Literature Review and Policy Analysis of Carbon Tax

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Abstract: This paper is based on the carbon tax policy as the main research content with the literature review of the previous studies and the new research methods. The paper hopes to be able to out of the shackles of the past, and study the carbon tax policy to fill the gaps in research from the perspective of policy analysis. In this study, we need to put forward a "China's carbon tax policy and sustainable development" analysis framework. This framework mainly consists of three parts: one is the analysis of China's carbon tax policy choice model, namely the influence factors of China's carbon tax policy; another one is the influence model of China's carbon tax policy on economic and social influence and effect; the last one is the standard model of China's carbon tax policy which is how to do in order to achieve the goal of China's carbon tax policy and sustainable development.

Introduction

Elinor Ostrom opens with "almost every week there is a big news about the destruction of precious natural resources" in the book "governing the common.". China's rapid economic development brings the high cost of environmental damage. In recent years, government departments and academic circles have begun to pay more attention to such problems.

Sustainable development and rapid economic growth pace is an ideal choice for the present stage of China's development road, the increasingly serious environmental problems and energy shortage need China to re-examine current rapid economic growth. We should find ways so as to ensure the moderate economic growth and to keep the rational use of energy resources and sustainable development.

The main content of this paper is China's carbon tax policy according to the domestic and foreign research content, and establish new research methods. The goal of this paper is to hope that the specific framework of China's carbon tax policy research can be given through the policy analysis in order to make some suggestions for the realization of China’s low carbon targets.

Literature Review on Carbon Tax

For the study of carbon tax, domestic and foreign scholars have given some attention, and the actual study of carbon tax policy in various countries began to emerge. According to the World Bank estimates, the annual adaptive costs will reach 100-400 billion (World Bank, 2006).

Carbon tax, in fact, is a tax on carbon dioxide produced by burning fossil fuels, which can reduce the use of fossil fuels and thus lead to the use of alternative fuels. It is a method of reducing the cost of carbon dioxide emission reduction. (Nordhaus, 2007). From the perspective of welfare economics, the global climate is a public product. The theoretical basis of the global climate problem caused by carbon dioxide emissions is the external diseconomy (Jinnan Wang, 2008).

According to the study of domestic and foreign scholars on carbon tax research content, it can be divided into the following aspects:
From the Theoretical and Empirical Point

Gu Liubao thinks carbon tax can increase the cost of doing business in the short term (2015), but in the long term can improve the production efficiency of enterprises. Wang Shufang (2005) conducted a comprehensive summary, from the domestic and foreign carbon tax policy, and embraced the impact of energy conservation and emission reduction in-depth review. Yuan song Zhao Kai (2013) thinks that carbon tax can lead to a low-carbon consumption structure. Not only that, for China's current industrial structure, carbon tax levy can optimize the secondary industry, stimulate the development of the tertiary industry. Chen Hongmin (2012) from the point of view of the game analyzes carbon tax development prospects, gets the conclusion which is avoiding "carbon leakage risk", according to our country actual situation, in order to design a carbon tax system in line with China's national conditions. Jiang Zhen (2012) from the development of low carbon economy and the development of a carbon tax, puts forward China's current tax system in the carbon tax, proposes the implementation of China's carbon tax benefits, and he puts forward the management system in the design of the carbon tax system needs to pay attention to, at the same time the carbon tax revenues of local taxes should be given, which can prevent the collusion of the local government and enterprises. This is different from the previous central-local tax sharing.

From Local Practice

Johansson Bengt proposed Sweden's carbon tax system is from 1991, as a supplementary energy tax levy. Now, the carbon tax is conducive to the use of Swedish bio-combustion heat. At present, 50% of the energy comes from thermal energy. In addition, Japan Ministry of environmental protection discusses carbon tax are introduced in detail, including the application background, the mechanism, tax issues and other support policies. Among them, the carbon tax for 2012 reached 39 billion 100 million yen, then there will be 262 billion in 2016. At the same time, these taxes and fees will be used to control the emission of carbon dioxide, such as the development and application of new energy and so on. Zimmer Michael argues that carbon taxes are more effective than carbon emissions trading. Jonathan L. Ramseur and Larry Parker (2009) from the three aspects of the carbon tax advantages, disadvantages and execution analyzed this tax, including the use of levy tax object, tax rate and tax. Jonathan L. Ramseur and Jane A. Leggett (2012) enrich the previous studies in the follow-up study, think carbon tax policy should include the following aspects: appropriate, is to get the ability of certain taxes; efficiency, is to increase the economic efficiency of production; fairness; maneuverability; political feasibility. Adele C. Morris emphasizes the American consciousness of great powers, and should be a dialogue with other countries, which include administrative management and technology in terms of carbon pricing to help other countries in the formulation of a carbon tax policy. Gilbert Metcalf and David Weisbach (2009) that a carbon tax is better than a carbon emissions trading right. The results show that good carbon tax can contain 80% of America's carbon dioxide emissions, and cover 90% of the medium for extra income.

Zhang Xiaoying, Zhong Jinwen (2010) believes that in the process of China's carbon tax levy we should pay attention to the determination of the carbon tax rate, to the choice of the timing of the introduction, to focus on the setting of the tax exemption regulations and the formation of the policy. Wang Min, Wang Jun (2011) proposed deeply the object should is the user of fossil fuel companies and consumers, at the same time maximize the reflects the reduction of the marginal cost for the energy intensive industries and low income groups to give preferential policies according to the fossil fuel carbon content. Cheng Yushi (2012) believes that the establishment of China's carbon tax system involves many aspects of resistance: the resistance of the reform of the relevant economic sector, China's central and western regions and the constraints of science and technology. Yang Mengzhu (2014) thinks that China's carbon tax should be embedded and not suitable to become independent tax. Yang Mengzhu (2014) believes that the implementation of China's carbon tax is too early, and it needs many up porting measures. Wang Wenge (2012) believes that China's energy conservation and emission reduction should be the main goal of carbon tax design using different energy classification management, but also need to co-ordinate other means to achieve the goal.
Deng Wenjuan (2012) argues that the attribution of the carbon tax should be given to the central and local governments according to 7:3 and also pay attention to prevent carbon tax in China to be a "quasi tax", and administrative means. Su Ming (2009) thinks that tax is suitable for the quantitative of tax in the short term carbon, he proposed to need different tariff and differential tax rate.

Xue Yanhua (2013) gives the introduction of Australia's carbon tax bill "clean energy act", makes reference from the tax levy object, range, price standards in order to the establish China's carbon tax. Zhang Wei, Zhu Lei (2011) put forward the carbon tax levied, the tax rate comparison, revenue cycle, ex-post evaluation and tax relief of Nordic countries, and think that China's carbon tax should be with local characteristics, rather than a direct copy. Deng Rui (2013) according to the practice of foreign carbon tax system puts forward to not only the main and auxiliary combination in the carbon tax, but also improving the carbon tax to the legislative level. Yang Yang, Du Jian (2010)according to the enlightenment of EU countries and China get the conclusion that a carbon tax need to grasp the opportunity to advance steadily and flexibly, and to reflect the differences in tax rates, and to get a reasonable choice of the collection of links considering the overall solution of other supporting . Wang Chun (2010) gives the carbon tax policy points to inner system itself, outer supporting system and the supervision and evaluation system, and the supervision and evaluation system need regional organizations, national environmental departments and industry enterprises.


From the Comparison between Carbon Emission Trading Rights

Shen Chen (2012) makes the contrast between he carbon tax and carbon emissions trading system from the theoretical basis and practical effects. The carbon emissions trading is likely to lead to monopoly but to control carbon quotas; and carbon tax has convenient operation but is not easy to control quotas. Qiu Lei (2013) makes a comparative study between carbon tax and carbon emissions trading. Huang Haiyan (2012) believes that we need to accelerate the joint use of carbon trading and carbon tax, with the case of the introduction of Australia, and to explore the way out of china. Kuang Dan (2014) builds a carbon tax and carbon emissions trading CGE model to analyze these two systems.

From Comparison with Other Systems

Li Nuyun, Lu Ji (2012) makes comparison between forestry carbon sinks and carbon tax system, and makes the enterprises should speak of forestry carbon sequestration before placing the carbon tax, which funded afforestation to obtain much more carbon credit metrics, and gives relief considerable carbon tax. Wu Rengerile (2011) analysis the effect of the carbon tax for public welfare, thinks that the government should strengthen supervision to prevent the shifting of burden, should also establish a compensation mechanism for the public and reduce the corporate tax.

From Legislation

Xiong Bin (2011) believes that China's carbon tax legislation in China has the feasibility, and the carbon tax legislation is the need to transform the economic development model in order to improve the environment and the tax system. Sun Ruirui (2012) believes that China's carbon tax is nominal, and the essence of China's carbon tax is a pollution tax, is an indirect tax, is a kind of specific purpose of regulation tax. Wang Chi, Fan Cenyao (2010) believes that the need to establish a fair and reasonable low carbon economy on the basis of the establishment of the basic rights of citizens of carbon emissions.

To sum up, domestic and foreign research for a carbon tax is divided into some of it. The summary for the study of carbon tax is not very comprehensive, and even structural is not very clear. The paper is in the hope to be out of the shackles of previous studies as carbon tax policy to be the main research contents from policy analysis point of view.
New Research Methods: Policy Analysis

Unlike previous foreign experience introduction and the contents of the specific policies, this is a new study angle of view to discuss this problem trying to construct the analysis framework of a carbon tax policy and sustainable development, and to describe the status quo of China's carbon tax policy system, evaluate the effect of a carbon tax policy, analysis of China's carbon tax policy system in the presence of obstacles. It discusses design principle and basic logic, and puts forward policy suggestions to improve the system of carbon tax policy in China with the help of the experience of carbon tax policy system in western countries.

The paper hopes to be able to out of the shackles of the past, and study the carbon tax policy to fill the gaps in research from the perspective of policy analysis . In this study, we need to put forward a "China's carbon tax policy and sustainable development" analysis framework. This framework mainly consists of three parts: one is the analysis of China's carbon tax policy choice model, namely the influence factors of China's carbon tax policy; another one is the influence model of China's carbon tax policy on economic and social influence and effect; the last one is the standard model of China's carbon tax policy which is how to do in order to achieve the goal of China's carbon tax policy and sustainable development.

The study will follow Herbert Alexander Simon on the distinction between "empirical research and normative research", James Buchanan's "under the rules and rules of selection", Elinor Ostrom’s institutional analysis and development (IAD) framework, combined with the policy process theory and policy analysis method, attempts to put forward a Chinese carbon tax policy and environmental sustainable development framework in order to explore the selection model of Chinese carbon tax policy (Figure 1),influence of carbon tax policy model (Figure 2) and the carbon tax policy specification model (Figure 3), selection model and influence model is the empirical orientation, while the standard model is the ethical orientation which still needs to verify the influence model.

Figure1 constructs the model for the selection of a China's carbon tax policy according to the framework of institutional analysis and development (IAD),and its core is to explore the logic behind the carbon tax policy selection, namely what factors will push carbon tax policy on the agenda. The core idea is the carbon tax policy is a product of the interaction between different actors under certain decision-making scenarios, there are many factors will influence the results of policy choice, including both internal variables (actors in the determination of policy scenarios ), including external variables (community value, decision rules, economic level and the international diffusion, etc.)

![Figure 1. The selection model of Chinese carbon tax policy.](image-url)
Once the carbon tax policy has been introduced, playing an effective role will become a key issue, which needs to be assessed. Policy evaluation has become a special subject, and the more stringent policy assessment science needs to use the experimental or quasi experimental research design to assess the impact of policy on the target population. In short, we need to use a more scientific approach to assess the impact of policies on the social economy. Figure 2 using logic model to evaluate the impact of carbon tax policy which embrace several links, including its input, activity, results and impact. So policy impact assessment is find the net effect, which is convenient for further policy options to provide policy recommendations. When a carbon tax policy cannot achieve the desired effect, we need to find out the reason which is the failure of the theory (carbon tax policy itself is not scientific), or the implementation of failure (carbon tax policy is difficult to be well implemented)?

![Figure 2. The influence of carbon tax policy model.](image)

The last one of "China's carbon tax policy and sustainable development" analysis framework needs to answer such a question: if we want to realize the sustainable development and what kind of carbon tax policy system do we need? How can we advance this reform? This involves the issue of policy design and reform path, but also the last part of the research report. Normative model needs to consider the policy issues, policy knowledge, policy environment and policy objectives and other aspects of knowledge.

![Figure 3. The carbon tax policy specification model.](image)
Carbon Tax Policy Layer

From the aspect of public policy, the carbon tax policy is product of the interaction between different actors under certain decision-making scenarios, and many factors will influence the results of policy choice, both internal variables (actors in decision situations), including external variables (common value, decision rules, carbon tax status, economic level and international diffusion, etc.). The internal actors in the decision-making scene are the main body of the carbon tax policy implementation. In fact, the external environment is the impact of the external environment of China's carbon tax policy. If China's industrial restructuring, including the first industrial base is not stable, the proportion of the second industry is too large, the third industry development. With awareness of environmental protection is bigger, the introduction of a carbon tax environment of public opinion growth and other national carbon tax policy for China's influence and reference, China's current with the support of energy-saving environmental protection and sustainable development efforts increase to form a good policy environment and so on.

But so far, China still has no carbon tax policy, and it is difficult to make policy judgments, but it can be seen that the carbon tax policy is difficult to implement. Is related to the interests of the relevant economic sectors or the actual situation and the technological gap. The regressive nature of carbon tax will affect the distribution pattern of different income groups. In March this year, the Minister of finance Lou Jiwei made it clear that China will not set up a carbon tax alone. But will be the carbon tax arrangements in the current preparation of the tax, such as environmental taxes or resource tax. But he said that this year the scope of resource tax reform is not involved in the expansion of carbon tax.

At present, from China's actual situation, the carbon tax policy design should obey the following rules: according to the principle of local conditions and the principle of slow promotion. In the formulation of the specific policies of the carbon tax, there are the taxpayer (enterprise, individual), the collection of links (production and consumption), tax rate, preferential, management system and other aspects to discuss. Not only that, but also requires a series of carbon tax related platforms, such as carbon emissions information disclosure and management, carbon emissions related risk accounting.

Therefore, according to the above content, China's carbon tax policy system needs to include three aspects, namely, the inner layer of the policy, policy outer layer, policy guarantee layer. As shown in the following figure:

Reasonable operation of the inner layer of the carbon tax policy needs the policy support at the outer layer, also for a carbon tax policy is in need of supervision and management. In the guarantee policy layer, policy can meet the main goal, whether conforms to the economic level, the legal level and policy level of efficiency, the rule of law and accountability.

Summary

Carbon tax policy avoids achieving a carbon lock and carbon dependence, to help the final realization of the structure of low carbon consumption and optimize the industrial adjustment. Adhere to the carbon tax policy constraints and incentives and be with the carbon emissions trading system. In the establishment of carbon tax policy, it needs to design more than three levels of content, which embrace good interaction with each others.
Figure 4. The layer of carbon tax policy.

References


[20] Deng Wenjuan. The problems we should pay attention to on the design of carbon tax in our country[J]. 2012 (01).


[34] Li Nuyun.Lu Ji. The discuss of the forestry carbon sequestration and carbon tax system design[J].China population, 2012 (22).


