

A Study of the Impact of Digital Finance on Corporate Carbon Emissions

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Abstract: Digital finance is a new type of financial form that integrates digital technology with traditional finance, and digital finance can promote the decline of corporate carbon emissions. Through analysis, this paper finds that the influence mechanism of digital finance on enterprise carbon emissions is mainly reflected in the following aspects: digital finance can provide enterprises with more convenient, efficient and low-cost capital financing, and reduce the financing constraints. Digital finance can provide enterprises with more diversified risk management tools, and reduce the risks brought by information asymmetry, and it can provide enterprises with a more effective risk pricing mechanism, improving the ability of enterprises to cope with risks. Based on the above analysis, it is found that there are problems in the current digital finance to reduce enterprise carbon emissions and improve the ability of enterprises to cope with risks. Based on the above analysis, we find that there are deficiencies in the current digital finance to reduce carbon emissions of enterprises, and put forward relevant suggestions.

Keywords: Digital Finance; Carbon Emissions; Financial Innovation; Green Economy

1. Introduction

As the dual carbon target is proposed, China's financial sector is speeding up its transition to a green and low-carbon economy. Compared with traditional finance, digital finance is a new kind of finance, which is a combination of digital and traditional finance. With the aid of digital technology, we have added online and Internet services, which are based on the traditional financial system, to lower the transaction cost and improve the efficiency. Along with the fast development of digital

economy in China, data is very important to the real economy. It also provides a new way for CO₂ management and environment management. In 2020, according to the China Digital Inclusive Finance Indicators Analysis Report, the Chinese Digital Inclusive Finance Index reached 184.4 at the end of 2020. This indicates that the development of digital inclusive finance in China is rapid. Currently, the study on the enterprise carbon emissions from digital finance is inadequate. Although some studies show that digital finance will have an impact on CO₂ emissions, it is necessary to improve its mechanism.

2. Literature

In recent years, due to the rapid development of digital and Internet technologies, digital finance has become an essential component of the financial system. This is a new area, which is changing the traditional model of financial services and profoundly affecting environment policy. The role and impact of digital finance, in particular, has come under increasing attention from academia and policymakers. Digital finance has dramatically improved the effectiveness and scope of financial services, making a direct contribution to reducing carbon emissions [1-3]. By means of digital platforms, for example, banks and other financial institutions can more effectively manage and monitor lending, thus reducing energy consumption and pollution. Moreover, digital finance can reduce carbon emissions indirectly through the optimization of industry structure. The results show that, when the industry structure is not optimized, the development of digital finance can improve the efficiency of resource allocation, which will have a positive effect on CO₂ emissions [4,5]. But research has also shown that digital finance is closely related to carbon emissions. For one thing, Digital finance has the potential to substantially cut carbon intensity, particularly in regions with optimised

industrial fabric [6,7]. This relationship, on the other hand, is not always linear, and sometimes even exhibits a nonlinear "U" property[8]. This indicates that the development of digital finance can be accelerated and then reversed, which can be reflected in different regions.

A more detailed analysis of these mechanisms reveals the multiple ways in which digital finance can influence carbon emissions. Some research suggests that green technology innovation can act as an intermediary, bringing digital finance to cut carbon emissions through the promotion of green investment and technology. Meanwhile, the role of traditional financial institutions should not be overlooked, as they play a key role in developing digital finance by adapting their business strategies and products to new economic and environmental circumstances [9]. In addition, Spatial heterogeneity analysis indicates that there is a difference between the direct and indirect efforts made by digital finance in terms of carbon emissions across different regions. Direct and indirect impacts are more pronounced in the Middle and East, but not in the West [10]. This may be related to the level of economic development, industry structure and policy support.

3. Pathways for Digital Finance to Influence Corporate Carbon Emissions

Digital finance, as a newly emerging financial sector, not only offers the advantages that the traditional financial institutions can not provide, but also reduces the financing constraints of the traditional financial market. Digital finance offers more convenient, efficient and low-cost financing for enterprises. Digital finance offers a variety of instruments to manage risk, and reduces the risk of asymmetric information. On the basis of the above analysis, we can find out the effect of digital finance on the carbon emissions of enterprises.

Firstly, it is possible that digital finance will provide more convenient, effective and low-cost financing. Traditional banks need a series of complex processes, whereas digital finance is based on large data technology to optimize, upgrade, transform and restructure the traditional bank credit process.

Business process of finance.

On the one hand, the digital finance can connect with the traditional banking process

smoothly by constructing the online financing platform; on the other hand, it establishes the data exchange bridge and the data sharing channel, which can reduce the processing time of the credit business. Furthermore, the digital finance can offer a real time on-line service platform between the business and the bank, thus increasing the efficiency of the credit business. Second, the digital finance offers more diversified tools for the enterprise to manage risk. Asymmetric information is of great importance in the traditional financial market. But in the digital economic times, with the extension of the application scope of big data technology, the information asymmetry can be largely alleviated.

On the one hand, digital finance can monitor, detect and alert potential risks by setting up an online risk management platform. Digital finance, on the other hand, can exploit and analyze existing risk factors by means of big data. For instance, it is possible to build a credit rating model on the basis of analyzing and dealing with financial data and customer credit information.

Traditional bank pricing is based on the borrower's ability to forecast and calculate a fixed interest rate. But in the context of digital economy, this approach does not suit the development of new business. Therefore, it is necessary to make a dynamic adjustment of risk pricing mechanism and model to improve the ability of prediction of future risk events.

4. Shortcomings of Digital Finance in Reducing Corporate Carbon Emissions

In the case of digital finance, the impact of digital finance on companies' carbon reduction is lower, mainly because:

(i) Digital finance does not actually permeate the production and operation of an enterprise. Corporate carbon emissions are mainly generated by the CO₂ produced in the production process. But China's enterprises are usually small in size, weak in competition and low in management, so they can't satisfy the need of digital finance. Therefore, we should pay more attention to the actual conditions of Chinese enterprises in the development of digital finance, so that we can find out the key factors which influence the carbon emission of enterprises.

(ii) The creation of a truly multi-tiered, all-pervasive carbon market in digital finance has

not yet been established. Currently, China's carbon market is not sound, and the carbon trading system is not perfect. There are not enough connections among the carbon markets. As Information Technology and Big Data Technology develop, Digital Finance can effectively reduce the financial risk. There are, however, some problems.

There are still a number of asymmetric information in the business. In the meantime, traditional banks, insurance companies and other agencies are under increased risk management pressure. Therefore, the establishment of multiple levels of risk management system is essential for the effective reduction of CO₂ emissions. It is necessary to develop digital finance.

5. Policy Recommendations

Digital finance is the combination of digital and traditional finance. It is low-cost, highly efficient and digital. At present, China attaches great importance to the "double carbon" target. Digital finance can achieve long lasting results by means of innovation, risk control and management. In order to improve China's CO₂ emission reduction, the following proposals are proposed.

(i) Actively support the highly digitized carbon trading entities

In the development of digital finance, the traditional financial institutions tend to focus more on credit rather than on business financing, which leads to the low acceptance of digital financial products. Therefore, it is necessary for the financial institutions to adopt Big Data, Cloud Computing and Blockchain to promote the digital transformation.

(ii) Innovation in digital financial products and services to address corporate carbon emissions requirements

The innovative capability of digital finance is the key to cut carbon emissions. Research on Digital Finance Can Fully Explore Corporate Carbon

Based on the characteristics of different industries, we design products and services to satisfy the individual needs of the enterprises, thereby reducing the carbon emissions.

(iii) Encouraging the establishment of carbon trading platforms and the establishment of cooperation mechanisms by large enterprises And the exchange of green finance.

Through the integration of the national carbon

market data, the enterprise can reduce the transaction cost effectively, combine the carbon market with the financial market, and promote the active participation of the big business. The Chinese carbon market is still dominated by SMEs, but the big companies, which have great financial power and technical ability, are able to set up CO₂ trading platform with big companies, and use their influence to give SMEs more financing channels. Meanwhile, the establishment of cooperation and exchange mechanism of green finance will help the financial institutions to better understand and serve SMEs.

(iv) Establishing a CO₂ monitoring and reporting system using big data analysis

In the Digital Financial Age, Information Technology, Big Data Technology and so on will greatly improve the ability of CO₂ monitoring and reporting.

Firstly, digital finance can set up a system for monitoring and reporting of CO₂ emissions, and offer the necessary technical support. For instance, it can supply the enterprise with accurate and complete carbon emission data, which can provide a reasonable judgement basis for the enterprise to implement the green financing. Secondly, digital finance can build a more complete monitoring and reporting system based on the analysis of production, operation, financial data and so on. Last but not least, digital finance can make use of big data analysis technique to clean, organize and analyse the data, and offer green finance service.

6. Conclusion

Because with digital technology and the adoption of innovative financial products and services, the role of digital finance in mitigating corporate carbon emissions becomes increasingly significant. While it may take time for the full potential of digital finance to be realized, its ability to lower carbon emissions is already beginning to shape the future of the digital economy. The integration of AI and machine learning algorithms into financial management can help identify areas where companies can reduce their carbon footprints, by providing insights into energy consumption, transportation patterns, and even industrial processes that contribute to emissions. By offering tailored solutions that incentivize green practices or

enhance energy efficiency, digital finance is paving the way for a more sustainable business model. Additionally, through online platforms and mobile applications, digital finance's reach extends beyond traditional banking channels, enabling companies to access capital and advice from a global network of experts without the need for physical presence. This democratization of financial resources also contributes to the reduction of carbon emissions as it reduces the need for travel and office space, thereby lowering carbon intensity. As this trend continues, we can anticipate an even greater impact of digital finance on corporate sustainability and climate action. Of Chinese digital technology, big data technology and AI technology, digital finance can offer better services and products to the enterprises. In the long term, digital finance will push forward the transformation and upgrade of the enterprise's production and operation, and provide more impetus for the reduction of carbon emissions and the realization of green development. Of course, due to the large amount of data generated by the application of digital finance, it is necessary to enhance the integration of GIS with AI, so as to enhance the effectiveness of digital finance in reducing CO2 emissions.

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