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Environmental Regulation and Economic Growth

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Abstract

With the consumption of resources in global economic development, environmental issues have gradually become an important factor limiting global sustainable development. In order to achieve green economic development and sustainable human development, the Chinese government has continuously introduced various environmental regulation policies to maintain ecological balance. This paper takes environmental regulation policies as a premise and analyzes the intrinsic influence mechanism between environmental regulation and economic growth, and comes to an important conclusion that environmental rules may lead to higher economic operating costs and lower economic efficiency in the short run, but in the long run, environmental rules strongly promote long-term healthy and sustainable economic development by promoting technological progress.

Key words: Environmental protection; Regulation; Economic growth

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1. PREAMBLE

Since the reform and opening up of China in 1978, the level of economic development and comprehensive national power have achieved rapid growth, and the standard of living of the people has been improving. Along with economic development, environmental problems have gradually emerged and become the main negative factor limiting economic development and ecological construction, so the development of China's economy must be shifted from the traditional sloppy development mode to an intensive and high-quality development mode. The Chinese Government has clearly stated in the General Programme for Reform of the Ecological Civilization System that it adheres to the basic state policy of resource conservation and environmental protection, and calls for improving the efficiency of resource utilization and environmental quality. In today's economic development process, ecological environment and economic growth are no longer "trade-offs", but must be "a balance of both".

In order to protect the ecological environment, the government has introduced a series of environmental policies from various angles to restrain public behavior, i.e. environmental regulation, and tried to improve the environmental level through specific restrictive policies to limit the development of high pollution and high energy consumption type enterprises, reduce environmental pollution and protect the resource environment. Environmental protection is the general trend. However, economic development is also an important issue facing China at present, and both have a very important strategic position. The relationship between environmental regulation and economic development is not simply one versus the other, because it is highly necessary to explore the mechanism of the influence of environmental regulation on economic growth, and only by clarifying the relationship between the two can we better play a benign role in promoting environmental protection and economic growth, and never promote the country's Only by clarifying the relationship between the two can we better play a positive role in promoting environmental protection and economic growth, and thus promote the overall sustainable development of the country.

China's policies on environmental regulation are mainly based on the Marxist ecological outlook

and are characteristic environmental regulation instruments adapted to socialist civilization with Chinese characteristics. Combining the current level of economic development and the characteristics of the natural environment, there are three main forms of environmental regulation policies in China, namely, public participatory, direct command and market regulation. The different types of environmental regulatory policies correspond to different fields and sectors, combining and cooperating with each other to promote China's regional environmental protection on the basis of the advantages of different policies. The three types of policies have different characteristics in terms of implementation strength and mechanism of action, and all have a certain degree of positive effect on improving the environment. The first type is public participation environmental regulation, in which the government actively promotes and educates the public to accept the concept of environmental protection, build up the awareness of environmental protection, and take the initiative to reduce pollution and protect the environment from the internal psychological perspective. The second type is direct command environmental regulation policy, which refers to the policy of setting laws and regulations to explicitly prohibit enterprises and individuals from polluting the environment, and setting a punishment mechanism to restrain the behavior of polluting the environment, this approach generally plays a direct and significant role in environmental protection. The third type is market-regulated environmental regulation, which gives full play to the power of the market, and the people restrain their own behavior through the signals released by the market itself, which never serves the purpose of reducing environmental pollution (Fan & Sun, 2020; Wu, Qian, & Zhang, 2021).

Since China's economy has fully entered the new normal stage, especially with the emergence of the new crown epidemic and the complex and changing international situation, it is difficult for the economy to develop as rapidly as before, and the growth rate of GNP tends to slow down. 2020, China's GNP is one of the few countries in the world that guarantees positive GDP growth, but due to the previous brutal way of economic growth, facing the global carbon The Chinese government has been strengthening its environmental regulations in recent years due to its previous brutal approach to economic growth and the enormous pressure of global carbon emissions control. Faced with the dual pressure of environmental protection and economic development, it is of great theoretical value and practical significance to study the correlation between the two.

2. REVIEW OF THE LITERATURE

Regarding the study on the relationship between environmental regulation and economic growth, many scholars have carried out in-depth analysis and proof of this issue, and different scholars hold very different attitudes. A part of scholars based on the cost perspective, that environmental regulation will increase the overall operating costs of enterprises and reduce the efficiency of business production, so for enterprises, environmental rules undoubtedly play a great negative role. Jorgenon in the study of the impact of environmental regulation in the United States found that with the increase in the intensity of environmental regulation, the United States has a trend of rising unemployment rate and declining gross national product (Jorgenon & Wilcoxen, 1990). Levinson et al, in their study of the impact of environmental regulation on enterprises, found that in order to cope with environmental regulation, enterprises had to increase the cost of pollution prevention and control, which compressed the cost of technological innovation and increased product prices, which in turn reduced the competitiveness of their products (Levinsohn & Petrin, 2000). Chinese scholars had reached similar conclusions when studying the issue, and Jiang Yong used the Durbin model to study the overall employment rate level in China and found that as environmental regulations became more stringent, they had a stronger negative effect on the employment rate, making the employment level face greater negative pressure (Jiang & Yang, 2019). In his study of the economic development index system, Tong Jixin found that environmental regulations not only affected economic development (Tong & Wang, 2018), but also did not have the positive effect on the haze problem that it should have. There are also some scholars based on "Porter's hypothesis", they believe that environmental regulation can, to a certain extent, encourage enterprises to take the initiative to transform external costs, improve the efficiency of business output, and never increase the earnings of enterprises, that is, environmental regulation has a positive effect on enterprise development, which is diametrically opposed to the findings of the previous scholars. Telle in analyzing the role of environmental regulation in different regions found that the higher the intensity of environmental regulation, the higher the productivity, and the two showed a significant positive correlation (Telle & Larsson, 2007). Hao Rui, in his study of regional economic development in China, found that environmental regulation is not only beneficial to ecological restoration, but also can promote the optimization of regional economic structure, i.e., environmental rules generate a double impetus (Hao & Huo, 2017). However, some scholars believe that the role of environmental regulation on business and economic development is uncertain, both positive and negative effects are unstable. That is, in some time periods, or in some regions, environmental regulation has a positive effect on economic development, but in other time periods and in other regions, there is a negative effect.

With the development of science and technology, and the global environmental crisis. With the emergence

of the energy crisis, experts' research on the impact of environmental regulation has become more and more extensive and in-depth. However, the research indicators on the impact of environmental regulation are relatively single and mainly focus on the direct impact on the economy. This paper mainly analyzes the correlation between environmental regulation and economic growth from an indirect perspective, and tries to explore how economic development and environmental regulation can achieve a complementary and co-development situation.

3. MECHANISMS OF INFLUENCE

3.1 Current Status of Environmental Regulation in China

Since the implementation of China's reform and opening-up policy in the 1980s, the Chinese economy has made a quantum leap by relying on a high pollution and high energy consumption industrial model. However, with the aggravation of the global environmental pollution problem and the crisis problem of resource and energy consumption, the government is increasingly aware of the importance of environmental protection and resource conservation. Taking carbon emissions, which are currently very hotly researched, as an example, China is placing increasing emphasis on carbon emissions. China's Ministry of Ecology and Environment (MOE) released the National Measures for the Administration of Carbon Emissions Trading (Trial Implementation) and the National Measures for the Administration of Carbon Emissions Registration and Trading Settlement (Trial Implementation), making public and seeking comments on the two documents. This is the first time that systematic rules have been issued at the national level since the launch of the national carbon emissions trading market in 2017. According to the documents, the coverage of the national carbon market includes that enterprises or other economic organizations whose annual greenhouse gas emissions reach 26,000 tons of carbon dioxide equivalent, or a comprehensive energy consumption of about 10,000 tons of standard coal and above, will be included as key emission units.Since 2011, seven provinces and cities, including Beijing, Shanghai and Hubei, have joined the pilot. At present, a total of 2,837 key emission units, 1,082 non-compliant organizations and 11,169 natural persons are participating in the pilot carbon market, covering more than 20 industries such as electricity and steel. By the end of August, the cumulative volume of allowances traded in the seven pilots was 406 million tons, with a cumulative turnover of more than 9 billion yuan. The construction of a national carbon market is an institutional innovation to use market mechanisms to control and reduce greenhouse gas emissions and promote green and low-carbon development, as well as an important grip to implement the new Co_2 peak target and carbon neutral vision. The development of China's carbon market follows the path from "pilot" to "national". "The 12th Five-Year Plan is a pilot project, the 13th Five-Year Plan is a foundation for the national carbon market, and the 14th Five-Year Plan is a milestone period in which the carbon market will move from a single industry to a multi-industry market, from the start of trading to a sustainable market. The 14th Five-Year Plan is a milestone period, in which the carbon market will be transformed from a single industry to a multi-industry one, and from the start of trading to a stable and sustainable operation. During the 14th Five-Year Plan period, stronger carbon emission control targets will be proposed to strengthen the control of coal consumption, increase support for the development of renewable energy, and continue to promote economic development. During the 14th Five-Year Plan period, we will propose stronger carbon emission control targets, strengthen control on coal consumption, increase support for the development of renewable energy, and continue to promote the accelerated transformation of the economy and society towards low carbon. Unlike developed countries where carbon markets are established against the backdrop of peaks and yearly declines, China's carbon emissions are still on the rise, and it is necessary to develop a system design suitable for China's national conditions based on the absorption of advanced experience. It is recommended to speed up the establishment and perfection of the national carbon market system, and to release in due course important supporting management regulations such as enterprise emission reporting management measures; to optimize the carbon emission data reporting system, improve the national carbon market registration system and trading system construction plan and speed up the implementation; to promote key units to complete the reporting of carbon emission data and third-party verification work, etc.

3.2 Economic Growth Theory

The study of economic growth has been around for a very long time, and different economists and schools of economics have analyzed the sources of economic growth from multiple perspectives. Among them, Adam Smith believed that the fundamental cause of economic growth lies in the accumulation of capital and the division of labor, and in the neoclassical school of economics, Solow's model of economic growth is the most classic, Solow believed that technological progress is the source of economic growth, and then economists Romer and Lucas extended Solow's model by arguing that technological progress is an exogenous variable, capital and labor are endogenous variables, and that technological progress is in the economy are created to generate, i.e., as the level of technology increases, the economy grows accordingly. Using the Cobb Douglas production function as an example for analysis: $y=A(t)\ L\alpha K\beta\mu$, according to the model it can be seen that the main factors determining the level of development of the

industrial system are the number of invested labor, fixed assets and the level of integrated technology (including the level of business management, quality of labor, introduction of advanced technology, etc.). According to the combination of α and β, it has three types, but regardless of the variation of the sum of α and β, the increase in the level of technology always raises the level of economic development.

The current carbon peak, carbon neutral and each of us has a personal relationship, its both challenges and opportunities, is likely to drive the industrial revolution since the technology structure, industrial structure and even the entire development mode of the overall situation, the systemic major changes. Photovoltaic, wind power is China's advantageous industries, a new generation of photovoltaic is also being developed, the current general reached more than 20% efficiency, the future to 30% is entirely possible, the technical potential is still very large. In addition, battery technology, especially lithium batteries, is likely to innovate again in the next ten years, just the application of lithium batteries in the automotive industry is a very large market, after the electrification of cars, intelligent technology will also be combined with it, and even progress to self-driving, if the source of electricity into wind power, photovoltaic, which is a multi-trillion yuan industry. The slightly more difficult area of hydrogen energy has now also made a major breakthrough. Thus the technology will be able to develop rapidly. According to the Solow model mentioned earlier and Romer's economic ideas, technological progress will drive the economic level, so in the long run, environmental regulation is a positive driver of economic growth, and this mechanism of action, i.e. environmental regulation - technological progress - economic growth. Although the final result is positive and positive, the intermediate process may be tortuous and spiral, especially where environmental regulation is implemented, enterprise development will lead to a decline in short-term operating efficiency due to the existence of environmental regulation, however, in order to cope with the restrictions of environmental rules, enterprises have to increase their investment in technological development, which in turn reduces the production costs of enterprises through technological progress and improves production operational efficiency and effectiveness. All these technologies will allow the economy to achieve high quality growth, a green growth, and will allow the country, the economy and society to enter a whole new phase and era.

4. CONCLUDE

Environmental and resource protection is not only a regional goal, but a requirement for healthy and sustainable development worldwide. Both environmental issues and economic growth are key factors limiting a country's long-term stable development. Under the dual pressure of slowing economic growth and reducing carbon emissions, the Chinese Government has focused on the goal of carbon neutrality in the 14th Five-Year Plan. The relationship between environmental regulation and economic growth is not simply mutually exclusive or mutually reinforcing, but should be analyzed on a case-by-case basis in order to better achieve the goal of sustainable development. In this paper, we analyze the economic growth theory of Solow and Romer as an example. Technology is an important exogenous force to promote economic growth, and the existence of environmental regulation policy forces enterprises to constantly update their technological means and promote technological progress, thus strongly promoting the overall development of the economy, but we cannot ignore that in the influence mechanism of environmental regulation - technological progress - economic growth, at the place of environmental regulation, in the short term may lead to a decline in business efficiency due to the increase in costs, so this is a long-term promotion process, and a short-term economic decline does not negate the role of environmental regulation.

Environmental regulation is an important tool for the government to regulate environmental issues. Faced with the pressure of economic downturn, local governments at all levels cannot simply oppose environmental regulation to economic growth, but should look at the issue from a development perspective; environmental protection is an important prerequisite for sustainable development, and in the process of formulating environmental regulation policies, they should fully consider their short-term and long-term effects on economic development and avoid short-sighted behavior, while at the same time give full play to the active role of the people in environmental protection and economic growth.

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