

Collaborative Governance of Environmental Regulation under Carbon Emission Reduction Target

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ABSTRACT

With the worsening of environmental problems, controlling carbon emissions has become an urgent task for all countries in the world. In order to give companies incentives to actively reduce emissions, China has used carbon markets as an important policy tool and launched a national carbon market trading program after years of trials. However, the effective operation of the market is inseparable from the effective coordination of the relationship between the government and the market. Based on the imperfection of the market mechanism, this paper proposes to jointly promote the low-carbon transformation of enterprises through the coordination of administrative environmental regulation and carbon trading market.

KEYWORDS: *environmental regulation; carbon trading; coordination*

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I. INTRODUCTION

Carbon emission reduction is an inevitable choice for all countries to deal with resource and environmental constraints and achieve sustainable development. The Chinese government has been making efforts to reduce carbon emissions, and made a commitment to the international community in 2020 that China will strive to achieve a peak in carbon emissions by 2030 and achieve carbon neutrality by 2060, which demonstrates that China has the courage to shoulder its responsibilities as a major country in global environmental governance. China's economy is led by the secondary industry. The industry is an important sector of carbon emissions, accounting for more than 70% of carbon emissions. Industrial enterprises are the key link and main bottleneck for China's green, low-carbon and circular economic development. To this end, the Chinese government has proposed to continuously promote the adjustment of industrial structure and energy structure and accelerate the establishment of a "dual carbon" policy system. China's environmental policies have always been dominated by administrative mandates. Although

such environmental regulations can constrain enterprises from discharging emissions according to required standards, it is difficult to motivate enterprises to actively reduce emissions. The carbon trading system with market incentive attributes is conducive to enterprises achieving the goal of pursuing economic benefits. Enterprises can save quotas by reducing carbon emissions, so that they can sell quotas in the carbon trading market to gain profits and stimulate their initiative to make technological innovations to reduce carbon emissions. Since 2013, China has piloted carbon trading markets in Beijing, Shanghai, Tianjin and other cities, with a unified national carbon market officially launched in July 2021. The establishment of a carbon market in Chinese industry plays an important role in green transformation, but the establishment and perfection of the market system is dependent on the effective coordination between market and government, this paper argues that simple environmental regulation, there are insufficient for its energy-intensive manufacturing green transformation should

implement administrative environmental regulation and organic integration of carbon trading mechanism, This is of great significance to the smooth transformation of China's manufacturing industry.

II. Theoretical analysis and literature review

The high investment cost of carbon emission reduction (Ren et al., 2021) leads to the decline of corporate financial performance (Brunnermeier and Cohen, 2003), thus enterprises lack the motivation to actively reduce emissions (Chen et al., 2019; Jia Ming et al., 2021), environmental regulation becomes an important mechanism to constrain pollution emissions (Chen et al., 2018). The recognition of the effect of environmental regulation has developed from the original "cost of compliance" hypothesis to the "Porter" hypothesis. Early scholars believe that environmental regulation will bring additional production costs to enterprises, thus affecting enterprise performance. However, more and more studies believe that reasonable environmental regulation policies can enhance enterprise competitiveness and promote economic development by promoting technological progress (Porter and Linde, 1995; Qian Zhengming and Liu Xiaochen, 2014), which is an important measure to promote enterprises to achieve green transformation. Extreme emission reduction measures may trigger carbon transition risks, which will be transmitted to upstream and downstream industries along with the industrial chain (Han Mengyao et al., 2022). Therefore, it is very important to discuss reasonable environmental regulations with incentive and constraint effects for the green transformation of energy-consuming industries (Shen Keting and Gong Jianjian, 2011).

Environmental regulation is mainly divided into administrative regulation and market-oriented regulation represented by carbon trading mechanism (Hu Jun et al., 2020). From the perspective of motivation, the former is derived from administrative power and can form mandatory constraints, which is conducive to overcoming enterprise speculative psychology, but cannot stimulate active environmental management. The latter is based on economic interests and can generate internal proactive incentives (Lopez-Gamero, 2010). Administrative environmental regulation cannot independently for the enterprise green transition to provide a good policy environment (Hai-feng Zhao, etc., 2021), the establishment of a carbon trading market makes enterprises can sell the excess in the market quota, and promote the technological progress to reduce carbon emissions from power, became the various countries' promote carbon emission reduction is an important policy tool.

Existing studies have discussed the institutional design of carbon emission trading system (Fang et al., 2018) and emission reduction path (Bai Xuejie et al., 2021). In addition, a large number of papers have tested the implementation effect of carbon market system, and studies have found that carbon trading mechanism can promote carbon emission reduction (Wang and Zhao, 2019; Zhang et al., 2020), green productivity improvement (Zhu et al., 2019) and higher supply chain performance (Zakeri et al., 2014). Calem et al. (2016) believed that although the main goal of carbon market is to reduce carbon emissions, it also provides incentives for enterprises to make technological changes. Li Zhiguo and Wang Jie (2021) pointed out that carbon emission trading not only promotes carbon emission reduction in pilot areas, but also can influence carbon emissions in neighboring areas through spillover effects of innovation and industrial upgrading. However, some literature conducted classified studies based on the carbon quota system and liquidity of carbon market, and found that the effect of carbon market was restricted by many factors. From the perspective of enterprise value, Shen Hongtao and Huang Nan (2019) found that carbon trading is beneficial to the short-term value improvement of enterprises, but cannot promote the long-term value improvement of enterprises. The reason is that carbon quota allocation in pilot provinces is relatively loose, which leads to the oversupply of quota and fails to realize the incentive effect. Hu Jun et al. (2020) found that carbon trading mechanism promoted the technological progress of enterprises, but the influence of carbon trading mechanism would be weakened when the liquidity of carbon market is low and the cost transfer-ability of enterprises is weak. Song Deyong et al. (2021) found that carbon trading has an incentive effect on enterprise green innovation, but carbon quota allocation method and enterprise heterogeneity will affect the effect of carbon market on green innovation. In short, the current carbon trading system in China is not perfect, with unstable carbon prices and insufficient market activity (LAN Hong and Chen Yahan, 2022).

Some scholars made a comparative analysis of the effects of administrative environmental regulation and carbon trading market, believing that they are two policy tools based on the government and the market respectively, and there will be significant differences in the mechanism, way and effect of their impact on environmental governance. Zeng Qian et al. (2020) found that administrative environmental regulation has a better effect on environmental quality improvement in areas with low industrial structure, while market-oriented environmental regulation has a

better effect on environmental quality improvement in areas with high industrial structure. According to the economic man hypothesis, the goal of enterprises is to pursue the maximization of economic benefits, and the impact of environmental regulations on the cost and income of enterprises will inevitably make enterprises make adjustments in strategy, investment and behavior. Zhao Xiaoli et al. (2015) found that market-oriented environmental regulation has a greater impact on corporate strategy, while administrative environmental regulation has a greater impact on corporate technological progress. Huang Qinghuang and Gao Ming (2016) found that the impact of administrative regulations on energy conservation and emission reduction efficiency presents an inverted U-shape, while market-oriented regulatory tools present a positive U-shape structure. It is because the administrative environment regulation and differences of market-oriented regulation, Wei-hong Wu (2020) put forward, such as in the use of environmental regulation, need to adjust measures to local conditions, use different means to promote enterprise innovation performance improvement, they artificially in technology development, by setting a mandatory emissions standards, intensify administrative punishments, such as administrative regulation means, To overcome the speculative psychology of enterprises, it is not easy to use administrative order control means in the transformation stage of technological achievements. We can stimulate the promotion effect of environmental regulation on the sales rate of new products through market incentive means such as carbon trading. The complementary effects of administrative regulation and market-oriented regulation determine their coexistence for a certain period of time (Tang Weiqi et al., 2016).

III. Analysis on synergistic promotion of enterprise transformation by administrative environmental regulation and carbon trading

From the perspective of economics, enterprises' green transformation and transformation should not only face explicit costs such as equipment and technology upgrading, carbon transaction cost, administrative penalty or litigation risk cost, but also face hidden costs such as emission reduction costs to production expenditure, suppression of non-environmental technological innovation, customer and reputation loss caused by high carbon emissions. Cost-effectiveness is an important factor to consider when enterprises engage in carbon emission reduction activities. The huge investment required by green transformation hinders the enthusiasm of enterprises in emission reduction. In addition, carbon emission

activities have negative externalities and are prone to free-riding, so enterprises lack initiative in carbon emission reduction. From the governance perspective, enterprise activities to reduce emissions, asymmetric information and principal-agent problems carbon reduction activities need to spend a lot of money, increase the enterprise cost, management as the entrusted, in the case of a lack of long-term incentive, more focus on corporate earnings during his tenure, lack of focus on enterprise long-term value, lack of power investment in carbon emissions. Therefore, both the enterprise and the management level lack active incentives for carbon emission reduction activities, whether based on the short-term interests of the enterprise or the short-sighted behavior of the management caused by the imbalance between the residual control right and the residual revenue right.

China has been mainly controlling administrative environment, administrative rules and regulations to issue an executive order means for enterprise has the strong constraints, the enterprise such as not meet minimum standards, will face punishment, so out of compliance goals, enterprises to actively carry on the improvement of technology, but the administrative rules and regulations for enterprises to produce initiative incentives to reduce emissions, Even formalism, flexibility or selective implementation will be generated to meet regulatory requirements, and there is insufficient incentive to achieve carbon peak and carbon neutrality goals. The carbon trading market is an important policy tool to encourage enterprises to actively participate in carbon emission reduction activities by obtaining the income from carbon quota transfer. The idea of carbon emission trading originated from Coase's property rights theory, which was different from Pigou's (1920) proposed to solve environmental pollution by government means such as taxes or subsidies. Coase (1960) believed that the cause of environmental problems was that there were no clear property rights for environmental resources. The generation of pollutant discharge rights can internalize the externality of pollutant discharge through clear property right definition, and encourage enterprises to take the initiative to strengthen environmental governance through improving technology or upgrading industrial structure through market mechanism. However, the defects of market mechanism and the natural profit-seeking of market participants determine the inevitability of administrative environmental regulation. Since carbon emission rights are allocated and confirmed by administrative departments, the process from generation to cancellation of carbon emission rights must be under the supervision of administrative

organs. Therefore, some scholars put forward the theory of strong administrative supervision on carbon emission rights trading (Zhang Hui and Feng Zihang, 2021). However, empirical tests show that too loose or too tight mandatory regulations on carbon emissions will affect enterprises' motivation to participate in carbon trading, that is, moderate administrative regulations are more conducive to providing enterprises with motivation to participate in carbon market (Cui Yiguang et al., 2018). It has been proved by many scholars that moderate environmental regulation can promote technological progress. While carbon market is attracting more and more attention from various countries, the role of administrative regulation should not be ignored, otherwise it will cause market disorder and economic and social disorder.

IV. Research conclusions and policy recommendations

On the whole, on the other hand, represented by carbon trading system can satisfy the carbon emissions of market-oriented regulation of the units of the pursuit of economic interests, encourage the technical innovation initiative, achieve the goal of green transformation, make up for the administrative environment of the policy "one size fits all" and "formalism" and flexible or choose led to government failure. On the other hand, the externality of environmental problems determines the necessity of moderate government regulation. Existing literature has reached a consensus that single environmental regulation is insufficient to promote the green transformation of energy-consuming manufacturing industry, but how to realize the effective coordination between administrative environmental regulation and market-oriented regulation has not been involved. Although the market incentives, such as the carbon market type environmental regulation are playing an increasingly important role, the role of administrative environmental regulation should not be ignored. The government for cultivating and improving market, as well as promoting carbon by administrative controls the establishment of the market mechanism of regulation and punishment mechanism, can play an important role in promoting the healthy development

of the carbon market. In the future, the research of administrative regulation and market mechanism to promote enterprises' low-carbon transformation needs to be further carried out.

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