discover more high-quality customer resources, and provide more reasonable and efficient financial support for entrepreneurial projects.

2.3 Digital financial development can contribute to technological progress

Digital finance can help SMEs alleviate financing constraints by rationalizing the allocation of financial resources with the help of digital technology, and enterprises will in turn increase their investment in R&D in order to promote technological advancement, which is the key to influencing the environment.

Digital finance can mainly alleviate financing constraints in the following aspects: first, digital finance can enrich the source of funds, reduce the threshold of access to financial services, and broaden financing channels. Second, digital finance can improve the efficiency of capital allocation and reduce the cost of financing. Third, digital finance intensifies competition in the financial industry and forces traditional financial institutions to carry out digital transformation ^[2].

2.4 Digital financial development can promote the optimization of industrial structure

Digital finance optimizes the industrial structure by promoting the advanced and rationalized development of the industrial structure, thus reducing the intensity of carbon emissions.

On the one hand, digital finance helps the development of advanced industrial structure from both the supply and demand sides ^[3]. From the supply side, digital finance helps the development of high-quality emerging industries. From the demand side, the growth of consumer demand promotes the upgrading of industrial structure. On the other hand, digital finance can also help rationalize the development of industrial structure by promoting the rational allocation of resource factors ^[4]. The rapid development of online trading platforms overcomes the limitations of traditional transactions in time and space, promotes the flow of resource factors to efficient sectors, and thus facilitates the rationalization and development of industrial structure.

3. Path to Realization of Digital Financial Development for Carbon Emission Reduction

3.1 Optimize the allocation of factor resources and improve the efficiency of factor allocation

Digital finance uses the optimal allocation of labor, capital, technology and other factors to optimize economic efficiency and thus promote carbon emission reduction. Starting from resource allocation, the following implementation paths are proposed in order to realize carbon emission reduction: first, accelerate the process of digital government construction, and at the same time, strengthen the coordination mechanism of factor resource allocation required for the development of digital finance, in order to ensure the coordinated development of the digital economy and government ^[5]. Second, adhere to the regulatory concept of combining dynamic catering and effective intervention to guide the optimal allocation of factor resources. In addition, strengthen the digital financial regulatory system to ensure the healthy and stable development of the capital elements of the digital economy.

3.2 Accelerate green technology innovation and support the development of green and low-carbon economy

Green technology innovation plays an important role in the enterprise green low-carbon transformation, enterprise green production and operation from the source of pollutant control to the middle of the resource utilization efficiency to the end of the pollutant treatment all need the support of green technology. Therefore, it is particularly important to promote green technology innovation. First, the government should launch continuous encouragement policies related to green technology innovation, so that the field can receive additional incentives and support to safeguard and incentivize green technology innovation ^[6]. Second, strengthen the cultivation of green low-carbon high-end talent, promote the integration of industry and education, help the development of green technology innovation, and ultimately effectively promote energy saving and emission reduction.

3.3 Optimize industrial structure and promote green transformation of economic development

Digital finance can promote carbon emission reduction by promoting industrial structure optimization. To promote the optimization of industrial structure, the first is to promote the transformation of industrial structure and the deep integration of digitization, and give full play to the important role of industrial Internet, big data and artificial intelligence in promoting the optimization of industrial structure. The second is to promote sustainable economic development and the integration of data elements with each entity economy. Third, promoting technolog-

ical innovation is an important intermediary variable in the digital finance-driven upgrading of regional industrial structure, and the relevant regions need to cultivate and attract more innovative resources in order to enhance the research and development capability of technological innovation.

3.4 Give full play to the positive effect of environmental regulation and ensure the development of green and low-carbon economy

Environmental regulation promotes carbon emission reduction by directly influencing and utilizing technological innovation, industrial structure, and foreign direct investment as intermediary mechanisms. First, it is necessary to ensure the effectiveness of environmental regulations^[7]. Second, accelerate the transformation and upgrading of industrial structure. Actively develop new materials, electronic information, artificial intelligence and other emerging industries, and participate in the global industrial chain division of labor and cooperation. Once again, stimulate the innovation vitality of enterprises as a means to guide them to independently develop green technologies and high-tech. While emphasizing that enterprises should bear the environmental costs, the government should increase financial support for their R&D behavior.

4. Concluding remarks

Digital finance, as an increasingly mature new financial industry, has penetrated into all levels of the social economy. In the information age, digital finance is gaining momentum, and as the core of the modern economy, its role in enhancing the quality of China's economic development continues to be highlighted. In order to realize the digital financial empowerment of carbon emission reduction, it is necessary to optimize the allocation of factor resources, accelerate green technological innovation, optimize the industrial structure as well as play a positive effect of environmental regulation. Only in this way can digital finance become a new engine to promote economic transformation and realize carbon emission reduction.

References

- [1] Guo F, Wang JY, Wang F, et al. Measuring the development of digital inclusive finance in China: index compilation and spatial characteristics [J]. *Economics (Quarterly)*, 2020(04): 1401-1418.
- [2] Wang SH, Xie HL. Economic pressure or social pressure: digital finance development and digital innovation of commercial banks [J]. *Economist*, 2021(01): 100-108.
- [3] Xu Z, Gao Y, Huo ZF. Pollution reduction effect of digital finance [J]. *Financial Science*, 2021(04): 28-39.
- [4] Deng RR, Zhang AX. Study on the impact and mechanism of digital economy development on environmental pollution in China [J]. *Southern Economy*, 2022(02): 18-37.
- [5] Wu XX, Ren BP. The path and policy adjustment of reshaping the allocation mechanism of factor resources under the background of digital economy [J]. *Economic System Reform*, 2022(02):5-10.
- [6] Wang XW, Chen MY, Chen NX. Digital economy, green technology innovation and industrial structure upgrading [J]. *Economic Issues*, 2023(01):19-28.
- [7] Wang H, Zhang R. Effects of environmental regulation on CO2 emissions: An empirical analysis of 282 cities in China[J]. *Sustainable Production and Consumption*, 2022, (29): 259-272 .

About the author:

Youjuan Chen(1999-), female, Han nationality, born in Guang 'an, Sichuan Province, master candidate, institution: Southwest Petroleum University, research direction: Resources and Environmental economics.