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International Experience in the Design of China's Carbon Tax System

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Abstract

Since the beginning of the 21st century, developing a low-carbon economy and reducing greenhouse gas emissions have become the consensus of the international community. The modern tax system is a green tax system. In theory, levying a carbon tax has the intrinsic value of internalizing the external cost of carbon emissions, releasing the *double dividend* of environmental taxation, and supplying internal value of global public goods for addressing climate change. It is of strategic significance to achieve peak carbon dioxide emissions and carbon neutrality, promote high-quality development, build an ecological civilization, ensure the sustainable development of the Chinese nation, and build a community with a shared future for mankind. Some western developed countries have established relatively complete carbon tax systems and accumulated many useful experiences in this regard. Based on the various practices of carbon tax collection in foreign countries, this paper proposes system design suggestions for the introduction of carbon tax in our country from four aspects: tax model, tax scope, tax rate and tax preference, and revenue-neutral recycling.

Keywords: carbon tax, carbon neutrality, modern tax system

1. Introduction

In March 2021, the 14th Five-Year Plan for National Economic and Social Development of the People's Republic of China and the Outline of the Vision for 2035, adopted at the Fourth Session of the Thirteenth National People's Congress, clearly stated that improve the modern tax system. Improving the modern tax system as the theme of the *14th Five-Year Plan* period and future tax system reform is to match the modern country, modern government, modern society, and modern market economy. Based on the principles of democracy, rule of law, fairness and efficiency, it will help the country's economy and politics, cultural, social, ecological comprehensive development, the people's well-being to enhance the tax system (Li, J. J., Feng, L. M., & Rao, Y., 2021). The modern tax system has functional attributes and goal orientation. The construction of a green tax system through taxation to promote energy conservation and emission reduction, and green and low-carbon development has become an important feature of the modern tax system. The modern tax system is a green tax system in a certain sense. Further greening the tax system, improving and developing our country's Green Taxation, promoting green development with taxation, and achieving the dual-carbon goal have become the realistic needs and applications for our country to improve the modern tax system.

On September 22, 2020, General Secretary Xi Jinping announced to the world at the general debate of the 75th United Nations General Assembly that China will strive to achieve peak carbon dioxide emissions by 2030 and strive to achieve carbon neutrality by 2060. In order to implement the 2030 Nationally Determined Contribution Target for addressing climate change, a carbon peaking action plan was formulated to reduce energy consumption and carbon dioxide emissions per unit of GDP by 13.5% and 18% respectively during the *14th Five-Year Plan* period. Taxation is an important policy tool that can be used in achieving the *dual carbon goal*. At present, our country's green tax system includes, on the one hand, taxes levied on pollution emissions, resource development and use, and behaviors that generate pollution, such as environmental protection tax, resource tax, vehicle and vessel use tax, etc.; on the other hand, it also includes consumption tax, corporate income tax, etc. Incentive or punitive tax differences that reflect the policy orientation of environmental protection, energy conservation and emission reduction in other taxes such as value-added tax. At present, it is less than 10 years to achieve peak carbon dioxide emissions before 2030, and only 30 years to achieve carbon neutrality. The task of achieving the dual carbon goal is arduous and the time is urgent. It is difficult to achieve the dual carbon goal only by relying on China's current tax system. Carbon taxes are a kind of pollution tax levied on carbon dioxide emissions. It mainly increases the cost of high-carbon fuels by levying taxes on the

fossil fuels (coal, gasoline, oil, natural gas, etc.) burned and used in production and life according to their carbon content, to reduce the use of fossil energy and carbon dioxide emissions. As a simple and effective carbon reduction policy tool with little negative economic impact, carbon tax has been generally recognized by the international community, so it has been promoted in many European countries and achieved good results (Fan, Y. Q., & Wang, W. J., 2012). In this context, it is of great practical value to investigate the carbon tax collection that has been adopted by many countries in the world.

2. Carbon Tax Collection Practices in Developed Countries

2.1 Finland

As the first European country to implement carbon tax in the world, Finland's carbon tax policy has gone through different stages of development since its implementation in 1990. In 1990, Finland introduced a carbon tax as a separate component of the tax on fossil fuels for transport or heating, at a price of USD 30 per metric ton of carbon dioxide on gasoline, diesel, light and heavy fuel oil, coal and natural gas; in 1995, the levy was levied at a 2:3 ratio of energy tax and carbon tax; In 1997, it reverted to a pure carbon tax base; in 2010, carbon tax, energy tax and energy content tax were levied as energy consumption tax subheads; in 2011, energy-producing wood and other Biomass is levied separately and no longer applies to carbon tax (Khastar, M., Aslani, A., & Nejati, M., 2020).

2.2 Sweden

Sweden is a country with low carbon reserves and high taxation. As a policy to reduce the national tax burden and adjust the tax structure, carbon tax has received less political resistance. Sweden has taxed gasoline since 1924. In 1991, carbon dioxide was levied as a separate tax at a rate of EUR 27 per ton of carbon dioxide emitted. Like other countries, Sweden's carbon tax rate has increased from an initial average carbon tax rate of EUR 27/tonne of carbon in 1991 to an average carbon tax rate of EUR 115/tonne in 2021 and has undergone several adjustments during this period (Dong, J., & Haung, W. P., 2017). Sweden is a mixed carbon tax system. While the carbon tax is levied according to the carbon content of energy, coal, gasoline, and light fuel oil are levied at the rates of 57.39 euros/ton, 0.5 euros/liter, and 0.38 euros/liter respectively. On the other hand, in order to encourage the development and utilization of low-carbon technologies and new energies, Sweden provides a tax-free policy for renewable energy (Li, J. J., & Liu, Z. T., 2021).

2.3 Japan

As the world's fifth largest CO2 emitter, Japan is also facing enormous pressure to protect the environment. Japan's carbon tax can be traced back to the oil and coal tax in 1978. Until 2007, carbon dioxide was levied as an environmental tax at 2,400 yen per ton of carbon. In 2011, the carbon tax base was changed to carbon dioxide emissions, and the tax rate was adjusted to 289 yen per ton of carbon dioxide emissions; in 2012, Japan named the carbon tax as a global warming countermeasure tax, and the tax rate was also increased to 655 yen per ton of carbon dioxide emissions (Deng, W. D., & Deng, Z. X., 2021). Japan's carbon tax policy follows the principle of *wide scope, low tax rate, wide reduction and exemption*, and the taxation scope covers private households and industrial enterprises. At the same time, in order to ensure the smooth implementation of the carbon tax policy, Japan has also formulated relatively complete carbon tax supporting measures and tax reduction and exemption policies.

2.4 France

The carbon tax of French is mainly levied on fossil fuels such as gasoline and diesel. In 2010, France proposed the *Draft Fiscal Regulations*, and in 2014, the carbon tax was officially included as part of the energy tax, levied at a rate of 7 euros per ton of carbon dioxide emissions, and a tax credit policy for personal income tax was provided. In 2015, the Energy Transition for Green Growth Act was introduced, which will return carbon tax revenue through a series of measures. Since 2019, France has imposed a carbon tax of 44.6 euros per ton of carbon dioxide emissions.

3. Characteristic of International Practice

3.1 Tax Objects and Tax Rates

In the early stage of carbon tax collection in developed countries, in order to avoid increasing the burden on enterprises and households due to the carbon tax, and to reduce the resistance to the implementation of carbon tax, most of them adopted the strategy of low tax rate and wide tax base. The carbon tax rate is initially set at a low level and is gradually increased in a progressive and differentiated way. This approach not only fully considers the affordability and adaptability of taxpayers, reduces the resistance to the implementation of the

carbon tax, but also helps Taxpayers gradually establish the concept of emission reduction and improve their behavior patterns. And adopt differentiated tax rates to reduce the burden on enterprises and reduce the negative impact on their international competitiveness while promoting enterprises to reduce carbon emissions.

3.2 Improve Tax Incentives

While implementing carbon tax policies, countries have formulated carbon tax reductions and exemptions to reduce the loss of competitiveness brought to their energy-intensive enterprises, protect the interests of low-income residents, and use them in combination with other emission reduction policies. Carbon tax reductions and preferential policies vary from country to country, but they all reflect the differences between enterprises and residents, industries and regions, and are mainly reflected in carbon tax incentives and reductions for energy-intensive enterprises, important industries, and households superior.

3.3 Revenue-Neutral Recycling

Most countries follow the principle of tax neutrality when implementing carbon tax policies, that is, they do not aim to increase fiscal revenue, but return carbon tax revenue to enterprises in the form of subsidies and compensation for low-carbon technology development, or for energy conservation and environmental protection in order to realize the *double dividend* of the carbon tax policy.

4. Suggestions on the Institutional Design of Carbon Tax in China

4.1 Tax Model

In the collection of carbon tax, setting up an independent carbon tax and integrating carbon tax into other taxes are the two main modes. The carbon dioxide emission reduction orientation of the independent tax model is more prominent, which can send a more direct carbon reduction signal to taxpayers and the outside world. Based on the great urgency of achieving the *dual carbon goal* and the importance of carbon tax collection to the achievement of the goal, it is a feasible choice for our country to adopt an independent tax model for carbon tax.

4.2 Scope of Taxation

In theory, the carbon emissions from the production and operation of enterprises or units, as well as from personal or family life, all belong to the scope of carbon tax collection. In practice, considering the regressive nature of carbon tax, the cost and operability of direct taxation of individuals or households, the collection of carbon tax can mainly be paid by enterprises, institutions and other producers and operators that directly emit carbon dioxide to the environment. At the same time, because road transportation oil consumption accounts for about half of global oil consumption, vehicle use is an important source of carbon emissions. Therefore, carbon emissions from vehicle fuel use, including business vehicles and family vehicles, should be included in carbon tax collection. In the specific operation, it can be collected and paid by oil sellers in the gasoline and diesel sales links. In doing so, while taxing road transportation, an important source of carbon emissions, the carbon tax will be extended to the household sector to guide individuals in low-carbon travel and low-carbon life.

4.3 Tax Rates and Tax Incentives

In practice, it is impossible for the carbon tax rate or unit tax to be levied in one step in accordance with external social costs. The implementation of carbon tax should follow the principle of gradual and phased advancement and establish corresponding dynamic adjustment mechanisms and preferential measures for subsidies. In the early stage of carbon tax collection, a relatively low tax rate can be set to enhance the social acceptability of the tax and reduce the unintended impact on the economy and society; after that adjustment can be taken according to the carbon emission reduction target and the carbon reduction effect of the carbon tax. According to estimates, the social cost of carbon dioxide emissions in China is US$24/ton, while those in the United States and India are US$48/ton and US$87/ton respectively (Ricke, K., Drouet, L., Caldeira, K., et al., 2018).

4.4 Revenue-Neutral Recycling

The tax neutrality principle of carbon tax is an important guarantee for the emission reduction effect of the carbon tax system. On the one hand, return carbon tax revenue to taxpayers in a reasonable and constructive way to reduce the additional burden on relevant stakeholders caused by carbon tax collection; on the other hand, use carbon tax revenue to offset other related repetitive tax projects, to avoid unnecessary distortions of the tax system. The two methods can be combined for increased flexibility and applicability.

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