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Measuring and Evaluating the Efficiency of Urban Ecology and Environment in Jiangsu Province

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Abstract

Eco-efficiency is related to the dual issues between economy and ecology. It must be ensured that the environmental impact is kept to a minimum while realizing the normal development of social economy. Taking 13 cities in Jiangsu Province as examples, the paper evaluates the efficiency of urban Ecology and environment and its influencing factors of each city in Jiangsu Province from 2009 to 2015 through the super-efficient DEA model and Tobit regression analysis. The research shows that: The eco-efficiency of each city is in the middle and upper level, and the regional differences are obvious. It is the highest in central Jiangsu and the worst in northern Jiangsu; the urbanization rate has a positive impact on the urban efficiency of urban Ecology and environment in Jiangsu, and the industrial structure has an inhibitory effect on the urban efficiency of urban Ecology and environment in Jiangsu. The impact on urban efficiency of urban Ecology and environment is not obvious.

Keywords: efficiency, urban ecology, environment, DEA

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INTRODUCTION

Since the reform and opening up more than 30 years ago, China's urbanization has entered a period of stable and rapid development. The number of cities and the size of cities have continued to increase. The urbanization rate has increased from 18.96% in 1979 to 58.52% in 2017. With the expansion of the city scale and the expansion of population, problems such as increased pollution, ecological deterioration, and inadequate construction of environmental protection facilities have also been brought about. Therefore, the "13th Five-Year Plan" points out that China needs to change the extensive economic growth model at the expense of environmental pollution in the past and truly embark on a sustainable development path that is coordinated with economic and social development and the environment. The "19th National Congress" clearly stated that building an ecological civilization is a millennium plan for the sustainable development of the Chinese nation. It is necessary to create more material and spiritual wealth to meet the growing needs of the people for a better life, and to provide more quality ecological products. Meet the people's growing beautiful ecological environment needs. Jiangsu Province, the nation's economically strong province, is the first province with three cities with GDP exceeding RMB 1 trillion. In recent years, Jiangsu Province has also achieved many problems in environmental pollution while achieving rapid economic growth. As early as 2010, Jiangsu Province put forward the goal plan of "building an eco-province by 2020". In 2013, the Party Central Committee put forward new requirements for the construction of ecological civilization in Jiangsu Province, emphasizing Jiangsu's exemplary role of "taking the lead, taking the lead, and prioritizing" in the country. In this context, assessing the level of efficiency of urban Ecology and environment in Jiangsu cities, analyzing the problems and influencing factors in economic development and environmental protection work, and proposing targeted recommendations are of great significance to Jiangsu's first realization of the goal of "ecological provinces".

LITERATURE REVIEW

The concept of efficiency of urban Ecology and environment was first proposed by Müller and Sturm (2001), ie, the ratio of increased value and increased environmental impact in economic activities is a practical method of expressing sustainable development capacity. In 1992, the World Business Council for

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Sustainable Development (WBCSD) proposed that efficiency of urban Ecology and environment is to meet the needs of humans and improve the quality of life by creating products and services with competitive advantages, while reducing the impact on the ecological environment and reducing resources. The consumption of energy in order to achieve the degree of resources and environment can be adapted to the level of the earth's carrying capacity, and achieve the goal of coordinated economic and environmental development. In 1998, the Organization for Economic Co-operation and Development of the World (OECD) proposed a broad concept of efficiency of urban Ecology and environment and extended it to the entire economic field such as government and industrial enterprises. It is believed that efficiency of urban Ecology and environment is an efficiency that meets human needs and uses ecological resources. The measure of the relationship. In 1999, the European Union's Environmental Agency (EFA) quantified sustainable development using the efficiency of urban Ecology and environment index and comprehensively considered economic, social, and environmental factors. Efficiency of urban Ecology and environment was defined as the ability to increase output levels with reduced resource input. Experts and scholars abroad also define ecological efficiency from different perspectives. Meier (1997) believes that the efficiency of efficiency of urban Ecology and environment is a summary of the interrelationship between the benefits of the system and the shortcomings caused by the system; Pan and He (2015) believes that efficiency of urban Ecology and environment refers to the destruction of the ecological environment and economic output during the production process. Ratio; Pan and He (2015) believes that efficiency of urban Ecology and environment is a ratio of the value of resource and environmental pressure increase to the value added of services and products. Pan and He (2015) define the efficiency of urban Ecology and environment based on the difference between the system's resource input and the resulting environmental impact. As the ratio of related costs (resources input) and environmental impact factors, Huppes et al. (2006) believes that efficiency of urban Ecology and environment is a method for analyzing sustainable development and is a relationship between the environmental costs of certain production activities and economic behavior.

Many scholars have studied the calculation methods and applications of ecological efficiency. Some scholars use the ratio of economic output value and environmental impact to evaluate ecological efficiency. Luo et al. (2013) draws on the marginal theory of neo-classical economics and argues that eco-efficiency can be interpreted as the ratio of output to the increase in environmental impact. Mao (2010) reversed the calculation formula of ecological efficiency and used the ratio of environmental impact and output value as the formula for calculating ecological efficiency. Evaluating efficiency of urban Ecology and environment by the formula method is simple and intuitive, and easy to operate. However, the measurement of input and output does not form a unified method. Helminen (2000) recommend using the net increase in the system (sales revenue minus the difference in various costs) as the measure of output. (Rudenauer and Gensch 2005) proposed that in the LCC calculation process, purchase costs, operating costs, disposal costs, maintenance and some investment costs should be taken into account. Some scholars also use eco-efficiency indicators to evaluate efficiency of urban Ecology and environment and efficiency of urban Ecology and environment as the overall efficiency of each input element of the system. (Dahlstrom 2005), in evaluating the efficiency of urban Ecology and environment of the UK steel and aluminum products industry, pointed out that efficiency of urban Ecology and environment was evaluated in terms of resource productivity, efficiency, and strength. Pan and He (2015) used the QFD method and life cycle assessment method to calculate the impact on the environment of vacuum cleaners and refrigerators. Data Envelopment (DEA) model is also one of the efficiency of urban Ecology and environment evaluation methods commonly used by scholars. Sarkis (2001) used six kinds of DEA models at the same time to measure the efficiency of urban Ecology and environment of 48 power production companies, and then compared the reasons for the different calculation results. Kuosmanen and Kortelainen (2008) used the pollutants as input indicators of the DEA model, and used two DEA models to measure the technical efficiency and environmental efficiency of the 24 power production enterprises in Europe. The product of these two kinds of efficiencies was used as an indicator to measure efficiency of urban Ecology and environment. Zhang et al. (2015) used environmental pressure indicators instead of pollutant production indicators as inputs for the DEA model, and analyzed the relative efficiency of urban Ecology and environment of road transport in the three towns in Finland.

In China, the study of efficiency of urban Ecology and environment started relatively late. Zhang et al. (2015) first introduced the concept of efficiency of urban Ecology and environment into China. Helminen (2000) introduced the concept of efficiency of urban Ecology and environment proposed by OECD into China's new environmental management approach. Zhang et al. (2015) believes that the efficiency of urban Ecology and environment can be measured by the ratio of input to output. Simple efficiency of urban Ecology and environment is defined as the impact of unit production consumption on the environment. Pan and He (2015) expressed efficiency of urban Ecology and environment as raw material consumption and pollutant emissions per unit of output. Chen (2008) evaluated the differences in regional efficiency of urban Ecology and environment in 29 provinces of China using factor analysis weighting methods. Zhang et al. (2015) believe that efficiency of urban Ecology and environment is the efficiency resulting from the effective use of resources and the reduction of environmental pressure in the process of regional economic development, and is an important indicator of the coordinated and sustainable development of the regional economy. Fu et al. (2013) used the super-efficient DEA method to measure the ecological efficiency of the "3+5" urban agglomeration in Changzhutan from the perspective of recycling economy, and quantitatively examined the influencing factors of the "urban agglomeration" ecological efficiency. Korhonen and Luptacik (2004) conducted an empirical analysis of the evolution of ecological efficiency and spatial pattern of urban construction land from 25 cities in Jiangsu, Zhejiang and Shanghai in 2009-2012. Helminen (2000) evaluated the economic efficiency and efficiency of urban Ecology and environment of the three time cross-sections of the four major urban agglomerations in the eastern coastal areas of China, and analyzed their temporal and spatial evolution characteristics. This paper selects a super-efficiency DEA model and uses 13 cities in Jiangsu Province as an example to analyze the changes in efficiency of urban Ecology and environment values and inter-city differences from 2009 to 2016, and to explore the main factors affecting the urban efficiency of urban Ecology and environment in order to enhance Jiangsu's cities. Efficiency of urban Ecology and environment provides a reference, but also provides experience for improving the efficiency of the national eco-city.

RESEARCH METHODS

Super-efficient DEA Model and Tobit Model

The DEA method studies the relative efficiency of the decision unit with multiple input variables and output variables. Through a comprehensive analysis of the input and output information, it determines which units are effective decision-making units, and proposes non-effective reasons and improvement methods for other decision-making units. When using the DEA method for efficiency evaluation, the decision unit is divided into two categories based on the efficiency value: the efficiency value is less than 1 and the DEA is invalid; the efficiency value is equal to 1, and the DEA is valid. When the traditional DEA method faces the decision-making unit whose efficiency value is 1, the multiple decision-making units are evaluated as valid, but it is impossible to implement the sort. The decision makers are most concerned with the ordering and evaluation of the decision unit. In order to solve this problem, Pan, He (2015) proposed a super-efficient DEA analysis method. When evaluating a decision unit, the model itself is not included in the evaluation reference set, so its efficiency value may be greater than 1. There are n decision units. Each decision unit DMU_j (j=1, 2... n) has m inputs and k outputs. The input matrix is $Xj=(x_{1j}, x_{2j}, ..., x_{mj})$ and the output matrix $Yj=(y_{1j},y_{2j}, \ldots, y_{kj})$. Therefore, the input-oriented super-efficiency DEA model has the following form:

1. Where θ is the relative efficiency of the input and output of the decision unit; λj is the decision variable; s+ and s- are slack variables. If $\theta \geq 1$, s+=s-=0, the decision unit DEA is valid; when $\theta \geq 1$, s+、s- is not zero, the decision unit is DEA weakly effective; when $\theta < 1$, the decision unit DEA is invalid. In order to measure the impact factors and the degree of impact of the super-efficiency DEA model's assessment of efficiency of urban Ecology and environment, the super-efficiency DEA model can be used to evaluate the ecological efficiency of the DMU. The efficiency of urban Ecology and environment is used as an explanatory variable, and various factors affecting the efficiency of urban Ecology and environment are used as explanatory variables. Establish a regression model. Since the efficiency evaluation value has a minimum limit of 0, if the ordinary least squares method is used to perform the regression directly, the parameter estimation will be biased and inconsistent. Therefore, this paper uses Tobit model for regression analysis. The specific model is as follows:

2. Among them, yi is the dependent variable. When the efficiency value is greater than 0, the actual observed

Table 1. Efficiency of urban Ecology and environment evaluation index system

Indicators	Category	Specific indicators	unit
Output indicators		Industrial output	Billion
Input indicators	Environmental pollution	Industrial wastewater discharge	10,000 tons
		Industrial exhaust emissions	tons
	Energy consumption	Industrial water consumption	10,000 tons
		Industrial power consumption	Billion W/h
		Industrial construction area	Km2

Table 2. Variables affecting efficiency of urban Ecology and environment factors

Variables	index
Urban structure	Urbanization rate
Industrial structure	Tertiary Industry Gross Output Value / City GDP
Environmental policy	Government Environmental Investment / City GDP
Geographic dummy variable	North and Central Dumb Variables
Control variable	Urban population growth rate

value is taken. When the efficiency value is less than or equal to 0, the value is taken as 0. xi is the independent variable and the actual observed value is taken; β is the unknown parameter.

Variable Selection

Efficiency of urban Ecology and environment emphasizes the maximization of economic benefits in terms of less resource consumption and environmental damage, and is consistent with the principle of minimizing input goals and maximizing output goals of DEA. In the previous studies, choosing the income index as the output index was characterized by the fact that the bigger the better, and the cost index is the input index. The characteristic is that the smaller the better. Industry is an important core for the development of the real economy and an important area for achieving high-quality economic development. The industrial economy of Jiangsu Province is large and supports the sustained and rapid economic development of the province. Therefore, when evaluating the efficiency of urban Ecology and environment of cities in Jiangsu, select the relevant indicators of urban industry. The consumption of resources and environmental pollution in urban industrial production are used as input indicators of the DEA model, that is, the pressure brought by the industry to the ecological environment or the cost paid; the industrial output value of the urban industry is used as an output indicator.

This article selected industrial wastewater discharges and exhaust emissions as indicators of environmental pollution, and included industrial water consumption, electricity consumption and construction land area into the input indicators; and the industrial output value as the output indicator of ecological efficiency. See **Table 1** for details.

There are many factors that affect urban efficiency of urban Ecology and environment. Apart from input and output factors, some socio-economic factors also have an impact on efficiency of urban Ecology and environment. This article refers to existing research, combined with the availability of data, select factors that affect urban efficiency of urban Ecology and environment include: ① urban structure, choose the urbanization rate to represent. ② The industrial structure is expressed using the ratio of the total economic output of the tertiary industry to the GDP of the city. ③ Environmental policies are expressed as the ratio of government environmental investment to urban GDP. ④ Geographical dummy variables to examine the differences in ecological efficiency in different regions of Jiangsu Province. ⑤ Control variables, choose urban population growth rate. See **Table 2** for details.

This article takes 13 cities in Jiangsu Province as the research object, and divides them into the three major regions of southern Jiangsu, Central Jiangsu, and northern Jiangsu, and collects 13 cities from the Statistical Yearbook of Jiangsu Province in 2009-2015 and the Statistical Yearbook of Chinese Cities. Data on inputs, outputs, and influencing factors. In order to avoid the possible heteroscedasticity of the data, the stable sequence is easily obtained after logarithmic processing of the time series and does not change its characteristics. The relevant data is subjected to logarithmic processing.

EMPIRICAL RESULTS AND ANALYSIS

Analysis of Urban Efficiency of Urban Ecology and Environment Measurement in Jiangsu Province

According to the DEA model of super-efficiency, this paper uses EMS1.3 software to calculate the urban

Table 3. Results of Urban Efficiency of urban Ecology and environment Measurement in Jiangsu

Region/City	2009	2010	2011	2012	2013	2014	2015	Mean
Southern Jiangsu	1.552	0.939	1.252	1.257	1.218	1.1394	1.124	1.209
Nanjing	0.863	0.869	0.874	0.855	0.896	0.887	0.892	0.877
Zhenjiang	0.861	0.874	0.734	0.731	0.748	0.678	0.642	0.753
Changzhou	0.902	1.034	0.923	0.945	0.975	0.972	0.978	0.961
Wuxi	0.974	1.277	1.142	1.263	1.212	1.312	1.358	1.220
Suzhou	1.326	1.071	1.443	1.167	1.184	1.181	1.163	1.219
Central Jiangsu	2.254	2.351	2.262	2.603	2.392	2.531	2.583	2.425
Yangzhou	1.231	1.263	1.257	1.253	1.181	1.204	1.193	1.226
Taizhou	1.113	1.058	1.308	1.362	1.259	1.398	1.458	1.279
Nantong	0.994	1.154	0.883	0.808	0.933	0.814	0.767	0.908
Northern Jiangsu	0.912	0.674	0.593	0.543	0.509	0.365	0.272	0.553
Xuzhou	1.049	0.808	0.691	0.454	0.475	0.376	0.354	0.601
Huai'an	0.484	0.486	0.474	0.463	0.493	0.476	0.476	0.479
Suqian	0.513	0.394	0.308	0.294	0.282	0.269	0.244	0.329
Yancheng	1.471	1.263	1.421	1.834	2.382	2.392	2.631	1.913
Lianyungang	0.825	0.711	0.482	0.457	0.453	0.382	0.371	0.526
Mean	0.970	0.943	0.918	0.914	0.959	0.949	0.964	

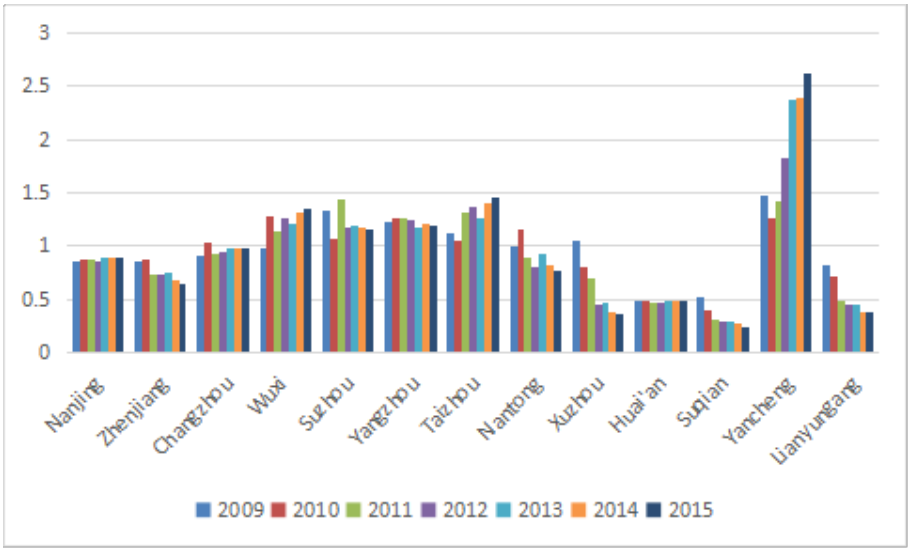

Fig. 1. Trend of Urban Efficiency of urban Ecology and environment in Jiangsu Province, 2009-2015

efficiency of urban Ecology and environment of 13 cities in Jiangsu, South Jiangsu, Central Jiangsu and northern Jiangsu from 2009 to 2015. The results are shown in **Table 3**.

According to **Table 3**, the average urban efficiency of urban Ecology and environment in Jiangsu Province fluctuated between 0.914 and 0.970 during the period from 2009 to 2015, and it was at a moderately high level. The average value fell first and then increased. Among the 13 cities in Jiangsu, Yancheng, Taizhou and Yangzhou have always ranked among the top cities in terms of their ecological efficiency from 2009 to 2015. The specific conditions of each city are shown in **Fig. 1**. Yancheng's industrial efficiency of urban Ecology and environment has been at a relatively high level and has maintained a rapid growth since 2010. In recent years, Yancheng has always adhered to the concept of "priority in environmental protection and green development" and paid close attention to pollution control. The quality of the city's ecological environment has improved significantly. Since the 18th National Congress of the People's Republic of China, Yancheng has consistently built a good ecology as the city's biggest advantage and brand. The province has the best environmental air quality, and has the largest afforestation area in the province. There are significant differences in the level of ecological efficiency among other cities, among which the average efficiency of urban Ecology and environment values of Wuxi, Suzhou, Changzhou and Nantong are between 0.908 and 1.220, and they are in the middle-upper level; the average efficiency of urban Ecology and environment of Nanjing and Zhenjiang are 0.877 and 0.753 respectively. Mid-level; and Xuzhou, Lianyungang, Huai'an, Suqian's efficiency of urban Ecology and environment is lower, below 0.601.

According to the change trend of the efficiency of urban Ecology and environment of each city, Nanjing and Huai'an have little tendency to change, and most of the cities except Yancheng are alternating. The declines in Xuzhou, Lianyungang, and Suqian were more obvious, resulting in a lower overall ecological efficiency in the northern Jiangsu region, especially in Xuzhou, where the decline was most significant, falling from 1.049 to 0.354. As a resource-exhausted city, Xuzhou has a prominent ecological shortcoming. Since 2013, Xuzhou has been identified as the first batch of pilot cities for the construction of national ecological and civilized cities. In accordance with the requirements of the Jiangsu Provincial Government, Xuzhou has adopted comprehensive remediation, source control, dredging and dredging. Various measures such as development have been effectively explored in the promotion mechanism, financing mode, and comprehensive management of water ecological civilization construction, but the ecological problems brought about by the existing extensive economic model still need to continue to be addressed.

From a regional point of view, the ecological efficiency in central Jiangsu is relatively high, with an average of 2.425, 1.209 in southern Jiangsu and a minimum of 0.553 in northern Jiangsu. It should be noted that the most economically developed southern Jiangsu has a lower ecological efficiency than the central region. Nanjing and Zhenjiang have lower ecological efficiency than the other three cities, thus lowering the overall level of ecological efficiency in southern Jiangsu. This shows that in the period of rapid economic growth in Nanjing and Zhenjiang, the resource consumption is serious, the emission of harmful substances has increased, and the ecological environment has not significantly improved. At the same time, while Suzhou and Wuxi are developing their economies, they attach great importance to the protection of the environment. The overall level of efficiency of urban Ecology and environment in the northern region of Jiangsu is relatively low. Due to its own lack of economic development and backward technology, it can only drive the development of local economy through the development of capital-intensive industries, which intensifies environmental pollution. The economy of Central Jiangsu is relatively developed, the level of science and technology is relatively high, and the level of production technology and technology have been improved. Therefore, the level of ecological efficiency is relatively high.

Analysis of Factors Affecting Urban Efficiency of Urban Ecology and Environment in Jiangsu

Through the previous research, it is not difficult to find that the level of efficiency of urban Ecology and environment varies among cities in Jiangsu, and there is a gap in the level of industrial development, industrial structure, or other policies in each city. In order to further explore the causes of these differences, this article will focus on examining the impact of urban structure, industrial structure and environmental policies on urban efficiency of urban Ecology and environment, and gradually increase the number of factors in the model for analysis. In addition, the population growth rate was added as a control variable in the regression equation, and a geographic dummy variable was added to verify the differences in ecological efficiency in the three regions of southern Jiangsu, Central Jiangsu, and northern Jiangsu. The data of each city in Jiangsu Province from 2009 to 2015 was selected for regression analysis. The data was collected and compiled through the Statistical Yearbook of Jiangsu Province.

Observing the results in **Table 4**, we can see that in the four models, the β value of the population growth rate variable is negative, and the data is relatively stable. Therefore, population growth will have an adverse effect on urban efficiency of urban Ecology and environment. After adding the urban structure variable in Model II, the log-likelihood value rises to -11.942, and the goodness of model II is better than that of model I, indicating that the urban structure have an impact on the urban ecological efficiency. The β value of urbanization rate in Model II is 0.218, and there is a positive correlation between urbanization rate and urban ecological efficiency. In Models III and IV, the impact of urbanization rate on urban efficiency of urban Ecology and environment remains positive and the level of significance becomes higher. The expansion of the urban scale symbolizes the improvement of urban infrastructure, the residents' requirements for their own living environment will gradually increase, and the government will also continuously increase the greening measures. Especially in the more developed Jiangsu cities, the government will formulate more effective Anti-pollution treatment measures, therefore, urban ecological efficiency will increase with the increase of urbanization.

Table 4. Empirical results of the influencing factors of urban efficiency of urban Ecology and environment in Jiangsu

	Model I	**Model II**	**Model III**	**Model IV**
Constant term	1.073 (22.31)	-0.374 (-0.63)	0.169 (0.38)	0.021 (0.06)
F	42.51	32.41	32.06	26.56
Log likelihood	-15.427	-11.942	0.956	1.043
Pseudo R2	0.492	0.615	1.052	1.036
North Jiangsu dummy variable	-0.071 (0.45)	-0.513 (1.73)	-0.966 (2.97)	-0.971 (2.96)
Central Jiangsu dummy variable	0.054 (0.82)	0.354 (2.81)	0.478 (3.12)	0.501 (3.36)
Population growth rate	-0.049 (-3.82)	-0.057 (-3.94)	-0.049 (-4.75)	-0.051 (-4.35)
Urbanization rate		0.218 (2.41)	0.081 (3.98)	0.084 (4.03)
Industrial structure			-0.104 (-4.28)	-0.102 (-4.21)
Environmental policy				0.169 (0.51)

Note: z value in parentheses

Model III adds industrial structure variables, and the log-likelihood of the model increases significantly. This shows that the industrial structure is an important factor affecting the urban efficiency of urban Ecology and environment. The β value of the industrial structure in model III is -0.104, and the beta value of model IV after adding the environmental policy variable is -0.102, indicating that the industrial structure has adverse effects on the urban ecological efficiency. In general, a reasonable industrial structure will have a positive impact on efficiency of urban Ecology and environment. However, at present, Jiangsu Province is in an important period of industrial restructuring and upgrading, and the existing secondary industry-dominated landscape will not immediately undergo dramatic changes. Therefore, existing the industrial structure will have a negative impact on the urban efficiency of urban Ecology and environment in Jiangsu. In model IV, environmental policy variables were added, but the log-likelihood of the model did not increase significantly. Although the value of β was positive, it was not significant. This shows that environmental policies have little effect on the promotion of urban efficiency of urban Ecology and environment in Jiangsu. Of course, this result may also be related to the lack of sufficient government environmental protection investment. At the same time, even if the funds are invested, the improvement of the environment is a long-term process. Therefore, the environmental policy has no obvious effect on the promotion of urban efficiency of urban Ecology and environment in Jiangsu.

CONCLUSION AND SUGGESTION

This paper calculates the efficiency of urban Ecology and environment values of 13 cities in Jiangsu from 2009 to 2015 based on the super-efficiency DEA model, and uses the Tobit model to perform regression analysis on the urban structure, industrial structure, and environmental policies. The conclusions are as follows:

From 2009 to 2015, Jiangsu's urban efficiency of urban Ecology and environment was relatively stable and was at the middle-to-upper level. Among them, the highest level of efficiency of urban Ecology and environment is in the Central and Central Jiangsu Provinces, the southern Jiangsu Province and the lowest in the northern Jiangsu Province. There is a significant difference in the efficiency of urban Ecology and environment of each city, and most of the city's efficiency of urban Ecology and environment did not increase continuously over time. This shows that Jiangsu cities still have some space for energy conservation and emission reduction, and there are also high consumption and high pollution in industrial production. Due to differences in resource types, production technologies, and scientific and technological innovations, cities have caused differences in ecological efficiency. Urbanization rate will have a positive impact on urban efficiency of urban Ecology and environment in Jiangsu, and industrial restructuring will have an inhibitory effect on urban efficiency of urban Ecology and environment. Industrial-led industrial structure is not conducive to the improvement of urban efficiency of urban Ecology and environment. Environmental policies have little effect on the promotion of urban efficiency of urban Ecology and environment. They mainly rely on

increasing the scale of government environmental protection investment to improve efficiency of urban Ecology and environment, and their effects are more effective.

Therefore, in order to achieve the goal of sustainable development in Jiangsu, several suggestions are made: First, we must reasonably control population growth. Not only controlling the population, but also improving the quality of the population, especially strengthening the people's awareness of environmental protection and action, calling on residents to save energy and reduce emissions. Second, we must promote the optimization and upgrading of the industrial structure. At the same time as the rapid development of industry, the pollution and destruction of the atmospheric environment have been exacerbated. Therefore, the government should appropriately adjust the industrial structure, vigorously develop the tertiary industry and the environmental protection industry, develop toward green manufacturing, gradually eliminate backward technology enterprises, and make total pollutant discharges to reduce pollution discharges under continuous growth of total economic output. . Third, improve the urban infrastructure construction. At the same time of urbanization development, it is necessary to continuously improve the urban infrastructure construction, expand the urban greening area, use clean energy, and promote green travel. Fourth, strengthen environmental protection policy support. Eco-environmental protection not only requires public attention and media promotion, but also requires the government's attention. On the one hand, the government should continuously increase the scale of environmental protection investment to increase the efficiency of environmental protection investment. On the other hand, it must also formulate corresponding policies to raise the standards for pollutant discharge charges, formulate environmental protection preferential policies, or improve relevant laws and regulations for environmental protection industries, and establish a scientific and effective supervision system.

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