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On the Operating Mechanism of Carbon Emission Trading Market from the Perspective of Political Economy

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Abstract

Carbon emission trading mechanism is an important measure and tool for global climate governance. China is in the initial stage of establishing a national carbon emission trading market, and its operating mechanism needs to be further developed and improved. Exploring the operating mechanism of carbon emissions trading market from the perspective of political economy, combing the research history of western economics and political economy on carbon trading mechanism, and analyzing the operating mechanism of carbon emissions trading from four angles: the root of global climate problems, the total amount of carbon trading mechanism, quota trading and certified emission reduction, can bring many inspirations to China's carbon emissions trading mechanism.

Keywords

Carbon Emission Trading; Global Climate Issues; Global Climate Governance.

1. Introduction

Since the scholars first observed the increase of the average temperature of the earth in 1950s, the problem of climate change has gradually entered the research field of economics, meteorology and biology. Since 1970s, the remarkable and serious global warming trend and a series of serious economic and social problems caused by it have attracted the attention of researchers in various fields and disciplines all over the world. On April 4th, 2022, the sixth assessment report (AR6) issued by the Intergovernmental Panel on Climate Change (IPCC) of the United Nations, the report of Working Group III, Climate Change 2022: Mitigation of Climate Change, pointed out: "Climate change has caused great damage and increasingly irreversible losses in terrestrial, freshwater, coastal and ocean marine ecosystems, and organisms' often experience' the impacts of climate and non-climate driving factors at the same time. If This means that the global climate problem has become the focus of world attention and needs to be solved urgently[1]. For a long time, the mainstream western economic theory generally believes that the climate problem is caused by the public product attribute of climate. As a public product, the property right of climate is unclear, which leads to negative externalities and market failure. Based on this theory, scholars put forward a variety of market-oriented solutions such as carbon tax, carbon emission trading and carbon financial market. Among them, as the main market-oriented tool to deal with global warming, carbon emission trading mechanism shoulders the important mission of environmental governance, energy conservation and emission reduction, biodiversity protection and sustainable development of mankind[2].

As one of the first countries to join the United Nations Framework Convention on Climate Change, China has implemented many policies and measures to deal with global warming. In 2020, President Xi Jinping promised to the world that "China will increase its national independent contribution, adopt more effective policies and measures, and strive to reach the peak of carbon dioxide emissions by 2030 and achieve carbon neutrality by 2060"[3]. In order

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to achieve the goal of "double carbon", China has formulated a series of policies in energy, industrial structure, ecological carbon sink, carbon footprint, carbon finance and carbon emission trading. Among them, the carbon emission trading system is an important market-oriented supporting measure for "carbon neutrality". Under the framework of "Kyoto Protocol", in 2011, China launched local pilot projects of carbon emission trading in Beijing, Tianjin, Shanghai, Hubei and other two provinces and five cities, and in 2013, local pilot projects began to conduct online trading one after another. In December 2020, the Ministry of Ecology and Environment officially issued the Measures for the Administration of Carbon Emission Trading (Trial). In 2021, China established a national carbon emission trading market, which was officially opened on July 16th of the same year, and successfully completed the first performance period on December 31st of the same year[4].

Scholars at home and abroad have made a comprehensive study on the market-led policy tools to deal with global warming represented by carbon emission trading from the perspective of western economics. Western non-mainstream economic schools, especially scholars represented by ecological Marxism, put forward different views and deeply reflected and criticized the carbon trading solution based on the capital-led market framework[5]. Ecological Marxists believe that the fundamental cause of global climate change is not market failure, but the social and economic relations dominated by capital behind the market. If we don't deeply adjust and improve social and economic relations, we will not be able to fundamentally solve the climate problem[6].

This paper will systematically analyze the operating mechanism of carbon emission trading from the perspective of Marxist political economy: first, sort out the existing research results from the perspective of western economics and Marxist political economy respectively; Secondly, the operating mechanism of carbon emission trading market is analyzed by using Marxist political economy theory; Finally, along the viewpoint and train of thought of Marxist political economy, based on the practical experience of carbon trading in China, this paper explores the development direction of carbon emission trading market in China[7].

2. Explore the Operating Mechanism of Carbon Emission Trading Market

2.1. Tracing Back to the Source: The Root Cause of the Global Climate Crisis

Political economy's concern about climate and ecological crisis can be traced back to Marx's period. Although Marx and Engels have never published works on ecology and environment, and have never used the concept of "ecological civilization", Marx and Engels, based on practice, have integrated their thinking on ecology and environment in the process of demonstrating the dialectical unity of man, nature and society and criticizing the political economy of capitalism. The logical starting point of Marx and Engels' ecological criticism thought is to pay close attention to the living environment of workers under capitalist production. Works such as Das Kapital and The Situation of the British Working Class describe in detail that the industrial revolution not only promoted the rapid development of productive forces, but also caused the proletariat to become increasingly poor, and brought about very serious environmental pollution and ecological problems, which fully revealed the objective fact that environmental disasters frequently occurred under the capitalist system[8].

Marx pointed out: "Capital is not a thing, but a certain, social and historical social production relationship, which is embodied in a thing and gives it a unique social nature." Under the capitalist system, capitalists regard ecology and environment as tools with certain utility, which can bring benefits and realize value proliferation, and pay little attention to the finiteness of ecological resources and the carrying capacity of nature, let alone the production relationship between man and nature[9]. In the process of capitalist production, they only consider how to maximize their own interests and values. Unlimited capital expansion makes mankind overuse

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natural resources, destroys the material exchange chain between man and nature, causes the contradiction between capitalist value proliferation and limited natural environment, and finally leads to global ecological imbalance and ecological crisis.

Marxist political economy profoundly reveals and criticizes the unsustainability of capitalist industrial and agricultural production modes, and points out the anti-ecological nature of capitalism. After the opening of industrial civilization, social productive forces have developed rapidly, and human beings have wantonly exploited and utilized natural resources such as land, water and non-renewable fossil energy, resulting in serious environmental pollution, and frequent ecological problems such as sharp decline in forest area, soil erosion and global warming. By discussing the anti-ecological nature of capitalism, ecological Marxists point out that the root of the global climate crisis is capitalism. The capitalist mode of production, which aims at capital accumulation, has triggered a "metabolic fracture" of the earth's resources and energy by continuously expanding production and pursuing profit proliferation. This kind of fracture will cause serious damage to resources, ecology and environment, and bring about capitalist ecological crisis. O 'Connor called the contradiction between capitalist productive forces and relations of production "the first contradiction" and the contradiction between capitalist relations of production and conditions of production "the second contradiction". According to the double crisis theory, the contradiction between capitalist productive forces and production relations will not only lead to economic crisis, but also induce capitalist ecological crisis, which will lead to the intensification of the "second contradiction" and make the limited natural resources unable to meet the uncontrolled expansion of capital.

The Kyoto Protocol, signed in 1997, established a market-oriented mechanism to solve climate and ecological crises on a global scale. The trading mechanism of carbon emission rights is one of the important contents. Through the operation of the market mechanism, people can set the total amount of emissions, regard carbon emission rights as a "commodity" that can be traded, and achieve the purpose of reducing greenhouse gas emissions through quota trading. Next, this paper will make a detailed analysis of the carbon emission trading market according to its specific operating mechanism.

2.2. Total Verification: Accounting Technical Constraints and Unfair Distribution

The total amount verification mechanism is the key step of carbon emission trading mechanism, and it is also the basis and premise of subsequent carbon emission trading. Through certain principles and regulations, people can include qualified greenhouse gas emission units in the list of key greenhouse gas emissions. The country or region determines the residual carbon emission budget of carbon emission units according to a certain temperature control mechanism, and determines the annual total emission limit of the country or region in combination with economic and social development factors. According to western economic theory, the trading of carbon emission rights can encourage enterprises to reduce greenhouse gas emissions, and under the effect of price mechanism, enterprises will continue to carry out technological innovation, and eventually they will no longer need to buy carbon emission rights or even sell them to obtain income, thus achieving a benign interaction between the market and technological innovation.

In the process of total carbon emissions accounting, a key constraint is the verification standard of carbon emissions. According to the provisions of the Kyoto Protocol, in the process of verification, other greenhouse gases except carbon dioxide need to be converted into carbon dioxide equivalents according to certain standards. However, according to the existing atmospheric science and technology, the measurement standards of the impact of different greenhouse gases on climate change and the calculation standards of converting other greenhouse gases into carbon dioxide equivalent are far from mature and perfect. At present,

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the internationally accepted greenhouse gas accounting standard is "2006IPCC Guidelines for National Greenhouse Gas Inventory", and most countries in the world take this as the standard when formulating their own greenhouse gas accounting systems, but there will be some differences when formulating accounting standards according to their own reality. At the same time, there are usually many adjustments in accounting between different gases. The carbon dioxide equivalent converted by different gases will have a great impact on the formulation of carbon trading prices, and the change of approved standards will also have an impact on the price stability of the carbon market.

Secondly, the existing accounting standards of total carbon emissions in various countries also have the problem of loose total control. According to the total control scheme described in the "Sient Report", the carbon price in the current international carbon market should reach at least 300 US dollars/ton of carbon. According to the available data, the carbon price of EU Carbon Trading System (EUETS) in June 2022 was 85.98 euros/ton of carbon, and the highest price in history was only 95.97 euros/ton of carbon. However, the price of China's national carbon emission trading market in June 2022 was only 59 yuan/ton of carbon, which was far lower than that of the EU carbon emission trading market. Too low carbon trading price will not form effective constraints and restrictions on emission control enterprises, not only will it not be able to reduce emissions, but also will not promote technological innovation or the use of clean energy for emission control enterprises.

In addition, there is also the problem of unfair distribution in the process of total allocation of carbon emission rights. According to IPCC's existing carbon market allocation scheme, from 2006 to 2050, the per capita cumulative carbon emissions of developed countries will be three times that of developing countries. At present, the market allocation of international carbon emissions trading is more inclined to developed countries and multinational enterprises and company groups, and the unfair allocation mechanism seriously violates the principle of "common but differentiated responsibilities" stipulated in the United Nations Framework Convention on Climate Change (UNFCCC). At the same time, this unfair distribution mechanism also provides space and opportunities for developed countries and large enterprises to seek private interests in the process of carbon trading, which will not only fail to achieve the original emission reduction effect, but will make the climate problem increasingly serious.

2.3. Quota Trading: Responsibility Transfer and Pollution Transfer

The quota trading system of carbon emission rights refers to the trading system of greenhouse gas emission reduction targets that must be completed by key emission units in the region according to a certain distribution plan. Its essence is the process of setting carbon emission caps for key emission units in the original free emission field, thus artificially transforming unconstrained emission rights into scarce resource quotas.

From the perspective of Marxist political economy, quota trading regards greenhouse gas emissions as a "commodity" that can be traded, which essentially conceals the fact that the emitters pass on their emission reduction obligations by trading. Under the condition that the total amount verification standard is loose and the market supervision mechanism is not perfect, the greenhouse gas emission reduction target can be easily achieved by paying a lot of fees. At the same time, in the international carbon market transaction, the quota trading mechanism is easily dominated by capital, and the unfair distribution mechanism will lead to the manipulation of carbon emission quotas by capital, which will tilt the quotas to developed countries and multinational enterprises. Excessive carbon emission funds occupied by developed countries and multinational enterprises will squeeze the carbon emission quotas of developing countries and small and medium-sized enterprises to a certain extent, leading to their lack of necessary capital space for investment and emission reduction, and limiting their innovation in emission reduction technology and improvement in emission reduction capacity.

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Secondly, there are some loopholes in the current quota trading mechanism, and the carbon trading mechanism is still in the primary development stage. The defects in the carbon trading market mechanism will have a negative impact on the flow of the carbon trading market. The unfair quota trading mechanism will also lead to a decline in the demand for carbon emission trading of SMEs in the process of crowding out the emission reduction capital, which will greatly reduce the yield of the carbon market and make the carbon market fall into a "liquidity dilemma" of liquidity exhaustion.

The transfer of responsibility for quota trading and the unequal distribution mechanism will also lead to the phenomenon of capital plunder in the process of international carbon market construction. In the process of capital proliferation, developed countries will plunder the resources and markets of developing countries without restraint, transfer industries and enterprises with serious pollution and great demand for carbon emission rights out of their own countries, consume environmental resources and discharge pollutants in developing countries, and transfer ecological risks to developing countries to maintain their capital proliferation and expansion at the lowest cost, leading to the emergence of "ecological colonialism". The implementation of carbon emission quota trading will also lead to "carbon leakage". According to the pollution refuge hypothesis, the quota trading mechanism of carbon emission rights will make developed countries that should undertake the obligation of reducing greenhouse gas emissions transfer high-pollution and high-energy-consuming enterprises and industries to developing countries and regions with weak environmental control through industrial transfer, leading to industrial undertaking countries becoming "pollution paradise" for developed countries. "Carbon leakage" is a negative spillover effect of carbon emission trading mechanism. With the deepening of globalization, "carbon leakage" has become the focus and difficulty of global climate governance.

2.4. Certified Emission Reduction: Speculation and Lack of Supervision

In addition to quota trading, Kyoto Protocol also stipulates three flexible trading mechanisms-Clean Development Mechanism (CDM), Joint Implementation (JI) and Emissions Trading (ET). Among them, joint implementation and emissions trading are flexible emission reduction mechanisms for cooperation between developed countries, and clean development mechanism is an emission reduction trading mechanism for cooperation between developed and developing countries. According to the clean development mechanism, developed countries can provide funds and technology to developing countries, carry out project cooperation, help developing countries to reduce emissions, and then obtain CERs certified by third-party inspection agencies, which can be used by developed countries to offset their own carbon emissions, and finally complete the carbon emission reduction promised by developed countries in the Kyoto Protocol. According to western economics, the clean development mechanism can make use of the cost advantages of developing countries, optimize the cost structure of emission reduction, improve the efficiency of emission reduction in the international carbon market, and provide opportunities for developing countries to attract foreign investment and develop their economies. However, during the implementation of the clean development mechanism, we can see that the clean development mechanism has not achieved the expected results. The existing research shows that the emission reduction effect of clean development mechanism is not obvious in the implementation process, and the emission reduction technology has not been applied in the specific implementation process, but the technology that already exists in the project country and can be used. This not only failed to achieve the purpose of emission reduction and environmental protection, but also aggravated the environmental pollution problem in the project countries. The essence of clean development mechanism is "certified emission reduction". Developed countries do not need to consider the specific development of the project in the process of obtaining "certified emission

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reduction". At the same time, due to the complexity of the real situation, there are also problems of operation and supervision in the actual accounting of "certified emission reduction" of clean development mechanism. During the implementation of the clean development mechanism, developed countries excessively pursue "certified emission reduction", even at the expense of the environment in order to obtain "certified emission reduction", which violates the original intention of this policy. In the carbon trading market, certified emission reduction will also lead to speculation. Speculators speculate in the carbon financial market by verifying emission reduction, and make a lot of profits from it. As financial capital enters the carbon market, the carbon market will become a profit-seeking tool for financial capital.

In addition to the clean development mechanism, there is also a more free voluntary emission reduction trading mechanism in the carbon trading market. Voluntary emission reduction trading mechanism refers to the mechanism that enterprises actively subscribe for emission reduction projects from the voluntary emission reduction trading market. Voluntary emission reduction trading mechanism can improve the corporate image of enterprises in the process of subscribing for voluntary emission reduction projects to a certain extent, but it is easy to have the problem of lack of supervision during the operation of this mechanism. Moreover, the mechanism is based on voluntariness, and it depends on the self-restraint of enterprises to a great extent, so it is relatively difficult to supervise the voluntary and spontaneous behavior of enterprises.

3. Conclusion

As an important tool to solve the global climate change problem, carbon emission trading has played a vital role in the process of ecological civilization construction and achieving the goal of "double carbon". Since the implementation of carbon emissions trading mechanism, many scholars have conducted a series of research and discussion on it from many angles. We should treat the trading mechanism of carbon emission rights dialectically, which can neither be completely accepted without principles nor completely denied. China's carbon trading mechanism needs to be improved, so we should treat the carbon market cautiously, not blindly follow foreign governance models and experiences, make independent decisions, constantly explore the relationship between capital and environment, find the balance between them, and constantly explore better solutions for global climate governance.

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