

An analysis of the regional economic effects of carbon tax in China: based on the production-based and consumption-based emissions

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Abstract: As one of the most cost-effective means of reducing emissions, carbon tax has long been supported by most economists and scholars. Based on the 2007 multi-regional input-output table, this paper discusses the impact of carbon tax on the China's eight regional economy and the short-term competitiveness of industrial sectors from the two accounting principles of production-based emissions and consumption-based emissions. Meanwhile, in order to maintain the principle of tax neutrality, carbon tax revenues are used to reduce the production tax and a lump-sum transfer to household, respectively. We found that, if the carbon tax revenues are used to reduce the production tax, the economically developed regions such as Beijing-Tianjin, Eastern Coastal and the Southern Coastal are the net beneficiaries of the carbon tax policy, while the Central, Northwest and Southwest the more economically backward areas are need to bear the additional carbon tax burden. However, if the carbon tax revenues are used as a lump-sum transfer to household, this result is just the opposite. Moreover, under different emissions accounting principles, the impact of carbon tax on sectors competitiveness are quite different in various regions. Specifically, the potential effects of carbon tax on each sector in Beijing-Tianjin, Northern Coastal, Eastern Coastal and Southern Coastal are greater under the consumption-based principle than under the production-based principles. In contrast, the sectors in Northeast, Central, Northwest and Southwest are more influenced by carbon tax under the production-based emissions than under the consumption-based emissions. Therefore, in formulating the carbon tax policy, how to define the carbon emission responsibilities of each region and how to use the tax revenues will have a great impact on the implementation effect of the policy. At the same time, policy-makers should also pay attention to the impact of carbon tax on the balanced development of regional economy while achieving carbon emission reduction.

Keywords: Carbon emissions; Accounting principles; Multi-regional input-output analysis; China