



Research on the Impact of Green Finance on the Carbon Emissions Trading Market

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Abstract: Reducing carbon emissions has grown more and more important as global climate change gets worse. In light of this, research on the effect of green finance on the carbon emissions trading market (CETM) has emerged, which has been the subject of several research, is thoroughly examined in this article. Green finance has rich connotations and covers various financial instruments. The market for carbon emissions trading functions in accordance with the principles of total control and trading. Green finance has multiple impacts on the CETM. In terms of financial support, green loans, bonds, etc. provide funds for market participants, promoting more enterprises to get involved in the market. With regard to the price discovery mechanism, the inflow of green finance funds affects the expected demand for quotas, and the emission reduction projects it supports affect the supply of quotas. The combined effect of the two promotes the formation of more reasonable prices. In short, green finance exerts a substantial influence on the CETM.

Keywords: Green Finance, Carbon Emissions, Carbon Trading, Market.

1 Introduction

Reducing carbon emissions has become a crucial part of sustainable development plans for nations all over the world due to the growing issue of global climate change. In this regard, governments and businesses worldwide have been paying more and more attention to the carbon emissions trading market (CETM) as a market-oriented emission reduction mechanism. While green finance as an important branch of sustainable development finance, is a "marketization means" to achieve the dual carbon goals and is currently rapidly developing globally. Green finance provides strong support for developing the carbon trading market by guiding funds towards low-carbon and environmental projects.

At present, research has mainly focused on three directions. First, exploring the correlation between green finance and CETMs. Yifan Wang et al. It is believed that green finance tools can help enterprises and investors manage risks in the CETM and the CETM can also provide investment opportunities for green finance, complementing each other [1]. The second is to study the role of green financial instruments (green bonds, green funds etc.) in the CETM. Aaron Maltais et al. believe that green bonds can effectively promote the activity of the CETM and provide more revenue

channels for the issuance of green bonds [2]. Yuduan Wang found that green funds can promote energy conservation and emission reduction of enterprises and affect market activity; The third is to pay attention to the cooperation between green finance and CETMs in terms of policies [3]. Hongwei Yu emphasizes that green finance supported by policies can more effectively promote the development of CETMs, and the two policies have a mutual influence [4].

This article aims to study multiple literature on green finance and CETMs, explore the impact of green finance on the CETM, and reveal the interactive relationship between the two. By analyzing the main tools of green finance, such as green bonds, and green funds, and their main mechanisms in the carbon trading market, explores how green finance can promote carbon emissions reduction, improve market liquidity, and enhance policy coordination. It also analyzes the influences and potential challenges of green finance on the CETM.

In order to encourage the coordinated growth of green finance and carbon trading markets and attain economic, social, and environmental sustainability, this study offers insightful information through a thorough examination of the relationship between these two markets.

2 Concept Explanation

By offering financial services in fields like clean energy, green transportation, and environmental protection, green finance is a model that incorporates sustainable development and environmental protection into financial investment decisions with the goal of promoting sustainable economic, social, and environmental development. Green bonds and green funds are two of the many tools included in this financial paradigm. At the same time, Huang et al. and Muhammad Saeed Meo et al. think the CETM as a market-based greenhouse gas emission reduction policy tool, allows companies to engage in buying and selling transactions in the market by setting a cap on total carbon emissions and allocating carbon emission rights, incentivizing companies to reduce carbon emissions [5,6]. Thus, it is crucial to combat climate change that green finance and CETMs are closely related. All nations now share the objective of lowering carbon emissions as a result of the acceleration of global climate change. As shown in figure 1, taking China as an example, from 1984 to 2002, it was in the early stage of economic development after the reform and opening up. The industry was mainly labor-intensive and basic industries, with limited energy demand and small economic scale. Coal consumption and carbon dioxide emissions steadily increased. From 2002 to 2012, China's carbon emissions rapidly increased. On the one hand, China's economy developed rapidly and after joining the WTO, foreign trade drove industrial expansion. During the peak period of infrastructure construction, the demand for high energy consuming raw materials such as steel and cement increased significantly; On the other hand, the energy structure is single and the proportion of new energy development in the initial stage is extremely low due to technological and cost limitations, which exacerbates coal dependence. After a decline from 2012 to 2020, it tended to stabilize, which was due to the initial effectiveness of energy-saving

and emission reduction policies, such as increasing the energy consumption limit standards for high energy consuming enterprises, supporting the development of clean energy, promoting the technological transformation of energy conservation and emission reduction in enterprises and improving energy utilization efficiency through technological progress. In addition, industrial restructuring has led to a decrease in the proportion of traditional high energy consuming industries and an increase in the proportion of low energy consuming industries such as service industries and high-tech industries. From 2020 to 2022, carbon emissions will rise rapidly again. After the impact of the epidemic the economy has recovered and government stimulus measures have led to a rebound in energy demand. In addition, global energy supply is tight and new energy cannot completely replace coal in the short term. Coal demand will further increase, so energy conservation and emission reduction cannot be delayed. By deeply analyzing the impact of green finance on the CETM, people can better understand the interrelationship between the two optimize resource allocation and improve emission reduction efficiency. This not only provides the theoretical basis for policy makers but also promotes the coordinated development of green finance and CETMs helping countries achieve their carbon peak and carbon neutrality goals as soon as possible.

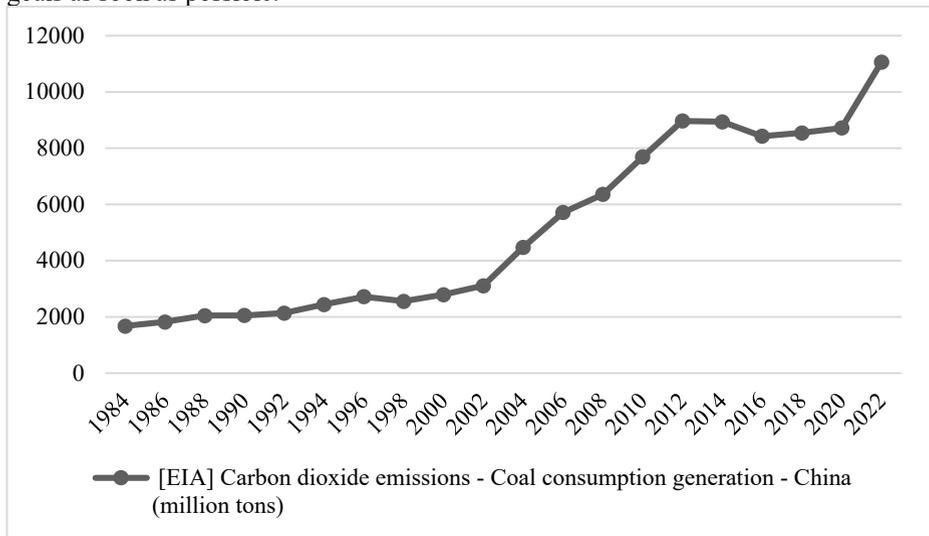


Fig.1. [EIA] Carbon dioxide emissions - Coal consumption generation - China (million tons)

3 The Impact Mechanism of Green Finance on the Carbon Emissions Trading Market

3.1 Financial Instruments

In the process of studying the impact of green finance on the CETM, although green credit also provides funding for environmental projects, its operation mode and impact mechanism are relatively traditional, and it is often constrained by credit policies

and risk management. Its approval process is longer, and the flow of funds is slower, which may have a less significant direct impact on the CETM than green bonds and green funds. In addition, the market awareness and development level of green credit are relatively low, and it has not yet formed a sufficient market size and influence. Green insurance mainly provides risk protection for green projects. Although it can support the financing of green projects to a certain extent, its direct impact on the CETM mechanism is relatively complex and indirect. Therefore, in this study, green bonds and green funds as financial instruments that directly participate in and promote the development of the CETM have more research value and empirical significance. Therefore, the following will mainly elaborate from these two perspectives.

Angle 1: Green Bonds. Green bonds, as an important component of green finance, have brought new sources of funding to the CETM. The issuance of green bonds is conducive to attracting more investors' attention to green projects, including those related to carbon emission reduction. For example, as mentioned Aaron Maltais et al., the construction of new energy projects can reduce reliance on traditional energy sources, thereby reducing carbon emissions [2]. Additionally, the reduced carbon emission rights can be sold through the CETM to generate additional revenue. This not only promotes the activity of CETM, but also provides more revenue channels for the issuance of green bonds.

Angle 2: Green Funds. Green funds mainly invest in green industries and their investment direction has a significant impact on the CETM. Wang mentioned that green funds focus on investing in enterprises with low-carbon technology innovation capabilities [3]. After receiving financial support, these enterprises can raise their funding for the development and use of emission-reduction and energy-saving technologies. With the improvement of enterprises' emission reduction capabilities, In the CETM, their supply and demand for carbon emission rights will also shift. For instance, if a company reduces its carbon emission intensity through technological innovation, it may have more carbon emission rights available for sale, consequently impacting the CETM's supply-demand equilibrium.

3.2 Impact of Capital Flow and Investment Direction

Zhang mentioned that green finance has changed the participant structure and fund distribution in the CETM by guiding funds toward green industries and low-carbon projects [7]. Driven by green finance, more funds are flowing from high-carbon industries to low-carbon industries. For the CETM, this means that more companies have the ability and motivation to carry out energy-saving and emission-reduction renovations. For example, some traditional energy companies may use green finance funds to transform into clean energy enterprises and their role in the market for trading carbon emissions will gradually shift from being the main buyers of carbon emissions rights to sellers.

3.3 The Role of Risk Management and Price Discovery

Green financial instruments can help businesses and investors manage risks in the market for trading carbon emissions. For case in point, Huang et al. mentioned that the fixed-income characteristics of green bonds can provide investors with relatively stable returns and reduce their investment risks in the CETM [5]. Meanwhile, Wang et al. also mentioned that the development of green finance markets can contribute to price discovery in the CETM [3]. As more green financial products are associated with carbon emissions, the value information about carbon emissions in the market becomes more abundant, which can more accurately reflect the true value of carbon emission rights.

3.4 The Relationship between Policy Support and Incentive Mechanisms

The government plays an important role in both green finance and CETMs. Yu wrote that green finance supported by policies can provide more incentives for the CETM [4]. For example, the government's tax incentives for green bonds can attract more investors and increase the issuance of green bonds. These funds can be further invested in projects related to the CETM, such as the research and development of carbon capture and storage technologies. In the words of Chen et al., the policies of the CETM will also have an impact on the direction of green finance development[8]. For case in point, the distribution of carbon emission quotas will have an impact on the financing requirements of businesses and the creation of green finance instruments.

4 Development Path

4.1 The Development Trend and Challenges Faced by the Carbon Emissions Trading Market

At present, countries are increasingly concerned about climate change and the CETM is showing a continuous expansion trend. Numerous nations and areas have started to set up their own systems for trading carbon emissions and the increasing number of market participants and rising trading prices reflect the growing demand for carbon quotas in the market. In addition, in the wake of the ever-intensifying environmental protection awareness the laws and regulations of various countries are constantly improving, providing a more solid institutional guarantee for the healthy development of the CETM [9]. However, the CETM still faces some challenges. As Yu mentioned, the pricing mechanism for carbon emission rights is not yet perfect and there is a lack of effective connections between CETMs within distinct regions, resulting in insufficient market liquidity [4]. In addition, data quality issues are also an urgent challenge that needs to be addressed. Market participants require high-quality and transparent data to make informed trading decisions and existing data standards and reporting mechanisms have not yet been unified. Finally, regulatory difficulty is also a major factor affecting market development. The complexity and variability of the carbon market pose challenges for regulatory agencies in ensuring market fairness and effectiveness.

4.2 Policy Suggestions and Practical Directions

To address the challenges, policymakers will take a series of measures. Firstly, strengthen international cooperation and coordination to create a common market standard for carbon emissions pricing. Second, further enhance the carbon emission rights pricing mechanism while taking into account all relevant variables, including environmental costs and market supply and demand. In practice, Qiao and Yu mentioned that enterprises should actively explore the integration of green finance and CETMs and use green finance tools to reduce their emission reduction costs [10,11]. To better serve the demands of the CETM, financial institutions should also develop innovative green financial products and services.

5 Conclusion

In conclusion, the CETM is impacted by green finance in a number of ways. Green finance influences the growth and functioning of the CETM in terms of capital flow, risk management, and policy linkage through financial products like green bonds and green funds. At the same time, the development of CETMs has provided new opportunities and directions for green finance, and the two complement each other. Of course, both also face some challenges in their development process which require scholars to work together to address them.

For the future, people can explore the following aspects: firstly, further research the quantitative relationship between green financial instruments and CETMs and establish more accurate models to evaluate their impact. Secondly, pay attention to the potential impact of emerging green financial products and technologies on the CETM such as the application of green financial technology. The third is to study how to achieve coordinated advancement of green finance and CETMs under policy differences across diverse regions worldwide to address the challenges of global climate change.

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