

Research on fiscal and tax incentive policies for carbon emission reduction in China under the “dual carbon” goal

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Abstract

Against the backdrop of global climate change, China has proposed the "dual carbon" goal, namely, achieving carbon peak by 2030 and carbon neutrality by 2060. This paper aims to study the impact of fiscal and tax incentive policies on China's carbon emission reduction. Through literature research and comparative analysis, this paper first sorts out the relevant literature on carbon emission reduction and fiscal and tax policies, analyzes the basic theory of fiscal and tax policies promoting carbon emissions, and forms a theoretical basis. Subsequently, this paper describes the current status of China's carbon emissions and corresponding carbon emission reduction actions, measures and analyzes the current practice status of China's current carbon emission reduction fiscal and tax policies, and points out the existing problems. Through the analysis of typical cases such as the Beijing carbon emission trading pilot and Shanghai's green finance policy, this paper reveals the specific role and actual effect of fiscal and tax policies in carbon emission reduction. International comparative analysis shows the successful experience of countries such as Sweden, the United Kingdom, Denmark and Japan in carbon tax and environmental protection tax. Finally, based on the above research conclusions, this paper puts forward countermeasures and suggestions for optimizing China's carbon emission reduction fiscal and tax policies, aiming to better achieve the "dual carbon" goals. This study provides a scientific basis for policymakers and helps promote China's low-carbon transformation and sustainable development.

Keywords

Dual carbon goals, carbon emission reduction, fiscal and tax incentive policies, international comparative analysis.

1. Introduction

1.1. Research background

Global climate change has become one of the most serious challenges facing the world today, and the greenhouse effect caused by carbon emissions is the main reason. Excessive emissions of greenhouse gases such as carbon dioxide have led to rising global temperatures, frequent extreme weather events, and damage to ecosystems, threatening human survival and development. In response to climate change, the international community has pledged to take specific measures to reduce carbon emissions under the framework of the Paris Agreement. As one of the world's largest carbon emitters, China shoulders major responsibilities and obligations. To this end, the Chinese government has proposed a "dual carbon" goal, namely, striving to achieve carbon peak by 2030 and carbon neutrality by 2060. The proposal of this goal marks China's positive attitude and firm determination in global climate governance.

1.2. Research significance

Achieving the "dual carbon" goal is of great significance to China's economic restructuring, energy structure optimization and ecological environmental protection. In this process, fiscal

and tax incentive policies, as an important means for the government to regulate the economy, play an indispensable role. By implementing effective fiscal and tax policies, the government can guide resource allocation, encourage enterprises and individuals to engage in low-carbon production and consumption, promote green technology innovation, and promote the development of a low-carbon economy. Therefore, studying carbon emission reduction fiscal and tax policies will not only help understand their role in emission reduction, but also provide a scientific basis for policymakers to ensure the effectiveness and feasibility of policy implementation. At the same time, this research will also help promote international cooperation in the field of climate governance and contribute Chinese wisdom to the realization of global carbon emission reduction goals.

1.3. Research objectives and methods

The research objective of this paper is to systematically analyze the role and effect of fiscal and tax incentive policies in China's carbon emission reduction process and put forward optimization suggestions. To achieve this goal, this paper adopts literature research and comparative analysis methods. First, by combing the relevant literature on carbon emission reduction and fiscal and tax policies at home and abroad, a theoretical framework for fiscal and tax policies to promote carbon emission reduction is constructed. Secondly, the current status of China's carbon emissions and the implementation of the current carbon emission reduction fiscal and tax policies are described and analyzed, revealing the problems. Finally, this paper summarizes the implementation effects of different fiscal and tax policies through the analysis of typical cases at home and abroad, and draws on international successful experiences to propose a fiscal and tax policy optimization plan suitable for China's national conditions. Through this systematic research process, this paper hopes to provide strong policy support and theoretical guidance for China to achieve its "dual carbon" goals.

2. Current status and development trends of research at home and abroad

2.1. Research on factors affecting carbon emissions

Kahouli (2018) used the method of generalized moment estimation to analyze data from 1990 to 2016 and concluded that R&D investment contributes to carbon emission reduction. Wang Yi (2019) believes that the impact of energy structure on carbon emissions is crucial. Cheng (2021) believes that the scale and structure of local fiscal expenditure have a greater impact on carbon emissions. Khan (2021) confirmed that fiscal decentralization will affect institutional construction and human capital, and thus affect carbon dioxide emissions. Jain (2021) used data from nine Asian economies to study and concluded that when revenue and expenditure power is more decentralized to the next level, Asia's carbon emissions will decrease; and when fiscal expenditure becomes decentralized, carbon dioxide emissions will increase. Shao Shuai (2022) believes that factors affecting carbon emissions include economic growth, energy structure, industrial structure, population, opening up to the outside world, scientific and technological research and development, fiscal decentralization, etc. Xue Fei and Chen Xu (2022) believe that controlling energy consumption, keeping energy consumption per unit of GDP at a low level, and applying more green technologies are effective means to achieve carbon emission reduction.

2.2. Research on fiscal and taxation policies to promote carbon emission reduction

Zhang Hua (2020) proposed that the implementation of low-carbon city construction can reduce electricity energy consumption to a certain extent, achieve technological innovation, and thus achieve the goal of carbon emission reduction. Xue Fei and Zhou Minliang (2021) proposed through research that when the scale of the carbon trading market increases, it is

more conducive to achieving the goal of carbon emission reduction. Shi Mingxia (2022) believes that the green tax system can better control carbon emissions, and carbon emissions are dynamic and have the characteristics of continuous accumulation. The carbon emission level of the previous period will have a positive effect on the level of the current period. Apoorva's (2022) research allows us to understand whether carbon tax is politically feasible. Finland and Denmark have adopted carbon taxes; Germany has adopted relevant energy taxes; Canada refuses to levy carbon taxes. These cases highlight the role of policy entrepreneurs in promoting environmental taxation. However, whether the carbon tax policy is feasible depends on voters' concern about the environmental or economic benefits of carbon tax. Chen Guojin (2023) pointed out that the carbon tax policy helps to reduce emissions and promote the low-carbon transformation of industries, but it may cause "stagflation" in the short term, and at the same time it will have a significant impact on asset prices, threaten financial stability, and there are certain transformation risks.

3. China's Carbon Emissions Status and Carbon Reduction Actions

3.1. Current status of carbon emissions in China

China is currently the world's largest carbon emitter, accounting for nearly 30% of the world's total carbon emissions. According to data from the National Bureau of Statistics, China's carbon dioxide emissions reached about 10.4 billion tons in 2020. China's carbon emission structure is mainly dominated by fossil fuel combustion, among which coal consumption accounts for the largest proportion, accounting for about 70% of total emissions. In addition, the consumption of oil and natural gas also contributes significantly to carbon emissions. In recent years, although China's total carbon emissions have been increasing, its carbon emission intensity (carbon emissions per unit of GDP) has gradually declined, indicating that China is working hard to achieve the goal of decoupling economic growth from carbon emissions. Specific data show that China's carbon emission intensity has decreased by about 30% between 2010 and 2020. This trend reflects China's efforts to improve energy efficiency, optimize energy structure and promote green development.

3.2. Carbon reduction actions and policy framework

In order to achieve the "dual carbon" goal, the Chinese government has taken a series of systematic and comprehensive carbon emission reduction actions and policy measures. These measures cover policy documents, laws and regulations, and international commitments. First, in terms of policy documents, the Chinese government has successively issued the "Interim Regulations on Carbon Emission Trading Management", "National Climate Change Adaptation Strategy", "Guidelines for the Construction of a Green Financial System", etc., and has established a relatively complete policy framework. Secondly, at the level of laws and regulations, through laws and regulations such as the "Environmental Protection Tax Law of the People's Republic of China", strict management of carbon emissions and pollutant emissions is carried out. At the same time, China has also established a national carbon emission trading market to effectively allocate carbon emission quotas through market-based means to promote corporate emission reduction. In addition, China actively fulfills its international commitments and participates in global climate governance. Under the framework of the Paris Agreement, it has pledged to achieve carbon peak by 2030 and promote global green development through the "Belt and Road" initiative. These comprehensive measures reflect China's strategic deployment and firm determination in carbon emission reduction.

4. Current status of China's fiscal and taxation policies for carbon emission reduction

4.1. Overview of current fiscal and taxation policies

China's current fiscal and taxation policies for carbon emission reduction mainly include carbon tax, environmental tax, fiscal subsidies and tax incentives. Although the carbon tax policy has not yet been fully implemented nationwide, pilot projects have been carried out in some regions. The environmental tax has been officially implemented in 2018. By levying taxes on pollutant emissions, it increases the emission costs of enterprises and encourages them to reduce emissions. The fiscal subsidy policy is mainly aimed at renewable energy and energy-saving projects, such as providing financial support for new energy projects such as solar energy and wind energy, and encouraging enterprises and individuals to adopt clean energy. Tax incentive policies include tax exemptions for the purchase of energy-saving and emission-reduction equipment, green technology research and development, etc., to reduce the operating costs of enterprises and encourage them to make green investments. The comprehensive application of these policies has provided strong fiscal and taxation support for China's carbon emission reduction work.

4.2. Analysis of the effectiveness of policy implementation

Evaluating the implementation effect of China's current carbon emission reduction fiscal and taxation policies, it can be found that it has achieved certain results in reducing carbon emissions. For example, since the implementation of Beijing's carbon emission trading pilot, the carbon emission intensity of participating enterprises has dropped significantly. Through technological transformation and energy-saving and emission reduction measures, some high-energy-consuming enterprises have achieved a significant reduction in carbon emissions. In addition, Shanghai's green financial policies have also effectively promoted the financing and implementation of a large number of green projects, and promoted the development of clean energy and energy-saving and environmental protection industries. According to statistics, since the implementation of the environmental protection tax in 2018, the pollutant emissions of several key monitored enterprises have dropped significantly. Overall, these fiscal and taxation policies have played a positive role in promoting the transformation of a low-carbon economy, improving energy efficiency, and reducing pollution emissions.

4.3. Existing problems

Although the current fiscal and taxation policies have achieved some results in carbon emission reduction, there are still some problems in the implementation process. First, the policy coverage is limited, and the carbon emission control efforts in some regions and industries are insufficient, resulting in uneven overall emission reduction effects. Second, the incentives are not strong enough. The current fiscal and taxation policies lack sufficient economic incentives in some aspects, resulting in low enthusiasm for corporate emission reduction. In addition, the policy implementation is uneven, and there are large differences in policy implementation in different regions. Some local governments may not implement carbon emission reduction targets in place. Finally, policy coordination needs to be strengthened. In the specific implementation process, the existing fiscal and taxation policies often lack effective coordination with other economic and industrial policies, which affects the overall policy effect. These problems need to be improved in future policy design and implementation to better achieve China's carbon emission reduction goals.

5. Case studies and international comparative analysis of fiscal and taxation policies on carbon emissions

5.1. Analysis of domestic cases

First, take Beijing's carbon emissions trading pilot as an example. Since 2013, Beijing has become one of the first carbon emissions trading pilot cities in the country and has taken the lead in implementing carbon emissions trading policies. The core content of this policy includes carbon quota allocation, carbon trading market establishment, corporate carbon emissions reporting and verification, etc. By establishing a market-oriented carbon trading mechanism, Beijing can better guide enterprises to reduce carbon emissions and improve energy efficiency. The actual results show that the carbon emission intensity of some high-energy-consuming enterprises has dropped significantly, which shows that the carbon trading policy has played a positive role in promoting carbon emission reduction. Secondly, Shanghai's green finance policy is also a typical case. As a national financial center, Shanghai has actively promoted the development of green finance in recent years. Its main policy contents include green bonds, green credit and green funds, etc., which aim to encourage enterprises to make green investments and technological innovations. The implementation of these policies has effectively promoted the financing of low-carbon projects and promoted the development of clean energy and energy-saving and environmental protection industries. Through the analysis of Shanghai's green finance policy, we can see that green finance plays an important role in supporting the green transformation of enterprises and promoting carbon emission reduction.

5.2. International Case Analysis

Internationally, the EU Emissions Trading System (EU ETS) has been implemented since 2005 and is one of the largest carbon markets in the world. The main contents of the system include carbon quota auctions, corporate carbon emissions monitoring and reporting, etc. Through the market-based carbon trading mechanism, the overall carbon emissions of the EU have dropped significantly, the carbon market price has stabilized, and an effective incentive has been formed for corporate emission reduction behavior. In addition, the carbon emissions trading system in California, USA is also a typical case worthy of reference. California has implemented a carbon emissions trading policy since 2013, covering multiple fields such as electricity, industry and transportation, and adopting a combination of quota restrictions and market transactions. Since the implementation of the policy, California's carbon emissions have declined year by year, while maintaining sustained economic growth.

5.3. International comparative analysis

By comparing the fiscal and taxation policies of different countries and regions, we can summarize the effective carbon emission reduction policy experience and provide reference for China's realization of the "dual carbon" goal. First, in terms of carbon tax policy, the experience of Sweden and the United Kingdom is worth learning from. Sweden has implemented carbon tax since 1991, and the tax rate has increased year by year, significantly reducing fossil fuel use and carbon emissions. In 2013, the United Kingdom introduced a carbon price floor policy, which stabilized the carbon market price by setting a minimum carbon price and promoted low-carbon transformation. The experience of the two countries shows that high tax rates and stable carbon price mechanisms have formed a strong incentive for enterprises and individuals to reduce emissions. Secondly, in terms of environmental tax policies, the practices of Denmark and Japan are of reference value. Denmark has implemented environmental taxes since 1993, covering energy, waste and pollutant emissions, etc., which has promoted the development of renewable energy and environmental protection. The environmental tax implemented by Japan is mainly aimed at carbon dioxide emissions, and the revenue is used to support the research and development and promotion of low-carbon technologies. The policies of these countries

show that broad policy coverage and effective policy supporting measures can enhance the emission reduction effect of fiscal and taxation policies.

6. Countermeasures and Suggestions

6.1. Policy recommendations based on research conclusions

Through the research and analysis in the previous article, my country's current carbon emission reduction fiscal and taxation policies have achieved certain results in promoting carbon emission reduction, but there are also problems such as limited coverage, insufficient incentives, and uneven implementation. In order to improve the design of fiscal and taxation policies, first of all, the policy coverage should be expanded to include more regions and industries in the scope of carbon emission reduction policies to ensure the comprehensive implementation of the policy. Secondly, fiscal and taxation incentives should be increased, and measures such as raising carbon tax rates and expanding the scope of fiscal subsidies should be taken to further encourage enterprises and individuals to actively participate in carbon emission reduction. Thirdly, it is necessary to strengthen policy implementation to ensure that governments at all levels and relevant departments strictly implement carbon emission reduction policies and avoid local governments making concessions during implementation. Finally, the coordination of policies should be enhanced, and the coordination between different policies should be strengthened to ensure that carbon emission reduction fiscal and taxation policies and other economic policies and industrial policies support each other and form a synergy.

6.2. Optimization of fiscal and taxation policies towards the "dual carbon" goals

In order to achieve the "dual carbon" goal, my country needs to formulate a systematic and forward-looking fiscal and taxation policy optimization plan. First, policy innovation is the key. We can explore the implementation of a national carbon tax policy, gradually expand the coverage of the carbon market, and establish a sound carbon trading mechanism. Secondly, institutional improvement is a guarantee. The legal and regulatory system for carbon emission reduction should be improved to ensure the long-term stability and operability of the policy. In addition, international experience is also very important. We can learn from the successful experience of countries such as Sweden and the United Kingdom in carbon tax and environmental protection tax, and formulate carbon emission reduction fiscal and taxation policies suitable for our country in combination with China's national conditions. For example, we can learn from Sweden's practice of increasing carbon tax rates year by year to enhance the policy's sustained incentive effect. Through policy innovation, institutional improvement and international experience, we can form an effective fiscal and taxation policy system to help my country achieve the "dual carbon" goal.

7. Conclusion

7.1. Research Summary

This paper systematically analyzes the impact of fiscal and tax incentive policies on my country's carbon emission reduction through literature research and comparative analysis. The study found that the current fiscal and tax policies for carbon emission reduction have played a positive role in promoting the transformation of a low-carbon economy, improving energy efficiency, and reducing pollution emissions. However, there are still certain deficiencies in the coverage, incentive strength, and enforcement strength of the policy, which affects the overall emission reduction effect. Through the analysis of typical cases at home and abroad, the implementation effects of different fiscal and tax policies are summarized, and improvement

suggestions are put forward. In general, fiscal and tax policies play a key role in my country's carbon emission reduction process and are an important means to achieve the "dual carbon" goal.

7.2. Research Prospects

Although this paper has conducted an in-depth analysis of fiscal and taxation policies for carbon emission reduction, there are still some limitations in the study. First, data limitations and regional differences may affect the universality of the conclusions; second, the interaction between fiscal and taxation policies and other policies has not been fully covered. Future research can further collect and analyze data from more regions and longer time spans to increase the breadth and depth of the research. In addition, it is also possible to explore the synergy between fiscal and taxation policies and industrial policies, technological innovation policies, etc., and propose a more comprehensive carbon emission reduction policy plan. Through continuous research and exploration, more scientific and effective policy support can be provided for China to achieve its "dual carbon" goals.

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