

How Does Environmental Regulation Promote Economic Growth?

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Abstract—In the 21st century, environmental pollution has become one of the most important problems in the world and has received extensive attention in recent decades. Whether environmental regulation can promote high-quality economic development? Combine Chinese actual situation, we analyze the effect of environmental regulation on the expansion of the Eastern, the recovery of the Northeast, the escalation of the Central region, and the expansion of the Western region. At last, Combine the actual situation of different regional, we find that environmental regulation can promote economic growth.

Keywords—environmental regulation; economic growth; high-quality development

I. INTRODUCTION

Protecting the environment is a necessary condition for the sustainable development of all mankind. Environmental pollution is among the most concerning issues in the world in the 21st century. The intensity of environmental pollution is controlled by many regulations and rules, which is introduced by governments of many countries. China has successively formulated or amended a lot of regulations and rules, and gradually formed an environmental regulation system based on the Environmental Protection Law, which consists of five parts: environmental standards, environmental impact assessment, environmental supervision, and environmental regulation policies and methods. In addition to the unified environmental policy formulated by the state, each region and city has also formulated its environmental protection laws for its geographical characteristics and economic characteristics.

The economy in China has shifted from high-speed growth to high-quality development. High-quality development means that we should move from extensive development with high energy consumption and high pollution to sustainable development in a green, intensive, and efficient way. Environmental regulation has different effects on economic growth in different regions of China. Porter, the initiator of the “Porter hypothesis”, proposed that environmental regulation

would not hinder economic growth, but would bring “innovation compensation” and “optimization efficiency” to promote economic growth. Under the condition of environmental regulation, governments and enterprises in different regions take different measures to promote local economic growth according to the actual situation of the locality. From the perspective of geography and social development, there are four major economic parts in China, including the eastern region, the northeast region, the central region, and the western region.

II. LITERATURE REVIEW

A. Environmental regulation

Environmental regulation is an essential part of the Chinese formal environmental administration system. Economic growth alone cannot alleviate environmental pollution, so environmental regulation must be added. Environmental regulation is an essential part of the Chinese formal environmental administration system. Under the reasonable environmental regulation, green innovation has been improved and the industrial development model has also been changed. Currently, literature has explored various relations between environmental regulation and green technology innovation, including linear relations and nonlinear relations. For example, Ling Li and Feng Tao (2012) established the relationship among environmental regulation and green total factor productivity based on the panel data model, trying to find the inflection point of the optimal environmental regulation strength of different industries from the perspective of promoting productivity[1]; Fuxin Jiang et al. (2013) research showed that there is a “U” dynamic relationship both the green technology innovation and the decline. As the strength of environmental regulations rises, the “offset effect” will change to the “compensation effect”[2]. However, the above literature does not effectively distinguish the types of environmental regulations, so it is impossible to discover the heterogeneous

effects of different kinds of environmental regulations on the efficiency of green technology innovation.

B. Economic growth

Economic growth can be defined as the increase in the inflation-adjusted market value of the goods and services produced by an economy over time. High-quality development in the new era must coordinate the relationship between development speed and quality. We will put quality first and give priority to efficiency. The key is to raise total factor productivity and replace old growth drivers with new ones. Pearce and Turner (1990) believe that the relationship between development and environment gives rise to the concept of sustainable development[3]. Papalia and Bertarelli (2013) established the model based on entropy calculation and found that there was an obvious convergence effect of clubs in the economic growth of some countries[4]. He Xiaoyu et al. (2018) constructed the evaluation index of the modern economic system, the estimation method of space Durbin model is adopted, empirical analysis of how the modern economic system to improve total factor productivity, and how to affect the mechanism of high-quality economic development.

Some scholars have empirically found that environmental regulation improved the industrial green total factor productivity of Norway through the data of industrial enterprises in Norway (Telle & Larsson, 2007)[5]. Other scholars concluded that research and development subsidies and carbon tax can effectively improve green economy growth by the investigation of environmental regulation and the efficiency of green innovation (Ploeg & Withagen, 2013)[6]. Economic growth alone cannot alleviate environmental pollution, so environmental regulation must be added. When carbon duty tariffs and carbon release reduction support grasp a sure level, it will promote green energy technology innovation, thereby reducing environmental pollution caused by economic activities.

C. Environmental regulation and Economic growth

The relationship between environmental regulation and economic growth has always been a hot topic in economics research. New classical economic theory holds that environmental regulation internalizes the social cost of enterprises' emission. Therefore, improving the intensity of environmental governance will increase the cost of pollution control and reduce enterprise performance. The mainstream scholars, such as porter, hold the opposite view. It is believed that strict and reasonable environmental regulation can stimulate enterprises to carry out technological innovation and obtain product innovation compensation. There is also a view that the effect of environmental regulation on enterprise performance is uncertain. They believe that only appropriate and effective environmental regulation can stimulate or force enterprises to choose innovative development. Therefore, the effect of environmental regulation on enterprise performance is uncertain.

III. DISCUSS: THE EFFECTS OF ENVIRONMENTAL REGULATION ON ECONOMIC GROWTH IN DIFFERENT REGIONS

There are four major parts of economic and social development in China, including the expansion of the Eastern,

the recovery of the Northeast, the escalation of the Central region, and the expansion of the Western region. Below we discuss the effects of environmental regulation on economic growth in different regions.

A. Environmental regulation boost the increase of clean investment in the Eastern region

The most economically developed region in the Eastern region in China, which include the Hong Kong Special Administrative Region, the Macao Special Administrative Region, Beijing Municipality, Shanghai Municipality, Tianjin Municipality, Jiangsu province, Zhejiang province, Guangdong province, Hebei province, Shandong province, Fujian province, and Hainan province. The impact of economic growth on the environment has become entrenched, and environmental regulation measures are urgently needed. There are many diversities between the strength of environmental regulation and the means and emphasis of environmental regulation in different regions. The early extensive economic development has affected the eastern region. Because of the rapid development of the 2nd and 3rd industries in the eastern part of China, especially the tertiary industry, its environmental conditions are more concerned than those in the western part. The economic support has shifted from energy-intensive heavy industries to service industries and technology-intensive industries. The development of the economy is relatively perfect in the eastern region, and enterprises have more ability to control the environment and realize the optimization of the environment. By increasing the input of innovation and improving the production efficiency of enterprises, enterprises have more capacity to deal with environmental problems, and the effect is more obvious. The government's environmental regulation policy should focus on controlling the number of enterprises with serious pollution and promoting the increase of clean investment. There may be some high-pollution-intensive industries in economic development, which will cause great environmental pollution. In this case, relevant environmental protection departments should formulate relevant policies. For example, we can establish high-pollution industrial development zones, concentrate these industries in the development zones, conduct unified management, and reduce environmental pollution as much as possible. It is essential to strengthening the creative investment in the eastern region and the improvement of the production efficiency of enterprises. The influence of environmental regulation in the central and western regions is lower than that in the eastern region. The breach of the Shenzhen Special Economic Zone in the eastern part of China in the 1980s encourages the evolution and exploration of the Pearl River Delta region. The improvement and evolution of the Yangtze River Delta and the Yangtze River Basin are induced by the breach and development of the Pudong New Area in the 1990s. The Pearl River Delta and the Yangtze River Delta quickly jumped into the most active "two poles" of the Chinese economy. The eastern part of China is more capable of supporting the elevation of the advancement of the western region, the resuscitation in the northeast and the acceleration in the central region, promoting and forming a good situation of the interaction between the West, the East and the coordinated improvement of the national economy.

B. Environmental regulation encourages public participation in ecological environment protection in the Northeast region in China

There are Hulunbeier city in the Eastern Inner Mongolia Autonomous region, Chifeng city, Heilongjiang province, Jilin province, Tongliao city, Xing'an League and Liaoning province in the Northeastern region. After years of extensive development and a deteriorating green situation in the northeast region, the government has adopted strict environmental regulation policies to deal with environmental pollution and ecological damage. With the support of the central government and local government, the industrial has been reinforced and economic growth has been attained outstanding outcomes in the northeast region in China. Zhenling Song et al. (2009) believe that environmental regulation, especially the unsound legal mechanism of ecological environmental protection, is an important cause of ecological environmental problems of the old industrial base in Liaoning Province. Therefore, we should improve the participation of environmental protection in the whole society, reinforce the public consciousness of environmental guard and publicity and education on environmental protection, and form a popularization of environmental awareness in the Northeast.

First, establish an environmental education network in the Northeast region and carry out training on capacity building for environmental education institutions. The publicity and education of ecological environmental protection are reflected in the strengthening of environmental education and training for leading cadres, and the establishment of environmental protection courses at schools at all levels; On the other hand, the organization of Walkman, TV set, daily and periodicals and other news media widely announce the guidelines, policies, laws, and regulations on ecological environmental protection, and organize environmental protection public welfare activities promptly.

Second, strengthen the construction of ecological culture and promote the formation of green consumption methods. Improve community residents' awareness of environmental protection, popularize green concepts, and advocate green living. Guide enterprises and the public to actively participate in the low-carbon economy and low-carbon life. Because the economic development levels of different regions are quite different, environmental regulation cannot be uniform and cannot go into the misunderstanding of blindly improving the strength of environmental regulation. We should maintain appropriate environmental regulation intensity following the status quo of different regional economic developments, and prevent misunderstandings from infinitely increasing the strength of environmental regulation. Environmental regulation in Northeast China can directly promote economic growth through environmental regulation. It can also make environmental regulation play a constructive role in economic growth through factors such as physical capital, human capital, technological progress, and industrial structure.

C. Environmental regulation guarantees the perpetual growth of the economy by leaps and bounds in the Central region

There are many provinces which include Anhui, Henan, Hunan, Shanxi, Jiangxi, and Hubei in the central region.

Afterward 70 years of advancement since the setting up of the People's Republic of China, the central region takes formed a relatively strong traditional economic foundation, with a certain amount of science, instruction, talent, and technology. Under the background of promoting the growth of the central region, the structure and improvement of environmental regulation is both the need of the times and the key to development. At the end of 2016, the State Council delivered the "Reply on the 13th Five-Year Plan for Promoting the Rise of the Central Region", requiring the six central provinces to adhere to the green development strategy, create a regional ecological demonstration zone in the central region, increase the concentration of green and ecological defense in the central region, fully implement the development philosophy that "green mountains are mountains of gold and silver", build a blue-sky, green-land, clean-water and beautiful-home.

The Central region of China plays a role in the economic growth of the bridge and the link between the east and the west, and the south to the north. The location is very obvious. The industrial structure in central China has also been well upgraded in recent years. In the past, the industrial structure in central China was a typical "one, two, and three" type industrial structure. In the later development process, the secondary industry and tertiary industry in this region had a good development, and the leading position of agriculture was gradually substituted. However, the industrial structure in the central region is low related to the eastern region. Therefore, for the specific situation in the central region, we should first ensure that the governance of environmental pollution is well controlled. To carry out the strict and thorough management of the pollution already caused, and then play its advantages. For example, the advantages of resources and labor force should be used to actively develop ecological agriculture, energy industry, tourism and entertainment, catering, and other services supporting these industries. At the same time, we should further deepen market reform, revitalize state-owned enterprises, accelerate the process of industrialization and industrial technology transformation, and make the local economy better and better. We can also further study the quantitative characteristics in the procedure of undertaking business transfer and industrial promotion in the central region and analyze whether these industries have the characteristics of structural change in the sense of environmental economics.

D. Environmental regulation encourages the improvement of environmental regulations in the Western region

There are many provinces which including Sichuan, Yunnan, Gansu, Guizhou, Qinghai, Shanxi, and the western part of Inner Mongolia autonomous region, Ningxia hui autonomous region, Xinjiang Uygur autonomous region, Guangxi Zhuang autonomous region, Chongqing municipality, and Tibet autonomous region in the Western regions. The importance of environmental regulation cannot be ignored in the western region after commercial development. Porter's "Porter hypothesis" proposed by Porter (1991) holds that, instead of restraining the development level of enterprises, moderate environmental regulation will force enterprises to innovate in technology, to obtain market competitive advantages, realize industrial transformation and upgrading from within enterprises, and protect the ecological

environment[7]. Because the natural environment in the western region is relatively delicate, if it is allowed to develop for a long time, it will affect the long-term growth of the economy. The western region where commercial development started late has a “post-development advantage”. Due to the sparsely populated area and relatively closed information in the western region, financial subsidies and national policy support should be increased through various means of mass media. According to the affordability of local finance and the bearing capacity of the company, trial subsidy programs to encourage the adoption of environmental protection technologies should be reasonably developed through calculation.

The industrial layout and economic layout of the western region are relatively backward compared with other areas. The investment environment in the western region is also not optimistic, so the local industrial enterprises are mostly state-owned enterprises that have many disadvantages, such as rigid thinking, mixed management, lack of market awareness. So, we must pay attention to the undertaking of foreign capital. Foreign direct investment can directly drive the transformation of the big and medium-sized state-owned firm and the transformation of modernization. Therefore, we should focus our economic development on modern light industries with low investment but high efficiency and high accumulation. To protect the environment in the western region, when foreign businessmen intend to invest in the western region, we want to invest in the environmental standards of the home country of the multinational firm to demand it and cultivate the staff’s awareness of environmental protection.

The statement of the 19th National Congress listed the creation of natural evolution as the millennium plan for the maintainable progress of the Chinese country. It pointed out that “Chinese economy is in the step of altering the growth style, enhancing the economic structure, and transmuting the development impetus period”. Environmental protection and promoting high-quality economic development are the main targets of the government. The government needs to change the traditional performance assessment standard of “the only GDP” and increase the weight of environmental protection and green development indicators in the performance appraisal policy of officials. In the short period, the value of economic rise will decline by the growth in the power of environmental regulation. But in the long period, the enhancement of the quality of economic growth will improve.

IV. CONCLUSION

The environmental right is a kind of human rights, everyone has the right to live in a clean and pollution-free

environment. The government should vigorously encourage the development of the clean industry; let clean energy gradually replace non-renewable energy. Enterprises need to invest a lot of manpower and material resources in technological innovation. They can make use of the market mechanism to carry out green innovation and create a better ecological environment.

From what has been discussed above, environmental regulation can promote the increase of clean investment in the Eastern region; encourage public participation in ecological environment protection in the Northeast region; guarantee the perpetual growth of the economy by leaps and bounds in the Central Region, and encourage the improvement of environmental regulations in the Western region. The government should improve the standard system of environmental regulation and promote economic growth.

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