

Research on the Promotion Strategy of Green Economic Efficiency

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Abstract

Based on the in-depth analysis of the factors affecting GEE, this article discusses in-depth suggestions to improve GEE. The research results show that the economic development level and environmental regulation can significantly improve GEE. FDI, industrial structure, and energy structure will have a significant negative impact on GEE. The impact of new urbanization on GEE is not significant. To this end, this article puts forward suggestions to promote GEE, such as transforming the economic development mode, optimizing the energy consumption structure, increasing the level of foreign capital introduction, accelerating the adjustment of industrial structure, and promoting the coordinated development of new-type urbanization in the region.

Keywords

GEE; Influencing Factors; Countermeasures.

1. Introduction

Since the reform and opening up, China's economy has grown rapidly at a rate of 10% for a long time, reaching about three times the global average growth rate during the same period, and has achieved world-renowned achievements. However, the exorbitant consumption of resources and the increasingly severe environmental pollution caused by the long-term extensive economic growth model no longer meet the actual needs of sustained and healthy economic progress and the comprehensive construction of a modern socialist country in the future. In recent years, the green economic progress model has gradually become a new economic development model of social concern, and its core is the improvement of green economic efficiency (Referred to as GEE in the following text). The report of the 19th National Congress of the Communist Party of China comprehensively elaborated on the strategic deployment of accelerating the reform of ecological civilization system, advancing green development and constructing a beautiful China, which shows that the green economic development model has become an important content of the government's attention, and the progress of GEE cannot be delayed.

GEE not only analyzes the utilization of elements in the production process from the perspective of traditional economic efficiency, but also comprehensively considers economic growth, resource utilization and environmental improvement, and is an improvement to traditional economic efficiency. In terms of researches on GEE, domestic and foreign scholars have gradually paid attention to the issues of GEE, and have developed useful researches on the definition, measurement, and influencing factors of GEE. Among them, the measurement of GEE is the basis of researches. Many scholars have conducted in-depth explorations on the basis of non-parametric envelope analysis, and developed different models to calculate GEE, including BCC, SBM-DEA, SUPER-SBM, two-stage DEA, three-stage DEA, four-stage DEA, DEA-Malmquist model and Malmquist-Luenberger index model, etc. The method evaluates the GEE at the regional, city and industry levels. At the same time, many useful research conclusions have been drawn based on these research methods. From the time dimension of the researches on the changes of GEE, most studies believe that China's GEE is on the rise, but it is accompanied by

certain fluctuations [1-2]. From the spatial dimension of the researches on the changes of GEE, the researches generally believe that there are spatial differences in China's GEE, that is, showing a decreasing pattern of changes in the east, middle, and west [3-6]. So, what are the influencing factors that affect GEE? How to improve China's GEE? Therefore, this article focuses on measures to improve GEE, so as to provide decision-making reference for government departments to accurately formulate and improve the policy system to achieve green economic development.

2. The Influencing Factors of GEE

Liu et al. [1] found that the contribution coefficient of economic progress level to GEE was 0.0668, that is, for every 1% increase in per capita GDP, the GEE increased by 0.0668%. This shows that China is still in a stage where the GEE is rising with economic growth. It is not difficult to explain that provinces with a high level of economic development have gradually shifted their development mode to an intensive development mode, and invested more in environmental protection, thus contributing to the improvement of GEE.

Hu et al. [6] discussed the impact of foreign direct investment, high-tech industry agglomeration, urbanization level, environmental regulation and other factors on GEE by building a dynamic panel data model. The study found that foreign direct investment significantly inhibited GEE and green scale efficiency, and promoted green pure technological efficiency. Since the reform and opening up, various provinces and cities have actively introduced foreign investment. On the one hand, FDI has not only expanded the scale of local production, but also brought advanced production technology and management experience. On the other hand, most of the capital introduced has been invested in energy-intensive and highly polluting industries. The large influx of FDI in the industry has also caused serious pollution to the local environment.

Qian et al. [4] proposed a non-parametric conditional efficiency model of green economy considering resource and environmental constraints based on environmental regulation, and then used this model to verify the effect of macro-environmental regulation on GEE and regional differences. The results show that the impact of environmental regulation on GEE is not only 'time lag' but also 'non-linear'. At present, pollution control task is mainly carried out by government departments. The government mainly controls environmental pollution by increasing fiscal environmental protection expenditures, which is presenting a trend of continuous expansion. However, the government currently has problems such as single investment channels and insufficient funds for environmental protection in environmental protection investment.

Qian et al. [3] believed that in terms of structural factors, the impact of industrial structure on GEE was remarkably negative, that is, the increase in the proportion of secondary industry will hinder the improvement of GEE. With the acceleration of China's industrialization process, the secondary industry in most provinces and cities, especially the heavy industry, is in a stage of rapid growth, and energy-intensive industries account for a relatively large proportion. This has resulted in a consistently high intensity of energy consumption and environmental pollution, and therefore has a significant impact on GEE. It can be seen that the current level of China's overall industry is relatively low, and it is necessary to reasonably control the scale of secondary industry, vigorously expand the tertiary industry, and promote the upgrading of traditional industries to modern service industries.

Liu et al. [1] believed that energy intensity was significantly negative for the improvement of GEE. At present, fossil energy accounts for a large proportion of the energy consumption structure of various provinces in China. In particular, the proportion of coal consumption in the primary energy structure is too large. This leads energy consumption to not only promotes

economic growth but also pay a large amount of ecological cost, which greatly restricts the improvement of GEE. Since the reform and opening up, China has always used fossil energy as the main type of consumption, and coal consumption has always accounted for a large proportion of total energy consumption. The continuous consumption of coal resources has further increased carbon emissions, and the damage to the natural ecological environment is increasing.

Fang et al. [7] used the vector autoregressive method of panel data and spatial econometrics to analyze the impact of new urbanization on GEE from two dimensions of time and space. The research results showed that the direct effect of new urbanization construction on GEE was not significant. Although the construction of new urbanization has no significant effect on the improvement of GEE of the province, it can significantly promote the improvement of GEE of neighboring provinces. This shows that various regions have problems that hinder the improvement of GEE in the process of promoting new urbanization.

3. Promotion Strategy of GEE

Based on the basic national conditions, this paper considers the different effects of factors such as economic development, foreign direct investment (FDI), energy structure, industrial structure, environmental regulations, new urbanization construction and other factors on GEE, so as to create a good environment conducive to the progress of regional green economy. Specifically, the main policy recommendations are as follows:

(1) Transform the mode of economic improvement. Speeding up the transformation of economic improvement mode is an inevitable requirement for China to achieve sustainable development. China must abandon the development mode of purely pursuing economic quantity and sacrificing the environment and social harmony, and transform to green economy as soon as possible. This is the basic requirement for accelerating the improvement of GEE. At present and for a period of time in the future, our country must further promote the following aspects: deepening the reform of the investment system and optimizing the allocation of resources, speeding up the reform of technological system and raising the level of independent innovation, promoting the construction of environmental resources system and improving the ability of sustainable development, deepening the reform of fiscal, taxation and financial systems, and optimizing the system and policy environment.

(2) Optimize the energy consumption structure. There have been problems such as low energy utilization rate and unscientific energy consumption structure in my country for a long time, which are also the underlying reasons for the poor effect of environmental pollution control. Therefore, China must focus on green and low-carbon transition, deepen structural reforms on the energy supply side, and achieve simultaneous improvements in quality and quantity. At the same time, further improve the consumption guarantee mechanism and monitoring and early warning platform, further strengthen the planning and construction of energy storage peak shaving facilities, and further optimize the energy consumption structure. In addition, increase the proportion of clean energy consumption including natural gas, hydropower, nuclear power and wind power etc.

(3) Improve the level of foreign investment introduction. Foreign direct investment had a significant negative effect on China's GEE. For this reason, China must pay attention to the transformation of assessment methods and the introduction of standards and requirements. Increasing the supervision and inspection of the work of attracting foreign investment, including examining the actual investors of the project, the influence of the project, and the gold content of the project. At the same time, paying attention to key points such as technology and intellectual property rights of foreign investment projects to improve the quality and level of foreign investment work. In addition, in view of the 'pollution paradise' that may be caused by

international trade, China should Restrict the export of products with high pollution, high energy consumption, and high emissions and increase the export proportion of high-tech products such as low pollution and low energy consumption.

(4) Accelerate the adjustment of industrial structure. The adjustment and optimization of industrial structure is the key to promoting the development of GEE. China must improve and transform the secondary industry, actively develop the tertiary industry, and promote the continuous development of the three-industry structure in the direction of optimization and upgrading. On the one hand, promote the transformation of the industrial economic structure from a low-tech, highly labor-intensive, and single-category structure to a labor-intensive, technology-intensive, and comprehensive development pattern. On the other hand, accelerate the development of real estate, information consulting, finance, insurance, and a large number of modern service industries such as e-commerce and modern logistics have been adapted to the needs of urbanization, informatization, industrialization, and globalization.

(5) Promote the coordinated development of regional new urbanization construction. On the one hand, improve the level of planning, enhance the scientificity and authority of urban planning, accelerate the construction of new types of cities such as green cities, smart cities, and cultural cities, and comprehensively improve the inherent quality of the city. On the other hand, in the process of advancing the construction of a new type of urbanization, multiple locations should be linked and coordinated to develop, and interaction and exchanges between regions should be strengthened, so as to give full play to the role of the new type of urbanization in promoting GEE.

4. Conclusion

Based on the analysis of the influencing factors of GEE, this article discusses countermeasures and suggestions to improve GEE. The research results show that the level of economic development has a significant role in promoting GEE in the long run. Foreign direct investment significantly inhibits GEE and green scale efficiency, while promoting green pure technological efficiency. Environmental regulation can promote the improvement of GEE in the long term, but its influence has different effects in different periods. The impact of industrial structure and energy intensity on GEE is significantly negative. The direct impact of new urbanization on GEE is not significant, but it has a significant role in promoting GEE in neighboring areas. To this end, the countermeasures proposed in this article include: transforming the economic development mode and accelerating the transition to green economy, Optimizing the structure of energy consumption and promoting the utilization of clean capacity, improving the level of foreign capital introduction and reducing the negative effects of foreign capital introduction, accelerating the adjustment of industrial structure and optimizing the spatial layout of industrial structure, promoting the construction of new urbanization and improving regional exchanges and cooperation. In addition, this work is supported by General Project of Natural Science Research of Colleges and Universities of Jiangsu Province (20KJB630015).

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