Research on China's Green Tax System Based on Environmental Protection Tax

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Abstract. China's current green tax system is primarily composed of the Environmental Protection Tax (EPT) implemented in 2018, along with consumption tax, resource tax, vehicle purchase tax, and vessel tonnage tax. However, a comprehensive green tax system has yet to be established, and reforms are urgently needed. The EPT faces issues such as a narrow scope of taxation and low tax rates, while other green tax components like consumption tax, resource tax, and vehicle purchase tax also exhibit deficiencies. This paper recommends expanding the coverage of the EPT, raising tax rates, and reforming other green tax instruments.

Keywords: Environmental Protection Tax; Green Taxation; Green Transition

1 Introduction

Since the reform and opening-up, China's economy has flourished, but this growth has been accompanied by pollution and resource depletion. The 19th National Congress of the Communist Party of China emphasized the need to "promote green development and establish an economic system featuring green, low-carbon, and circular development." Currently, China is accelerating fiscal and tax system reforms, with green tax reform being a critical component. For instance, the implementation of the *Environmental Protection Tax Law* in 2018 marked a significant step toward building a green tax framework. However, establishing a robust green tax system remains a formidable task. Therefore, studying green tax reforms based on China's EPT holds substantial significance.

2 Literature Review

2.1 Current Status and Effectiveness of China's Green Tax System

The Research Group of Jiangxi Provincial Tax Service, State Taxation Administration (2024) argued that China has initially established a green tax system with the environmental protection tax as the main body, supplemented by auxiliary taxes such as resource tax and consumption tax, and supported by preferential policies in value-added

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tax (VAT) and corporate income tax. Through the mechanism of "pay more for more emissions, less for less emissions, and nothing for no emissions," the environmental protection tax has driven enterprises to reduce pollutant discharges. From 2018 to 2022, the pollution equivalent per 10,000 yuan of GDP dropped by 36.2%, and carbon dioxide emissions fell by 14.1%, demonstrating significant green effects. [1] Ma Caichen and Zhao Di (2020) pointed out that the *Environmental Protection Tax Law* implemented in 2018 is China's first single tax law specifically embodying the green tax system. It achieved the "fee-to-tax transition" from pollution fees to environmental taxes, enhancing the rigidity of tax enforcement. [3]

2.2 Practices and Outcomes of China's Environmental Protection Tax

Ma Caichen and Zhao Di (2020) noted that China's Environmental Protection Tax was transformed from pollution fees through a "shift of equivalent burden," legally addressing issues such as inconsistent standards and insufficient enforcement rigidity in the original pollution fee system. By increasing the cost of pollution, the tax forces enterprises to reduce emissions and control pollution, driving the optimization of industrial structures.[3] Liu Hu (2024) proposed that its implementation has reduced pollutant emissions and promoted enterprises to control pollution and reduce emissions. [4] Meanwhile, Miao Shuqi (2024) argued that tax incentive policies encourage enterprises to engage in technological innovation and promote the development of a circular economy. [5] Wang Ye and others (2024) believe that China's environmental protection tax on solid waste has promoted industrial pollution reduction and carbon reduction. [7]

2.3 Challenges in the Current Green Tax System

As the core tax, the environmental protection tax faces issues of a narrow base, excluding pollutants like carbon dioxide and volatile organic compounds, with generally low rates. Zhang Yuan (2019) noted its simplistic incentive design—only two emission reduction tiers without industry differentiation—leading to weak incentives for SMEs, high collection costs, interdepartmental coordination challenges, and administrative hurdles due to outdated monitoring tech. [9] Li Xuhong & Duan Xiaolong (2024) pointed out resource taxes cover only minerals/salt, omitting carbon sinks like forests/grasslands, while fossil fuels like coal have lower rates than natural gas, failing to guide energy transition. Consumption taxes also lack coverage of high-pollution items (single-use plastics, pesticides), limiting their role in shaping consumer behavior. [2] Chen Kai (2024) highlighted that VAT incentives are concentrated in niche areas like wind power, insufficient for solar/hydrogen, while corporate tax incentives have high thresholds, excluding many SMEs and narrowing policy reach. [6] Using an entropy-weighted TOPSIS model, Liu Mingyue and Chai Zhihui (2024) found significant regional disparities in Henan's green tax efficiency, with marginal areas showing low net yields and lagging digital tax management (tax collection informatization) [10] Liu Di (2024) noted China's green tax ratio (4.20% in 2020) and burden rate (0.85%) trail OECD averages (4.56%, 1.35%), with limited coverage—e.g., only 4 pollutant types vs. US/Netherlands including light pollution/e-waste [8].

3 Impact Analysis of the Environmental Protection Tax

3.1 Economic Effects

(1) Price Effect: The EPT has a certain impact on the prices faced by producers and consumers. If the price elasticity of demand is less than 1, consumers will bear a higher portion of the tax, while producers will bear a lower portion. If the price elasticity of demand is greater than 1, producers will bear a higher portion of the tax, and consumers will bear a lower portion. When the price elasticity of demand is exactly 1, the tax burden is split equally between consumers and producers.

(2) Output Effect: By raising pollution costs, the EPT reduces production scale and incentivizes eco-friendly practices, optimizing resource allocation. The EPT refers to a tax imposed by the government on polluters to reduce pollution activities and products, decrease pollutant emissions, lower production capacity, and reduce the quantity and scale of products. By levying an environmental protection tax, the government effectively utilizes pricing mechanisms, encouraging producers to reduce production, limit the emissions of environmental pollutants, and curb the misuse of resources. This enables producers to proactively implement measures to minimize environmental damage, reduce pollutant emissions, and effectively optimize resource allocation. Therefore, through the imposition of the environmental protection tax, producers can prioritize environmental protection, adjust their business strategies, and develop in an environmentally friendly manner, thereby achieving sustainable economic, environmental, and social development.

(3) Substitution Effect: First, government taxation on polluting activities and products alters production costs, affecting firms' revenues and costs. Rational economic entities, driven by profit maximization, adjust their decisions to replace low-margin activities/products with higher-margin ones. Thus, when an environmental protection tax is imposed, businesses may adjust taxable goods production to minimize tax burdens, while the government uses tax revenue to address environmental costs. Second, when firms shift tax burdens to consumers, the latter reduce consumption of taxable goods and increase purchases of non-taxed alternatives, driving substitution. Through this substitution effect, the tax incentivizes consumers to choose cleaner, greener products over polluting ones, shaping consumption behavior and advancing the tax's environmental goals.

3.2 Social Effects

(1) Redistribution Effect: The imposition of the EPT inevitably generates certain side effects, including rising product prices, declines in real wages, reduced returns on capital, and greater inequality in income distribution. According to data from the Organisation for Economic Co-operation and Development (OECD), the tax burden resulting from environmental and energy-related regulatory measures predominantly falls on low-income households. This is because low-income individuals spend a larger proportion of their income on domestic energy and transportation fuels compared to high-income groups, leading to a mildly regressive impact on income distribution.

(2) Welfare Effect: The regulatory role of the Environmental Protection Tax in social welfare is mainly manifested in expanding the autonomy of local governments in tax collection. According to the tax law, local people's governments have the right to apply tax standards to taxable air pollutants and water pollutants within prescribed limits. This demonstrates that the design concept of the Environmental Protection Tax embodies the idea of "social redistribution"—that is, through differential taxation to regulate the pollution costs of different regions, it seeks to balance the development levels and capacities across regions.

4 Deficiencies in China's Green Tax System

4.1 Environmental Protection Tax

The current EPT exhibits certain limitations that undermine its effectiveness as a green tax instrument. First, the scope of taxation remains narrow. For instance, carbon dioxide (CO_2) has not yet been included in the taxable category of air pollutants under China's EPT framework. While CO_2 plays a role in promoting plant photosynthesis, it is also a major environmental pollutant. Excessive CO_2 emissions contribute to global warming and climate change. Notably, China's persistent haze issues are linked to high CO_2 emissions, yet the existing Environmental Protection Tax Law does not impose levies on CO_2. Furthermore, the EPT should not only target environmentally harmful substances but also tax pollution-generating behaviors and energy-intensive products.
Second, the tax rates are relatively low. To alleviate the tax burden on enterprises following tax reforms, China's current EPT rates largely mirror the previous pollution discharge fee standards. However, these low rates often result in corporate tax liabilities being significantly lower than the actual costs of pollution control and emission reduction. For example, the tax levied on sulfur dioxide (SO_2) ranges from 1.2 to 12 RMB per pollution equivalent (0.95 kg), far below the desulfurization costs incurred by enterprises. Consequently, companies may lack sufficient incentives to adopt energy-saving and emission-reduction measures.

4.2 Consumption Tax

China's current consumption tax system lacks sufficient regulatory power to promote environmental sustainability. First, the scope of taxation remains relatively limited. For example, plastic products contributing to "white pollution," toxic goods emitting large volumes of carbon dioxide (CO_2) and sulfur dioxide (SO_2), and ozone-depleting consumer goods are still excluded from the tax base. Furthermore, the "green" function of the consumption tax should not be confined solely to tangible products. Given the diversification of economic activities, certain service industries and labor-intensive products can also harm ecological and social environments. Examples include excessive electricity consumption by entertainment venues like KTVs and overdevelopment of natural ecosystems in tourist destinations.

Second, the low tax rates for certain items constrain the consumption tax's environmental efficacy. For instance, the 5% tax rate on batteries translates to a tax burden of less than 1 RMB per battery. Even if producers pass this cost to consumers, the financial impact on consumers is negligible, making it difficult to deter consumption effectively.

4.3 Resource Tax

Regarding the resource tax, the current scope of taxation remains narrow. During the reform of the resource tax system, the Resource Tax Law only expanded coverage to water resources, compared to previous regulations. Initially, Hebei Province was designated as a pilot region for water resource tax reform, later extending the pilot to nine provinces, including Beijing, Shanxi, Shandong, Henan, Sichuan, Shaanxi, Ningxia, Tianjin, and Inner Mongolia. However, progress in expanding the pilot has been slow, and to date, no further provinces—particularly those facing severe water scarcity—have been included. While the water resource tax has entered the pilot phase, the existing resource tax primarily targets the extraction and use of minerals and salt, which are characterized by significant differential rents, wide distribution, and ease of administration. Notably, "green" resources critical to ecological conservation—such as forests and grasslands—remain excluded from the tax base. Although these resources are renewable, their long growth cycles and vital role in environmental greening necessitate their inclusion in the tax scope for enhanced protection.

5 Recommendations for Improving the Green Tax System

5.1 Expand the EPT

To progressively expand the scope of the EPT, measures such as introducing a carbon tax and waste tax should be implemented, extending coverage to energy-intensive products and activities that cause environmental pollution and ecosystem damage. Specifically, carbon taxes should be levied based on the emission volumes of pollutants such as CO_2, incentivizing enterprises to adopt low-carbon innovation technologies and reduce greenhouse gas emissions.

Additionally, China faces a pressing societal challenge: improper waste disposal methods (e.g., landfilling and incineration) not only result in secondary pollution but also squander valuable resources. To address this, a weight-based waste tax could be introduced, imposing differentiated tax rates on distinct waste categories, including recyclable waste, incinerable waste, hazardous waste, dangerous waste, and compostable waste. The revenue generated from these taxes should be allocated to developing waste sorting and treatment technologies, reducing pollution at the source, and funding subsequent waste management processes.

5.2 Reform Consumption Tax

To enhance the environmental focus of the consumption tax, it is imperative to broaden its scope. First, levy consumption taxes on high-pollution products such as plastic items contributing to "white pollution," toxic goods emitting significant carbon dioxide (CO_2) and sulfur dioxide (SO_2), highly polluting electronics, phosphorus-containing detergents, and chemically treated agricultural films. Second, selectively impose consumption taxes on entertainment venues like KTVs to advance energy conservation and emission reduction goals. Additionally, the tax rates for specific items should be raised. For instance, increasing the consumption tax rate on batteries, solid wood flooring, and disposable wooden chopsticks to 8% would strengthen the tax's regulatory impact.

5.3 Broaden Resource Tax

To address the narrow scope of the resource tax, it is recommended to further expand its coverage by incorporating the use of non-renewable resources and resources with severely impaired regenerative capacity, such as forests, grasslands, and tidal flats. The tax base should be determined based on the area of reclaimed forests, grasslands, wetlands, and tidal flats, thereby extending the resource tax to more natural ecological zones. Concurrently, regarding the ongoing reform of the water resource tax, pilot programs should be expanded based on existing experience to increase sample diversity and actively advance the reform process.

6 Conclusion

Environmental issues profoundly impact the sustainable development of China's economy and ecosystems, as well as the enhancement of public well-being. Against the backdrop of the government's recognition of environmental protection as a priority and its efforts to advance green taxation, the Environmental Protection Tax (EPT) represents a critical policy measure implemented under China's market economy framework. It holds significant practical value for advancing the construction of a "resource-saving and environmentally friendly society" (the "Two-Oriented Society"). Establishing a sound green tax system is a long-term and challenging endeavor. Given China's current economic context and policy direction, it is essential to explore a green tax framework tailored to China's national conditions, while leveraging environmental governance theories and practical experiences from developed countries.

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