

Research on the Economic Woes of Carbon Trading Market at Present Stage in China

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Keywords: carbon trading; scarcity; economic woes.

Abstract. China started late on carbon trading. Though we are making rapid progress now, there's still a long way to go to establish a comprehensive nationwide carbon trading market. Among the various practical difficulties which should be overcome, economic woes are main obstacles in the development of domestic carbon trading market.

Introduction

Since 1990, Chinese government has taken up the responsibility of combating climate change. After two decades, carbon trading markets are established as the main policy tools to deal with climate change. But the establishment of an efficient and perfect carbon trading market system needs a lot of conditions. Under the premise of ensuring economic efficiency, relevant carbon trading mechanisms should be built by economic entities with advanced technologies through effective regulations. However, carbon trading market in China is still in early stage of development, and is still facing a variety of practical difficulties. The urgent problems at present are economic woes.

Economic Woes Analyses

In the view of Utility Theory of Value, the combination of utility and scarcity creates commodity value. Scarcity of goods endows them with tradable value, and forms the foundation of market transactions. The scarcity of carbon emission rights comes from the human controlled total carbon emission. But now in China, it is difficult to achieve the nationwide limitation of carbon emissions due to current economic growth mode and industrial structure layout. It is difficult to create carbon emission scarcity, which brings about economic woes on the development of carbon trading market in China.

Carbon emissions come from fossil fuel consumption. As the foundation of modern industrial civilization, the consumption volume of fossil fuels changes with economic development status. American economist Simon Kuznets proposed the Environmental Kuznets Curve which reflected the relationship between carbon emission and economic development. Countries in their initial stages of industrialization create less environmental pollution and emit less carbon; but with the speeding process of industrialization, carbon emissions in these country will increase due to the great quantity of industrial waste gas emissions, and will lead to the deterioration of the environment; but these countries with developed economy can reduce their environmental pollution, and keep carbon emissions in a reasonable level [1].

According to the theory of Environmental Kuznets Curve, China is still in the stage of high economic growth and is highly dependent on energy consumption. Maintaining high speed development is essential for China to realize industrialization and improve industrial structure. By the late industrialization, carbon emissions in China will reach a reasonable level. However, the Kyoto Protocol stipulated that all contracting parties must fulfill the obligation of emission reduction. As the largest developing country, China does not need to fulfill the mandatory obligation of emission reduction.

Macroscopic analysis of economic woes in carbon trading market. On the macro level, it is difficult for China to limit the total amount of carbon emission because of the irrational industrial structure. Since reform and opening up, China has adopted the extensive economic growth path with high pollution, high emission and high consumption. Among the three industries, the second industry consumes most of the energy. In China, the proportion of second industry with high energy consumption, high pollution and high emission remains about 50%. Chinese industrial sector has contributed about 40% of GDP in the past few decades, but it consumed about 70% energy. During 11th Five-Year period, the proportion of heavy industry to total industrial output rose to 70.9% from 68.1%. Industries with high energy consumption and high emission grew too fast, and the goals of energy efficiency were not achieved [2].

The irrational industrial structure increases the difficulty of building a national carbon trading market system. The industrial structure determines the energy structure to a certain extent. China is abundant with coal reserves. The current coal dominated energy structure in China brings the obvious feature of “high carbon” to economic growth. Chinese GDP accounts for 8.6% of the world, but the energy consumption accounts for 19.3%. Energy consumption per unit of GDP is more than 2 times of the world average. Relevant agencies predict that by 2020, China's energy demand will be more than 5 billion tons of coal [3]. The energy structure which cannot be changed in short term determines that China cannot implement the limitation of total emission in the near future, which means the huge challenge and resistance will remain in the way of establishing a national carbon trading market and creating the scarcity of carbon emission rights.

For a long time, Chinese economy is driven by exports and investment, and China has become an important world manufacturing industry base. Apart from the high-energy consumption manufacturing industry, the pressure for cutting emissions in China also comes from infrastructure construction. The proportions of second industry and manufacturing industry to national economy cannot be decreased in a short period.

Microscopic analysis of economic woes in carbon trading market. At the micro level, different enterprises have different bearing capacity on carbon emissions, which affects the implementation of limitation policy. In many high-energy consumption industries, such as paper industry, cement industry and steel industry, different enterprises have relatively large differences in company size and technical level. Large enterprises have technical advantages and high profit rates, and they are able to maintain strong competitive abilities in the face of constraining the total amount of carbon emission. While small companies without technical advantages and high profit rates will suffer a lot from this constraint. The constraining of total amount of carbon emission will add difficulties to Chinese small and medium enterprises, creating more sufferings to these relatively weak private-sector companies.

At present, the allocation pattern implemented in carbon trading pilot areas also adds difficulties for creating scarcity of carbon emission rights. In 2011, the National Development and Reform Commission approved seven carbon trading pilot areas, include Beijing, Tianjin, Shanghai, Chongqing, Hubei Province, Guangdong province and Shenzhen. All these areas allocate carbon emissions quota for free. Enterprises can get carbon emission rights easily according to the historical data of their carbon emissions. The biggest disadvantage of this allocation method is the over allocation; that is, the amounts of carbon emissions allocated to enterprises are more than their actual needs. In carbon emissions trading market, the free allocation of carbon emissions cannot bring about market transactions, or the scarcity of carbon emission rights. Market demand cannot be stimulated, let alone the price of carbon emission rights. Paid distribution should be combined with free allocation to promote the normal development of carbon trading market. Currently, only the carbon trading pilot scheme in Tianjin puts forward to the distribution pattern of combining free collocation with certain amount of auction, but the proposal still remains to be discussed by management departments. Even when these pilot areas adopt the method of combining free allocation and a certain amount of paid distribution, it will be still difficult to drive demand on carbon emissions. Now there is no limitation on total amount of carbon emissions in China, enterprises have enjoyed the free distribution pattern for years, and they will not accept the idea of paid distribution without the awareness on the scarcity of carbon emission rights.

In addition, the low liquidity of domestic carbon trading market also has negative impacts on the scarcity of carbon emission rights. At present, all the designing programs of building domestic carbon trading markets only consider enterprises of carbon emission sources as the main market participants. A mature carbon trading market should include direct dealing, spot trading and futures market. The introduction of financial institutions in futures market can increase the liquidity of carbon trading market. But in 2011, the State Council issued *The Decision to Straighten out All Types of Trading Venues to Effectively Guard against Financial Risks*, and strictly formulated the futures exchange markets. According to the decision, all domestic carbon exchanges in China are not qualified for futures trading [4].

In November 2009, the State Council approved a decision, stipulating that by 2020, carbon dioxide emissions per unit of GDP should decrease by 40%-45% than 2005. The decision was added into the national economic and social development long-term plans. In December 2009, Chinese government made the commitment in Copenhagen Conference [5]. This is the first commitment of carbon reduction from China. In the initial stage of carbon trading market development, there were no enough theoretical studies and corresponding measures to deal with these problems; moreover, governments of all levels only emphasized the development speed to ensure the rapid economic growth. These led to the increase of total carbon emissions in China in the next period of time. At present, there are no limitations or quota systems on domestic carbon emission market, while enterprises are lack of driving force to buy carbon emission rights. Market liquidity is low, while the perfect and unified carbon trading market is not fully shaped. It is unable to bring the market into full play. Under the current economic growth mode and industrial structure layout, we cannot achieve the nationwide limitation of carbon emissions. Thus, it is difficult to create carbon emission scarcity, and the economic woes on the development of carbon trading market still remains.

Countermeasures and Suggestions

Taking the international development experience and other countries' developing patterns of building carbon trading markets as reference, this paper puts forward to a series of practical countermeasures and suggestions on developing Chinese carbon trading market on the basis of present condition of China, as well as the practical difficulties and development trends of domestic carbon trading market.

Improving energy efficiency and optimizing energy structure. Among major economies in the world, energy intensity in China decreases relatively rapidly; but the number is still high. The energy efficiency in China is relatively low. The energy intensity per unit of GDP of other two major economies, the United States and Japan, only accounts for 17% and 14% of China [6]. The reduction of energy intensity can significantly cut carbon emissions. Thus, reducing energy intensity will provide a strong driving force for controlling China's total carbon emissions. The government should continue to increase investment in science and technology, and vigorously promote the establishment of research and development mechanisms in enterprises, scientific research institutions and universities. Scientific and technological fruits should be timely transformed into productive forces. At the same time, state-owned enterprises should accelerate their paces of reform and improving production efficiency. Meanwhile, the government should formulate relevant laws and regulations to provide a solid legal system protection for improving energy efficiency and reducing energy intensity.

Optimizing domestic energy consumption structure does not have obvious positive effect on the development of carbon trading market, but it has great practical significance. Chinese energy consumption structure is characterized as “deficient oil, lean gas, rich coal”. Coal consumption accounts for a large proportion of energy consumption in second industry. Hence, when optimizing energy structure in second industry, the fruits of the carbon emission reduction are largely offset. In the short term, trying to control the total amount of carbon emissions and reduce the intensity of carbon emissions through energy consumption structure adjusting is not a feasible solution for China, since the energy supply and consumption in China relies on coal resource. But from a long-term

perspective, we can improve the energy structure through using more clean energy and new energy. We need to strengthen the investment in science and technology, research and design new techniques on energy efficiency improving and clean coal developing, speed up the development of clean energy like hydropower, nuclear power, wind power, solar energy and tidal energy, increase the proportion of new energy and renewable energy, maintain the sustainable development of clean energy and new energy, and gradually reduce the proportion of coal in energy structure.

At present, the proportion of green energy in the global energy structure is about 15%-20%. Using green energy can alleviate energy crisis and reduce carbon emissions greatly. In order to achieve the sustainable and healthy development of Chinese carbon trading market, we should develop and make full use of green energy. Using green energy is the irresistible trend in the future, and has broad development prospect. Chinese government should provide more policy support on green energy industry to promote its growth and development.

Accelerating the upgrading of industrial structure. Now China is in the key period of industrialization process. The development of industry, especially the heavy industry remains the priority in domestic policies. The flexible space of energy consumption growth is continuously squeezed by the improving industrial output ability, resulting in the increasing carbon emission and energy consumption per unit of GDP. Carbon trading market cannot achieve sustainable development without the upgrading and transformation of industrial structure. The proportion of technology and service based third industry should be increased gradually to optimize the industrial structure, change the economic growth mode, and get rid of the vicious economic development circle of high pollution, high emissions and high consumption. According to Environmental Kuznets Curve, when China enters the later period of industrialization, the comprehensively optimized industrial structure and higher level of economic development will be achieved. The economic development will slow down the pace of energy consumption, and then the carbon emissions will decrease to a more reasonable level. But at present, the long-term unbalanced industrial development and industrial policies have led to the rigidity of domestic industrial structure. It will take us a long time to achieve the overall optimization of industrial structure. At the same time, China has become a big country in global energy consumption and carbon emissions; but now we cannot change the coal based energy structure immediately. It causes increasing pressure for China to adjust industrial structure. When promoting the upgrading and transformation of industrial structure, we should follow relevant rules, try to maintain the high-speed development of second industry, and promote the development of third industry and modern service industry, in order to optimize the industrial structure, and reduce the dependence of economic growth on resources and the environment.

In Chinese industry, heavy industrial sector is the focus of industry policy and investment. To accelerate the pace of optimizing and upgrading of industrial structure, we should start from heavy industry. First of all, we should speed up the pace of reorganizing and integrating resources. At the same time, relevant scientific and technological input needs to be increased to encourage technological innovation and product upgrading. Meanwhile, we need to vigorously promote the development of high-tech industries and modern service industry, and to increase the proportion of third industry in domestic industrial structure, in order to achieve the quality improvement of economic growth, and transform the extensive Chinese economic growth mode to intensive one. The transformation and upgrading of second industry play important roles in reducing domestic energy intensity, increasing energy efficiency and controlling carbon emission. The industrial structure can be upgraded through the transmission of production factors from industries with high pollution, high emission and high consumption to technology-intensive industries and modern service industries. These industries can develop faster through the flow of production factors. In the meantime, we need to accelerate technological innovation in carbon emission reduction. These are necessary means for China to realize new industrialization. At the same time, we should pay attention to the driving force of technological innovation and technological progress in optimizing industrial structure, and try to realize the mutual promotion of science, technology and industrial structure, then the rational adjustment and upgrading of industrial structure will be achieved.

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