

Study on the Construction of Ecological Corridor of Yangtze River Economic Belt (Anhui Section)

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Abstract: The Yangtze River Economic Belt is one of the regions with the most active economic vitality. Meanwhile, the requirement of ecological and environmental protection in this region should match the strength of economic development. Based on the panel data of five cities along the Yangtze River in Anhui Province from 2010 to 2020, this paper empirically-studied the influence of regional economic development level on the construction of ecological corridor. The research found that: due to the Kuznets curve of the environment, with the continuous economic development of the study area, it has a great damage to the ecological environment, which is not conducive to the construction of ecological corridor. On the other hand, the adjustment and optimization of industrial structure will lead to efficient production of polluting enterprises and reduce pollutant emissions, which is conducive to the construction of ecological corridor. Finally, under the principle of ecological priority and green development, the author puts forward some suggestions on the construction of ecological corridor.

Keywords: The Yangtze River Economic Belt, Ecological corridor construction, Green development.

1. Introduction

The Yangtze River Economic Belt covers 11 provinces and cities, including Shanghai, Jiangsu, Zhejiang, Anhui, Jiangxi, Hubei, Hunan, Chongqing, Sichuan, Yunnan and Guizhou. It is one of the three major strategies implemented by the central government. It covers an area of 2.05 million square kilometers, accounting for 21.4 percent of China's total population and over 40 percent of China's total regional GDP. After being promoted as a national strategy, the Yangtze River Economic Belt plays an increasingly prominent strategic role. It is not only an inland river economic belt with global influence, a coordinated development belt of interaction and cooperation between the East and the West, a belt of opening up to the outside world along the coast and the river and the border, but also a pilot demonstration belt for ecological civilization construction.

The region along the river of Anhui province is in the transition zone between warm temperate zone and subtropical zone, belonging to the subtropical humid monsoon climate, monsoon is obvious, four distinct seasons, the annual average precipitation is 773-1670 mm. The Yangtze River flows from Anqing to Anhui, passing through Chizhou, Tongling, Wuhu and Maanshan, traversing central and southern Anhui, with a total length of 416 kilometers in Anhui. In recent years, the national and people's awareness of environmental protection has gradually increased. The Yangtze River has not only brought wealth to the people of Anhui, but also been protected by the local government. At the 11th Anhui Provincial Congress of the Communist Party of China, it was clearly pointed out that, first, carbon neutrality should be promoted; second, ecological system protection and restoration should be promoted; third, ecological and environmental quality should be managed and improved. The construction of ecological corridor along the river is an effective solution. From the perspective of ecology, the ecological corridor mainly refers to the corridor with ecological service functions such as protecting biodiversity, filtering pollutants, preventing soil and water loss, preventing wind and fixing sand, and regulating flood. It is mainly composed of

ecological structural elements such as vegetation, water body and soil. From the perspective of economics, the construction of ecological corridor is conducive to the improvement of ecological environment, and more importantly, it can actively adjust the structure of green industry and drive the development of regional green economy, especially the development of forestry economy. Therefore, the construction of the ecological corridor of the Yangtze River Economic Belt (Anhui section) is to protect the ecological economy of the Yangtze River and enrich the species diversity of the Yangtze River basin. It is also to create a new name card of Anhui, to provide Anhui experience and contribute to the construction of ecological civilization.

2. Literature References

The construction of ecological corridor is an important part of the protection of ecological environment, but also one of the effective ways to improve the ecological environment. Since the 18th CPC National Congress, with the continuous progress of the "five-in-one" overall layout, historical changes have taken place in the process of ecological civilization construction and ecological environment governance from recognition to practice. Relevant ecological protection policies have been gradually implemented, and relevant scholars have gradually increased their research on such topics as ecological civilization construction and green development. After the successful convening of the 20th National Congress of the People's Republic of China, there were new requirements on environmental protection, emphasizing the need to accelerate the green transformation of the development mode and further promote the prevention and control of environmental pollution. Most of the previous studies measured the level of green development. Zhao Ao et al. (2018)[1] used entropy-Topsis method to evaluate the level of green development in China, and pointed out that reducing the pressure of ecological environment should start with controlling the scale and quantity of the development of petrochemical industry, and reduce the emission of pollutants in heavy chemical industry. CAI Shaohong et al. (2021)[2] and Liang Gang (2021)[3] respectively measured the green

development level of the Yangtze River Economic Belt and the green and low-carbon development level of China. These studies only measure the level of green development without further analysis of the ecological environment.

Later, some scholars studied the construction of ecological corridor qualitatively. He Yi (2017)[4] took Nanlei River Basin in Menglian County, Yunnan Province as an example, pointed out that mountain building and water management are important approaches to ecological construction, and innovatively proposed that the construction of green corridor should be divided into three parts. They are "upstream ecological protection area", "forest city ecological construction area" and "middle and downstream ecological industry development area". Among them, the forest urban ecological construction zone integrates the natural landscape on both sides of the river with the urban construction, and constructs "riverside park", "wetland park" and other types of banded parks. The upstream ecological reserve should implement strict protection measures to reduce the pollution of the water source caused by human activities; The middle and lower reaches ecological industry development area can carry on the appropriate industrial development. Zhou Pinghua (2021)[5] takes Wangjiang County, Anhui Province as an example and points out that there are problems such as illegal factory buildings and abandoned docks along the river in this county, and the green corridor also shows the phenomenon of broken zone. The construction of the ecological corridor needs to remove the illegal buildings and restore the green, and insert the green in the cracks. From the perspective of biodiversity, Chen Hongbo (2020)[6] argues that it has both resource attributes, environmental guarantee attributes and ecological security attributes, and can effectively realize the coordinated promotion of the two themes of ecological priority and green development in the Yangtze River Economic Belt. In terms of the construction of green ecological corridor in the Yangtze River Economic Belt, Chen Xin (2020)[7] theoretically points out that harmonious coexistence between man and nature should be adhered to, government leadership and social participation should be adhered to, and all social forces should be encouraged and guided to participate in afforestation.

Based on this, most of the current studies on the construction of ecological corridor in the academic circle give corresponding construction measures in a qualitative way, and most of them focus on the construction of ecological corridor in cities, such as Dasha River Ecological corridor in Shenzhen. There are few literatures on the implementation of cross-city and county-level ecological corridor construction in the Yangtze River basin. The paper tries to find out the main influencing factors of the construction of ecological corridor by constructing an econometric model, and puts forward relevant construction suggestions by means of quantitative plus qualitative method.

3. Mechanism Analysis

The development of the Yangtze River Economic Belt has become one of the major national development strategies. With the continuous and rapid economic development of the Yangtze River Basin in recent years, the requirements for the ecological environment of various regions are also increasing day by day. In order to realize the transformation from the original extensive development mode to the intensive economic high-quality development mode, the basic

requirements of ecological priority and green development must be met. At the same time, in order to achieve the purpose of protecting the ecology of the Yangtze River, it is particularly important to protect the ecological environment in the region along the Yangtze River, and the construction of ecological corridor has become a development trend of protecting the Yangtze River basin.

The transformation of economic development mode is conducive to the construction of ecological corridor. At present, the economic development model of our country has changed from extensive model to intensive model, and is gradually on the road of high quality development and green development. The extensive development model originally implemented is the development model at the cost of sacrificing environment and the low development efficiency, under the development background and requirements faced at that time, in order to first lay a solid economic foundation, introduce many high pollution and high energy consumption industrial enterprises from foreign countries, this is bound to cause a great threat to the protection of the ecological environment in our country. With the rapid economic and social development of the Yangtze River Economic Belt, people realize that the ecological environment is the basis of human survival, and put forward higher requirements for the protection of the ecological environment. Under the mode of high-quality economic development, the organic coordination and joint promotion of economic development and ecological environment is the concrete embodiment of green development, and also a further confirmation of the Kuznets curve of environment. High-quality development is conducive to improving the development level of regional economy and ensuring the effective protection of ecological environment, which is conducive to the construction of the Yangtze River Basin ecological corridor.

The optimization and adjustment of industrial structure is conducive to the construction of ecological corridor. The adjustment and optimization of industrial structure has always been the eternal theme of economic development, and the irrational industrial structure will also have a negative impact on the ecological environment. Since China's economic level was still backward in the early stage of reform and opening up, many foreign industrial enterprises with high pollution and high energy consumption were introduced in attracting investment. For the Yangtze River Delta, one of the regions with the strongest economic vitality, a large number of foreign capital was attracted, which led to adequate economic development around the Yangtze River Economic Belt. But at the same time is accompanied by the unreasonable industrial structure and serious environmental pollution. A large number of polluting enterprises directly discharge industrial wastewater, waste gas and solid waste into nature, resulting in the surrounding waters, air and land are polluted to varying degrees. Therefore, it is necessary to speed up the optimization and adjustment of the industrial structure in the Yangtze River Basin, change the development mode of industrial enterprises, and advocate energy conservation and emission reduction and green development.

The improvement of environmental governance level is conducive to the construction of ecological corridor. Protecting the ecological environment is a necessary condition for maintaining sustainable development. However, the capital input of the civil society to the ecological environment is not enough to cover the pollution loss caused

by the substantial improvement of the economic level. In this case, it is necessary for the government to actively intervene and increase the financial expenditure on environmental protection. To attract more private capital into environmental protection industry by government behavior, promote the self-sufficiency and sustainable development of environmental protection industry. Therefore, the government's investment in environmental protection is also one of the important factors affecting the construction of ecological corridor.

The implementation of green development concept is conducive to the construction of ecological corridor. The five major development concepts put forward in the national development plan include the concept of green development, which is also the basic strategy to guide our economic and social development in the coming period. In the report to the 19th National Congress of the Communist Party of China, the positive significance of green development has been greatly expounded, and the conclusion that "lucid waters and lush mountains are gold and silver mountains" was put forward. The concept of green development not only affects economic development, but also has a positive impact on environmental protection, and enhances the public's awareness of environmental protection. In particular, it can increase the attention to the intensive use of resources and environmental governance and other issues. Therefore, the implementation of the concept of green development is also conducive to the construction of ecological corridor.

4. Research Design

4.1. Model construction

This paper mainly attempts to study the construction of ecological corridor from the perspective of economics, so economic variables are taken as the core explanatory variables. Based on the theoretical analysis above and the existing research of many scholars, this paper will adopt the two-way fixed effect model to analyze the data, that is, both the individual effect and the time effect are fixed. The following econometric model is constructed by using the relevant data of cities along the Yangtze River in Anhui Province from 2010 to 2020 to empirically test the study on the influence of regional economic development on the ecological corridor effect.

$$STCL_{it} = \alpha + \beta * PGDP_{it} + CONTROL_{it} + \varepsilon_{it}$$

In the above equation, $STCL_{it}$ is the index of ecological corridor construction, $PGDP_{it}$ is the core explanatory

variable of gross regional product per capita, $CONTROL_{it}$ is the control variable, α is the intercept term of the model, β is the estimated parameter of the model, ε is the random disturbance term, subscripts i and t are individual and time, respectively.

4.2. Variable setting

The explained variable (ecological corridor construction index), considering the availability of development data of five cities along the Yangtze River in Anhui Province, this paper takes the area of afforestation, forest coverage, park green area, forest land area, live wood storage and total water resources as positive indicators, and takes the total amount of industrial "three wastes" discharge and pollution control costs as negative indicators. The entropy method was used to reduce the dimension of all indicators and construct the ecological corridor construction index, which was expressed by STCL. Core explanatory variable (per capita gross regional product). Taking per capita gross regional product as the core explanatory variable, this paper explores the impact of regional economic development on the construction of ecological corridor, and can also verify the Kuznets curve of the environment from the side. Control variables. This paper introduces the proportion of the output value of the secondary industry, the fiscal expenditure on energy conservation and environmental protection, the proportion of foreign direct investment in the gross regional product and the urbanization rate, which are expressed by industry, expend, fdi and urban respectively. The optimization of industrial structure can improve the production efficiency of enterprises and reduce the emission of polluting enterprises. The fiscal expenditure on energy conservation and environmental protection represents the government's support for environmental protection and its determination to control pollution. The urbanization rate is represented by the ratio of non-agricultural population to total population.

4.3. Data description

The empirical data of this paper is the panel data of five cities along the Yangtze River in Anhui section of the Yangtze River Economic Belt from 2010 to 2020, with a total of 55 observed values. The data used in this paper came from Anhui Statistical Yearbook, National Statistical Yearbook and statistical yearbooks of various cities. Some missing data were supplemented by linear interpolation method. The descriptive statistical results of variables are shown in Table 1.

Table 1. Descriptive statistics of variables

Variable	Obs	Mean	Std.Dev.	Min	Max
STCL	55	.454	.296	.037	.854
PGDP	55	0	1	-1.735	2.019
industry	55	.481	.104	.343	.697
expend	55	.006	.003	.002	.015
fdi	55	.033	.032	0	.216
urban	55	.391	.132	.178	.587

After dimensionality reduction by entropy weight method, the ecological corridor construction index STCL forms an index ranging from 0 to 1. The per capita gross regional product (GDP) is standardized. The remaining control variables are in the form of percentage, and no additional data processing is required.

5. Empirical Analysis

In order to empirically investigate the impact of regional economic development on the construction of ecological corridor and avoid the differentiated impact of individual effect and time effect, the bidirectional fixed effect model is

applied in this paper, and the control variables are gradually added into the main model for regression. The estimated

results of the model are shown in Table 2.

Table 2. Model estimation result

MODEL VARIABLES	(1) STCL	(2) STCL	(3) STCL	(4) STCL
PGDP	-0.0343*** (0.0118)	-0.0333*** (0.0120)	-0.0349*** (0.0121)	-0.0349* (0.0189)
industry	0.255* (0.130)	0.205 (0.147)	0.220 (0.148)	0.220 (0.151)
expend		1.974 (2.705)	2.599 (2.765)	2.608 (3.324)
fdi			0.199 (0.189)	0.199 (0.193)
urban				-0.000749 (0.147)
Constant	0.616*** (0.0724)	0.636*** (0.0778)	0.624*** (0.0785)	0.624*** (0.0937)
Observations	55	55	55	55
R-squared	0.992	0.992	0.992	0.992

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In Table 2, the coefficients of per capita gross regional product (PGDP), the core explanatory variable, are all significant and show an obvious negative effect, indicating that the better the economic development status of a region, the negative impact on the construction of the ecological corridor. As can be seen from the Kuznets curve of inverted U-shaped environment, the continuous development of regional economy has caused great damage to the ecological environment at the beginning, making it difficult to effectively construct the ecological corridor. When the regional economic level reaches a certain height and exceeds a certain threshold, the damage to the ecological environment will be reduced, which is further conducive to the construction of the ecological corridor. According to the data collected in this paper, the economic development of the current study area is still in the stage of negative impact on the construction of ecological corridor, and there is still a distance from the threshold of economic development. It is an effective way to achieve environment-friendly and high-quality development to transform the economic development mode from extensive development to intensive development. Specifically, in each model, after adding the control variable industrial structure in model (1), this coefficient has a significant positive impact on the construction of the ecological corridor, indicating that the optimization of industrial structure is conducive to improving the ecological index. From the above theory, with the continuous optimization of industrial structure, the production efficiency and operating costs of enterprises have been significantly improved, reducing the emission of pollutants, and thus improving the ecological index. In the following models (2), (3) and (4), the remaining control variables are added successively: fiscal expenditure on energy conservation and environmental protection, proportion of direct foreign investment and urbanization rate. According to the estimation results of the model, the effect of per capita GDP is always significant, and after the introduction of control variables in turn, there is almost no difference in the negative effect and size, which indicates that the estimation results of the model are robust. Although the effect of control variables is not

significant after the introduction of control variables, it still presents a positive influence. The greater the fiscal expenditure on energy conservation and environmental protection, the greater the government's efforts on environmental protection will be, which will be conducive to the construction of the ecological corridor. The increase of urbanization rate has a negative impact on the ecological index, indicating that part of the ecological environment will be destroyed during the accelerated urbanization process, which is not conducive to the construction of ecological corridor.

6. Conclusion and Suggestion

This paper takes five cities along the Yangtze River Economic Belt in Anhui Province as the object of investigation, and focuses on constructing the construction index of the regional ecological corridor along the Yangtze River. Based on the theoretical analysis of factors affecting the construction of the ecological corridor, based on the panel data of five cities along the Yangtze River in Anhui from 2010 to 2020, the paper explores the impact of regional economic development level on the construction of the ecological corridor, and the main conclusions are as follows:

From the analysis of the whole sample, the development level of regional economy has a negative effect on the construction of ecological corridor, that is, with the continuous development of regional economy, it will increase the difficulty of the construction of ecological corridor. Regional economic development level will initially have a negative impact on the environment. Due to the need for regional economic development, some heavy industries with high pollution and high energy consumption have to be introduced to promote regional employment. However, due to the characteristics of the Kuznets curve of the environment, when the economic development level reaches or exceeds a certain threshold, a higher level of economic development can improve the production efficiency of enterprises. Reduce pollution emission and have a positive impact on the construction of ecological corridor.

With the continuous introduction of control variables in the model, the optimization of industrial structure initially plays a positive role in the construction of the ecological corridor, that is, the continuous optimization and upgrading of regional industrial structure can improve the level of green development of the industry and reduce the emission of industrial pollutants, which is conducive to the construction of the ecological corridor. At the same time, the government's financial expenditure on environmental governance also has a certain positive effect on the construction of ecological corridor. Foreign direct investment improves the production efficiency of enterprises and reduces pollution emission, which has the same positive effect as government fiscal expenditure. The accelerating process of urbanization will cause certain damage to the ecological environment, which is not conducive to the construction of ecological corridor.

Based on theoretical analysis and empirical research, this paper puts forward the following policy recommendations:

Give play to the positive effect of regional economic development level on the construction of ecological corridor. Economic development and ecological environmental protection have always been the focus of scholars. In the existing literature, most of them have verified the Kuznets curve theory of environment. They believe that economic development will have a negative impact on the ecological environment at the beginning, and with the continuous development of economy, the requirements for the ecological environment are increasingly high. High economic level will also turn negative effects into positive ones, and ultimately achieve the goal of high-quality economic development and ecological protection.

We will accelerate the adjustment and upgrading of industrial structure and raise the production efficiency of enterprises. The continuous optimization and upgrading of industrial structure can effectively enhance the core competitiveness of industrial development. In order to achieve the goal of high-quality economic development, the existing industrial enterprises with high pollution and high energy consumption must speed up the transformation process of production mode, reduce the emissions of industrial "three wastes", improve the production efficiency of enterprises, and follow the theory of ecological priority and green development.

We will increase government support for energy conservation and environmental protection, increase fiscal spending on environmental protection, and further improve

the environmental regulatory system. The construction of the ecological corridor of the Yangtze River Economic Belt needs the intervention of government departments. The private sector is not strong in the investment intention of ecological and environmental protection, and needs the guidance of government funds. Further increase the fiscal expenditure on environmental protection, attract more private capital to the construction of the ecological corridor, and encourage private investment to join the capital investment in the construction of the Yangtze River ecological corridor. In addition, the construction of Anhui ecological corridor along the river involves five cities along the river, which also requires the participation of local governments to coordinate the cooperation of the cross-city ecological corridor construction.

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