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Industrial Agglomeration and Resource Environment Analysis - Empirical Discussion from Chinese Cities

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Abstract: Due to the complexity and dispersion of environmental issues, directly defining their property rights cannot truly solve environmental quality problems. This article proposes an indirect solution to the industrialization of environmental resources and elaborates on the specific content and external guarantee policies of the industrialization of environmental resources. This article uses a game model and its extended analysis to indicate that the source of resource-based industrial clusters is the result of the comprehensive effect of regional effects and agglomeration effects. The formation of resource-based industrial clusters is influenced by transportation costs, final product demand functions, regional effects, agglomeration effects, and the gap in agglomeration effects between two regions.

Keywords: Industrial Agglomeration, Resource Environment, Empirical Discussion

1. INTRODUCTION

With the development of the economy, people have paid a heavy price for resources and environment. People are increasingly realizing that the losses or benefits of a country or individual are often not determined by their own actions. From a macro perspective, the annual increase in the area of the ozone hole is as large as that of the mainland United States. Although the destruction of the ozone layer is largely attributed to developed countries, both developing and developed countries face the same threat. From a micro perspective, the owners of downstream reservoirs did not engage in any destructive activities against the reservoirs, but only suffered economic losses due to the extensive deforestation of the upstream forests.

The losses caused by environmental pollution and destruction to the region, neighboring areas, and the world, as well as to modern and future generations, all reflect a commonality, which is an external spillover effect outside the market. These heterogeneous element endowments include natural factors, geographical location, market conditions, cultural customs, etc., which are an immovable and distinct set of elements in a certain region from other regions. However, the advantage of natural resources can only explain about 20% of the phenomenon of industrial agglomeration. In addition to regional factors, there are other factors that promote the formation of resource-based industrial agglomeration. Therefore, we refer to these other factors as "agglomeration factors". The agglomeration factor mainly emphasizes the economies of scale generated by the spatial agglomeration of production factors and the endogenous comparative advantage caused by increasing returns, which are also important reasons for industrial agglomeration.

The development of the digital economy has gradually evolved from digital technology to digital industries. Therefore, exploring how the aggregation of digital industries in China affects total factor productivity is of certain value and significance for achieving industrial structure optimization and upgrading, improving resource allocation efficiency, and better leveraging the driving force of technological innovation represented by internet technology, thereby assisting sustainable economic growth in China.

Industrial agglomeration promotes the optimization of resource allocation and thus improves TFP mainly in the following ways: firstly, specialization of division of labor, where enterprises in the same industry form clusters within a certain geographical space range. Enterprises can continuously improve through mutual communication and learning, making the industries within the cluster range more specialized, improving collaboration efficiency between enterprises, generating external effects, and promoting productivity improvement; The second is the improvement of infrastructure level. Urban infrastructure such as transportation and communication are crucial for the normal operation of enterprises. At the same time, the formation of gathering areas will also encourage local governments to increase investment in public infrastructure, provide more public goods and services, and help enterprises effectively reduce production costs and improve production efficiency. In environmental issues, due to the widespread existence of externalities, in practice, it is difficult to concentrate all relevant parties within the market scope. In most environmental management practices, such as the impact of pollution on public health and the loss of tourist rest landscapes, the number of people affected is often in the thousands, or even millions.

If, according to the procedure of property rights approach, all affected individuals need to be gathered together and asked for compensation or willingness to pay based on the ownership or non-ownership of property rights, then the cost of this approach is considerable and often difficult to implement. Moreover, there are always some people who want to take advantage of the diffuse nature of the environment to share the benefits or escape from others purchasing clean environments.

2. THE PROPOSED METHODOLOGY

2.1 Analysis on the Characteristics of my country's Resource-Based Industrial Clusters

Due to reliance on resources, exploration and extraction cannot be carried out without resources, so resource extraction enterprises generally gather in resource producing areas; However, resource processing and sales enterprises face the problem of location selection. They may gather in resource producing areas or non-resource producing areas. Therefore, for resource-based industries, there are two types of

agglomeration: one is traditional industrial clusters, where resource extraction enterprises and processing enterprises form an agglomeration situation in areas with resource endowments. Environmental resource industries refer to those specialized in the protection, governance, and restoration of environmental resources the industrial sector responsible for regeneration, renewal, value-added, and accumulation mainly includes soil improvement, restoration of arable land, seed harvesting and afforestation, aerial seeding and grass cultivation, protection and breeding of endangered wild animals, aquatic seedling cultivation, water conservancy, wastewater and waste gas purification, and protection of various resources.

The process of environmental resource industrialization includes three stages: basic research, diffusion, and infiltration of environmental resources. Basic research on environmental resources refers to activities such as the protection and governance of environmental resources; Diffusion refers to the commercialization of environmental resource protection and governance; Infiltration refers to the correlation and interdependence between the environmental resource industry and other industrial economies, leading to the gradual upgrading of the environmental resource industry. Using a continuous space function to describe industrial agglomeration, constructing indicators from the perspective of distance, effectively avoiding boundary problems, and meeting the five conditions recognized by academia for measuring industrial agglomeration, including the ability to compare between industries the overall clustering degree of the industry can be controlled, the size distribution of enterprises can be controlled, the MAUP effect can be avoided, and the estimated value can be tested for significance. From this, the DO index is currently an ideal tool for studying the agglomeration of industries crossing boundaries. Due to the uneven distribution of resources and the high transportation costs of natural resource products, the formation of resource-based industrial clusters in China generally has strong geographical rootedness.

China's mineral resources are mainly distributed in the western region, which has a complex geographical environment and outdated transportation facilities, making it impossible to adopt a long-distance commuting mining development mode like Canada. Therefore, China generally establishes industrial clusters in ore forming areas and develops them into mining communities and small towns.

Since most of China's mineral deposits are small and medium-sized, with limited reserves and mostly lean minerals, this also restricts the scale and development prospects of China's resource-based industrial clusters. Many resource-based small towns in China have become very sluggish after resource depletion, leaving behind a series of social problems such as unemployment, environmental pollution, and economic recession among residents. To truly achieve the industrialization of environmental resources, it is necessary to protect and renovate environmental resources, turn them into tourism resources, and then drive the development of the commercial industry. Through comprehensive tourism, the problem of clarifying the property rights of public environmental resources can be solved, achieving the trinity of ecology, tourism, and commerce, and common development. A beautiful and clean environment can bring many advantages to the local economic development. The development of the tourism industry not only brings huge economic benefits to the region, but also greatly stimulates the development of the local tertiary industry through tourists' shopping consumption.

2.2 The relationship between resource-based industry agglomeration and resource environment

According to a research report by the World Tourism Association, in 1994, the world's tourism industry accounted for 1/10 of the world's gross domestic product, and one out of every nine job opportunities worldwide came from the tourism industry. The aggregation degree of the cultural, sports, and entertainment industries, as well as the wholesale and retail industries, has basically stabilized, while the aggregation degree of the manufacturing industry, information transmission, software, and information technology service industries has shown an overall upward trend, which is basically the same as the current situation in China. The development of Internet information technology in the wholesale and retail industries, as well as the cultural, sports, and entertainment industries, has formed a certain scale and is becoming mature. However, there is still significant room for development in the construction of digital infrastructure related to manufacturing, information transmission, software, and information technology services. This further indicates that the continuous development of the Internet and corresponding emerging technologies has promoted the deepening of the aggregation of digital industries.

The structure of China's resource-based industrial clusters is single, and the simple supply chain form has replaced the network and complementary characteristics of general clusters, demonstrating strong professionalism. The members within a cluster are more characterized by linear relationships based on natural resource supply, without demonstrating the network advantages of the cluster. There is a lack of knowledge exchange and spillover among members within the cluster, and the entire system tends to become rigid and closed. In addition, the Chinese government has strong intervention in resource-based industrial clusters. Many resource-based industrial clusters are generated under the government's layout, lacking market mechanism guidance and flexibility for independent development, exhibiting "government failure".

Within a cluster, state-owned large enterprises often play a core role, monopolizing the entire industry and making it difficult to fully leverage the advantages of the cluster. There are two types of agglomeration methods for resource-based industries mentioned in the previous text: one is the usual industrial agglomeration method, where all upstream and downstream enterprises of resource-based industries gather in resource-based region A; Another approach is industrial agglomeration under the "zero resource economy", where upstream resource extraction enterprises gather in location A and downstream resource processing enterprises gather in location B to produce by purchasing raw materials from location A. To compare the impact of these two agglomeration methods.

3. CONCLUSION

Accurately evaluate and calculate the stock, structure, value, and potential of natural resources based on value theory and socio-economic laws. Only through reasonable resource accounting can resource property rights be clearly defined, and efficient utilization and industrial management of resources be achieved. From the game analysis above, the formation of resource-based industrial agglomeration is the

result of the comprehensive effect of regional effects and agglomeration effects. In addition, the agglomeration of resource-based industries is also influenced by the transportation costs of raw materials and products, as well as the differences in agglomeration effects between the two regions. To form a resource-based industrial agglomeration form, it is necessary to comprehensively consider the influence and constraints of these factors.

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