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Development Level Measurement and Influencing Factors of Green Finance Based on EWM and Probit Models Taking the Yangtze River Delta Economic Zone as an Example

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Abstract

This paper uses entropy method to evaluate the level of green financial development in the provinces of Yangtze River Delta Economic Zone from 2011 to 2018, and on this basis establishes the Probit model to study the relevant influencing factors, aiming to provide relevant suggestions for the green financial development of Yangtze River Delta Economic Zone. The research shows that there is still a certain gap between the overall level of green financial development in the Yangtze River Delta Economic Zone, and the influence factors of the green financial development level are significant, and the degree of influence corresponding to the differences of provinces is different. Based on the above research results, this paper puts forward some suggestions to give full play to the joint and synergistic development effect of Yangtze River Delta Economic Zone, draw on the advanced experience of green finance development at home and abroad, and construct a green financial development system scientifically.

Keywords

Yangtze River Delta Economic Zone; Green Finance; Level of Development; Probit Model.

1. Introduction

In recent years, people have gradually realized the important situation of developing green finance, from the green finance, research, development, has become a hot topic of discussion from all walks of life. General Secretary Xi Jinping has proposed to promote green development, circular development and low-carbon development through the construction of a green financial system, effectively achieving the goal of sustainable economic development. In October 2015, the Fifth Plenary Session of the 18th Central Committee of the Communist Party of China once again made it clear that China should develop green finance and set up a green development fund. In March 2016, "establishing a green financial system, developing green credit, green bonds, and setting up a green development fund" was again written into China's 13th Five-Year Plan. In April 2021, the People's Bank of China, together with the Development and Reform Commission and the CSRC, jointly issued the Green Bond Support Project Directory (2021 Edition), which is essential to regulate the healthy development of the green bond market. Based on the study object of Shanghai, Jiangsu, Zhejiang and Anhui provinces in the Yangtze River Delta Economic Zone, and with the study period from 2011 to 2018, the paper determines the level of green financial development and influencing factors in each province through the study of the data of green financial indicators, and analyzes them vertically and horizontally, and finally puts forward scientific and reasonable suggestions based on the results of the study.

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2. Literature Review

In the study of the level of green financial development, Zhang Yu measured the level of green financial development in Beijing, Tianjin and Fujian in 2011-2015 by constructing a green financial development evaluation index system in2016. And there is still a lot of room for development [1]. Yang Yang et al., taking the level of green financial development in Shanghai from 2011 to 2015 as an example in 2017, came to the conclusion that the rapid development of green credit, green securities and green insurance in Shanghai and the slow development of green investment and carbon finance [2]. Zhou Teng et al. measured the green financial index data of 30 provinces and cities in China from 2008 to 2016 in 2019.. The research analyzes the level of green finance development in China, and the research shows that the level of green finance development in the period of economic stability is higher than that of high-speed economic growth, and the development rate of the central region is at the front end [3]. Wang Wenjing, He Taiyi and others used entropy method in2021 to scientifically evaluate the level of green financial development in Beijing-Tianjin-Hebei region from2007 to2018 years, and the results show that the level of green financial development in the three places is the same. Trends are positive but still uneven [4].

In the study of the influence factors of green finance development, Ma Junhong and Xu Feng used the joint analysis method to study the influence factors of green finance in2015, and the results showed that the utility of green finance to financial institutions is not high [5]; Xu Xuchu et al. used the main component analysis method to study the level of green finance development in China in 2017, and the results showed that: The influence of education ratio, pollution control investment, resident income level and financialization degree on green financial development was ranked in descending order [6]. Xie Tingting, Gao Lili and others used the DEA-Tobit model to study the green financial influence factors in the green financial reform and innovation pilot area in2019, and the results show that: the level of education input and economic development play a significant role in the improvement of green financial efficiency. And the influence of different influencing factors on green finance efficiency varies from time to time [7]. Qiao Qin, Fan Jie et al. studied the factors influencing the development of green finance in provinces along the belt and Road in 2021 by empirical analysis, and the results showed that the level of economic development and scientific and technological innovation had a positive impact on the development of green finance, while environmental pollution had a negative impact [8].

To sum up, the existing research discusses the measurement analysis and influencing factors of the current level of green finance development in China, which has important enlightenment to the study of green finance development in the Yangtze River Delta region. However, there is no uniform standard in the existing literature in the evaluation of various levels and the determination of measurement indicators, only according to subjective factors to determine the existence of one-sided measurement indicators, so the innovation point of this paper is: (1) Through the collation and induction of past indicators, design a set of representative. (2) The comprehensive evaluation model of green financial development level is reasonable, and it is of practical significance to choose the Yangtze River Delta economic zone of typical urban cluster of financial agglomeration as the research object. (3) The results of the established data analysis are achieved by means of a variety of analytical methods and measurement software, which are normative.

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3. Analysis of the Level of Green Financial Development in the Yangtze River Delta

3.1. Selecting the Evaluation Method

In the existing academic research, most scholars have carried out measurement analysis of the level of green financial development, in the process, the most critical step is the determination of the weight of indicators. After the verification of the academic circles, the methods to determine the index weight are mainly hierarchical analysis, main component analysis, entropy right method and so on. Among them, the hierarchical analysis method has a certain subjectivity, and the main component analysis method may lead to distortion of the original indicator data in the process of dimensional reduction. Therefore, under the comprehensive consideration, the entropy right method will be used to determine the weight of the green financial development level of each indicator, and then the Yangtze River Delta provinces of the green financial development level of2011-2018 comprehensive evaluation. In the course of practical application, entropy right method will calculate the weight of each indicator according to the degree of variation of each indicator, using information entropy, specifically, the greater the degree of variation of the indicator value, the greater the information entropy carried by the index, so it will be given a larger weight; The specific calculation process of entropy right method is as follows:

Suppose there are n evaluation objects and m evaluation index variables, then the value of the ith evaluation object In the t year with respect to the JTH index variable is $a_{ij}^{t}(i = 1,2 \cdots n; j = 1,2 \cdots m; t = 1,2 \cdots)$, and construct the original data matrix is $A = (a_{ij}^{t})_{n\times m}$.

◆Standardized processing of data

Assuming that the value for standardized processing of the original data is b_{ij}^{t}.

$$b_{ij}^{t} = \frac{a_{ij}^{t} - a_{min}}{a_{max} - a_{min}} \tag{1}$$

◆Calculate the proportion of each indicator value

Using the standardized data matrix $B = (b_{ij}^{t})_{n\times m}$, the specific gravity $p_{ij}^{t}(i = 1,2 \cdots n; j = 1,2 \cdots m; t = 1,2 \cdots)$.

$$p_{ij}^{t} = \frac{b_{ij}^{t}}{\sum_{i=1}^{n} b_{ij}^{t}}, (i = 1,2 \cdots n; j = 1,2 \cdots m; t = 1,2 \tag{2}$$

◆Calculate the entropy of the j indicator:

$$e_{j}^{t} = -\frac{1}{lnn}\sum_{i=1}^{n} p_{ij}^{t} lnp_{ij}^{t}, j = 1,2, \cdots m \tag{3}$$

◆Calculate the coefficient of variation of the j indicator:

$$g_{j}^{t} = 1 - e_{j}^{t}, j = 1,2, \cdots m, t = 1,2 \cdots \tag{4}$$

For the JTH index, the larger e_{j}^{t} is, the smaller the variation degree of the index value is.

◆Calculate the weight of item j:

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$$w_j^t = \frac{g_j^t}{\sum_{j=1}^{m} g_j^t}, j = 1,2,\cdots m, t = 1,2\cdots \quad (5)$$

◆Calculate the combined score of the ith evaluation object:

$$S_i^t = w_1^t \times p_{i1}^t + w_2^t \times p_{i2}^t + \cdots + w_j^t \times p_{ij}^t \quad (6)$$

In this paper, the evaluation object is the development level of green finance, because I =1 in Equation (6), that is, S represents the comprehensive score of the development level of green finance, $w_1, w_2 \cdots w_j$ represents the score of each indicator, $p_1, p_2 \cdots p_j$ represents the weight of each indicator, and T represents each year of calculation.

3.2. To Construct A System of Evaluation Indicators

Whether the level of green financial development can be better measured in the provinces of Yangtze River Delta region depends mainly on whether the construction of evaluation index system is reasonable, so the construction of an effective green financial evaluation index system has become the key to this paper. Under the condition of considering the accuracy and innovation of the research content, this paper makes reference to the opinions of Li Hong, Zhang Xin, Zhou Teng and other scholars, and constructs a set of index system with wide coverage, strong representation and high recognition. The index system includes five green financial instruments, namely green credit, green securities, green investment, green insurance and carbon finance. The five indicators are described in depth below.

(1) Green credit. In the current research stage, because the data of the provinces of the green credit index are not fully disclosed, the proportion of interest expenditure in high energy-consuming industries will be selected in this paper to measure the green credit index. Generally speaking, the scale of interest expenditure is proportional to the amount of loans, that is, the larger the size of interest expense, the higher the loan amount, and the proportion of interest expenditure in high energy-consuming industries reflects green credit from the reverse point of view.

(2) Green securities. In past academic studies, some scholars have measured green securities by the proportion of environmental protection enterprises in various provinces, which, although it is easier to obtain large amounts of data, ignores the difference in heterogeneity between enterprises. Therefore, this paper will use the total market value ratio of environmental protection enterprises in each province to reflect the green securities as an indicator, through the market value ratio to evaluate the contribution of each province to green securities at this level of green finance, thus reflecting the social significance of green securities as an indicator.

(3) Green investment. Green investment is the investment in energy conservation and environmental protection projects. In Zhang Xin et al.'s research, the proportion of investment in environmental pollution control has been used to measure the proportion of green investment, but in real life, this index layer may not fully reflect the amount of green investment, so this paper will use the provinces to clean environmental protection energy industry investment ratio to measure the development level of green investment in various regions.

(4) Green insurance. Green insurance this indicator covers a wide range, of which green insurance payout rate, green insurance coverage has been put forward by most scholars, but because the relevant legislative system of these indicators was established late, there is a disconnect in the data, so this paper uses the proportion of agricultural insurance to replace the level of green insurance development, the reason is that the development of agricultural

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insurance mostly depends on the development of green environment, so the proportion of agricultural insurance and green insurance is closely related.

(5) Carbon finance. Carbon finance this indicator in recent years has developed rapidly, the market trading scale is expanding, using this indicator to measure the level of green financial development has been recognized by many experts in the world. This paper will use the emissions of greenhouse gases from each province to reflect the level of carbon finance development, in particular, the more greenhouse gas emissions, the worse the level of green financial development reflected in carbon finance, the lower the greenhouse gas emissions, the better the level of green financial development reflected in carbon finance. The individual indicators are shown in Table 1.

Table 1. Green financial development level evaluation index system

Target layer	Criteria layer	Indicator layer	Weight
Green finance	Green credit	Percentage of interest expense in energy-intensive industries (%)	0.235
	Green securities	Percentage of total market capitalisation of environmentally friendly companies (%)	0.189
	Green investment	Percentage of investment in the clean and environmentally friendly energy industry (%)	0.213
	Green insurance	Percentage of agricultural insurance (%)	0.196
	Carbon finance	Greenhouse gas emissions (tons)	0.167

3.3. Comprehensive Evaluation of the Level of Development

First of all, this paper takes the level of green financial development in Shanghai, Zhejiang, Jiangsu and Anhui provinces of the Yangtze River Delta Economic Zone as the research object and research interval from2011 to 2018.Secondly, according to the entropy method described above, the weight of the five indicator layers is determined, that is, the weight of green credit is0.235,the weight of green securities is 0.189,the weight of green investment is0.189,the weight of green insurance is0.169,and the weight of carbon finance is0.167.Based on the weights of each indicator determined, the data of each indicator for each year corresponding to the four provinces mentioned above are obtained from the comprehensive evaluation of the level of green financial development of the provinces of the Yangtze River Delta Economic Zone for the period2011-2018, shown in Table 2 below, at the same time, To more intuitively observe trends in the level of green financial development, Table 2 is plotted as a line in Figure 1.

Table 2. Financial Development Level Score for Yangtze River Delta Economic Zone

Region	Year	Score	Region	Year	Score	Region	Year	Score	Region	Year	Score
Shanghai	2011	0.155	Jiangsu	2011	0.142	Zhejiang	2011	0.201	Anhui	2011	0.163
	2012	0.168		2012	0.156		2012	0.242		2012	0.175
	2013	0.174		2013	0.169		2013	0.231		2013	0.214
	2014	0.181		2014	0.177		2014	0.219		2014	0.225
	2015	0.192		2015	0.198		2015	0.247		2015	0.237
	2016	0.187		2016	0.192		2016	0.241		2016	0.232
	2017	0.207		2017	0.225		2017	0.263		2017	0.243
	2018	0.227		2018	0.248		2018	0.269		2018	0.256
Average score		0.186	Average score		0.188	Average score		0.239	Average score		0.218

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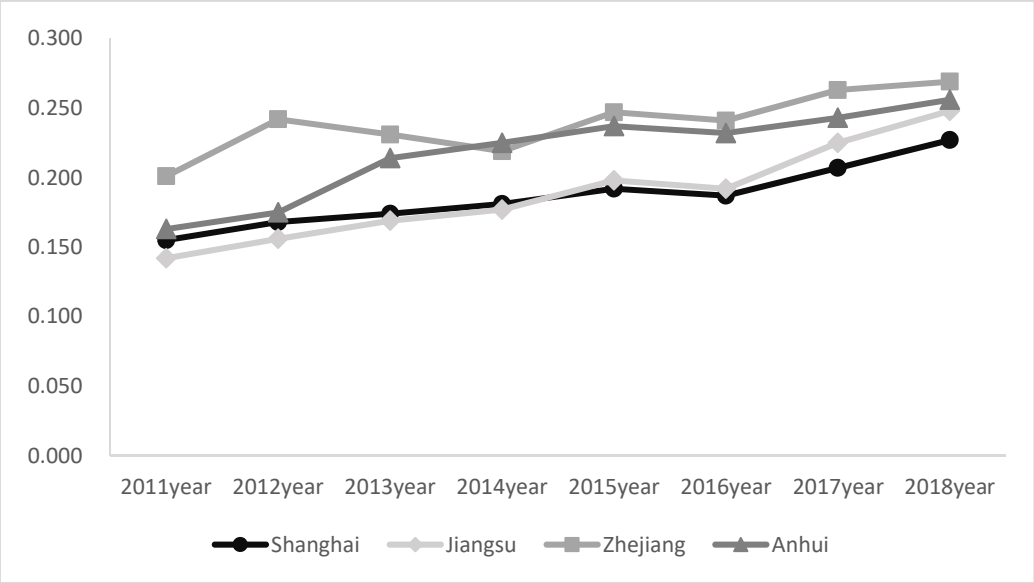

Figure 1. Provinces 2011 -2018 Composite Score Line Chart

From a horizontal point of view, that is, from different regions of the Yangtze River Delta Economic Zone, there are differences in the level of green financial development between different provinces, and shows the "Zhejiang→ Anhui→ Jiangsu → Shanghai" descending order trend, which shows that Zhejiang Province in comparison with the other three provinces, there are comparative advantages in green finance, of which Jiangsu Province and the other three provinces are the most different. In2011, Jiangsu Province's combined score was 0.142, while Shanghai's and Anhui Province's scores were similar, at 0.155 and 0.163respectively, Shanghai is 0.248, Anhui and Zhejiang's combined score rose to 0.227, 0.256 and 0.269 respectively, showing that in the seven years, Jiangsu Province's green financial development level is the fastest, followed by Zhejiang and Anhui, and finally Shanghai. Although the level of green finance development varies from region to region and the growth rate varies, the level of green finance development in the yangtze River economic zone as a whole shows a steady growth trend. Zhejiang Province in the early period of the green financial development momentum, for the later stage of development has laid a solid foundation, under the reform of the government, a large number of talents and technology, so its level of green financial development in the first is also reasonable.

From a vertical point of view, that is, from the perspective of the timeline, the level of green financial development in the Yangtze River Delta Economic Zone varies between different years. Over time, the level of green finance development in each province has shown an upward trend overall, but there have also been years of decline, such as 2016, the level of green finance development in all regions is declining, possibly due to the transition of green finance from the embryonic stage to the development stage. Among them, Anhui Province in2012-2013 the steepest line changes, indicating that during this period its green financial development level is the fastest, in other time periods to maintain a uniform growth rate. Between2012 and2014, the level of green financial development in Zhejiang Province showed a downward trend, mainly due to the impact of new local policies, and then the trend of growth was restored. According to the average score of green financial development level in each province obtained in Table 2, it can be seen that the overall level of green financial development in the Yangtze River Delta Economic Zone exceeded the average level of development in2015 and beyond, but in any year, the green financial development in Shanghai is at a low level, which may be due to the transition of Shanghai to pursue economic level development. Neglecting the development

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of green finance, therefore, in order to make the Yangtze River Delta economic zone develop in harmony, we should make great efforts to develop green finance in Shanghai.

4. Analysis of the Influencing Factors of the Level of Green Financial Development in the Yangtze River Delta

4.1. Selection of the Model

According to the results of green finance development level in different regions measured above, the ordered Probit model can be used to explain the influencing factors of green finance development level. In this study, the Probit model takes the development level of green finance as the explained variable, and each influencing factor as the explanatory variable. The linear relationship between the explained variable Y^* and the explanatory variable x_{ij} is shown as follows:

$$Y^* = x_{ij}\beta + \varepsilon, (i = 1,2,3,4; j = 1,2,3,4) \tag{7}$$

In the above formula, Y^* is the explained variable, x_{ij} is the explanatory variable used for the development level of green finance, β is the coefficient of each explanatory variable affecting the development level of green finance, and ε is the random error term.

Meanwhile, Y^* has the following relationship with the ordered variable Y:

$$Y = \begin{cases} 1(\text{poor}) Y^* < a_1 \\ 2(\text{littlepoor}) a_1 \le Y^* < a_2 \\ 3(\text{general}) a_2 \le Y^* < a_3 \\ 4(\text{littlegood}) a_3 \le Y^* < a_4 \\ 5(\text{good}) Y^* \ge a_4 \end{cases} \tag{8}$$

In the above formula, Y is a piecewise function on the whole interval, $a_i$is each critical value on the Y^* interval. When Y is equal to 1, it indicates that the development level of green finance in this region is poor. When Y is equal to 2, it indicates that the development level of green finance in this region is poor. When Y is equal to 3, it indicates that the development level of green finance in this region is average. In this way, when Y is equal to 4 and 5, the development level of green finance in this region is good and good, respectively. And the expression of the ordered Probit model is shown as follows:

$$Pr = (Y = M) = \emptyset(x_{ij}\beta) \tag{9}$$

In the above formula, the value of M is 1,2,3,4,5; $\emptyset$ is an aggregate function for standard normal distribution.

β and a_i were solved by using the maximum of the logarithmic likelihood function of the standard accumulative function, and then the influence trend and degree of each factor on the development level of green finance were obtained.

4.2. Setting of the Variable

Based on the research of Zhou Teng, Qiao Qin, Fang Jianguo and other scholars, as well as the summary and summary of ourselves, this paper determines the level of green financial development as the dependent variable, taking the level of economic development, the state of educational development, the investment of environmental protection, the situation of

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scientific and technological innovation as the independent variable, and the specific variables are explained as follows:

(1) Level of green financial development. The average level of green financial development in the Yangtze River Delta regions calculated above is interpreted as an explanatory variable. The level of green financial development focuses on the correlation between the coordinated development of green financial factors between regions to measure the overall development of green levels in the region.

(2) Level of economic development. There are differences in the level of economic development in different regions, and the level of green finance development is also restricted by the level of economic development in the region. If the region's economic development level is depressed, its green financial development will also be affected. In this paper, the per capita GDP of the Provinces of the Yangtze River Delta is used as an indicator to measure the level of economic development.

(3) The state of educational development. Education is the essence of ruling the country, which is of great significance to the country's training of talents and the development of science and technology. The educational development of a region directly reflects the importance attached by the government in the area to personnel training and scientific and technological innovation. In this paper, the ratio of education expenditure to fiscal expenditure in the Yangtze River Delta region is used as an index to measure the development of education.

(4) Investment in environmental protection. As a major measure of green social development, environmental protection investment reflects the development level of the ecological environment in the region, and plays an important role in the sustainable development of green finance. The increasingly serious environmental problems have become one of the main reasons for the government to develop green finance vigorously, and when the investment in environmental protection is greater, the more obvious its output performance is, which indicates that the level of green finance development has been raised. In this paper, the ratio of environmental protection investment to fiscal expenditure in the Yangtze River Delta provinces is used as an index to measure environmental protection investment.

(5) Science, technology and innovation. The degree of scientific and technological innovation is an important symbol of social progress and an important means to strongly support the cultivation of talents. Usually, there is a positive relationship between the degree of scientific and technological innovation and the development of finance, that is, the higher the degree of scientific and technological innovation, the higher the level of financial development. In this paper, the number of scientific and technological innovation projects in the Yangtze River Delta region is used as an index to measure the situation of scientific and technological innovation. The variable settings are shown Table 3.

Table 3. Variable settings

	Variable	Quantification method
Level of green financial development factors	Level of economic development	GDP per capita
	The state of educational development	Education expenditure / fiscal expenditure
	Investment in environmental protection	Environmental protection investment / fiscal expenditure
	Scientific and technological innovation	Number of scientific and technological innovation projects

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4.3. Analysis of Regression Results

In this paper, the Strata14.0 software is used to build an orderly probit model to analyze the factors affecting the level of green financial development in the Yangtze River Delta Economic Zone, as Table 4.

Table 4. Each variable affects the result

Region	Variable	Mean	Variance	Coefficient	P-value
Shanghai	Level of economic development	0.529	0.212	0.836	0.000
	The state of educational development	0.213	0.243	0.132	0.021
	Investment in environmental protection	0.329	0.448	0.201	0.005
	Scientific and technological innovation	0.242	0.331	0.534	0.018
Chekiang	Level of economic development	0.374	0.274	0.632	0.000
	The state of educational development	0.256	0.351	0.153	0.000
	Investment in environmental protection	0.136	0.484	0.325	0.013
	Scientific and technological innovation	0.294	0.255	0.387	0.026
Jiangsu	Level of economic development	0.438	0.422	0.643	0.008
	The state of educational development	0.395	0.189	0.305	0.000
	Investment in environmental protection	0.207	0.293	0.203	0.014
	Scientific and technological innovation	0.312	0.285	0.301	0.000
Anhui	Level of economic development	0.249	0.134	0.324	0.004
	The state of educational development	0.134	0.242	0.172	0.000
	Investment in environmental protection	0.285	0.354	0.135	0.000
	Scientific and technological innovation	0.213	0.297	0.148	0.011

According to Table 4 above, the economic development level, educational development status, environmental protection investment and scientific and technological innovation of the four provinces of Shanghai, Zhejiang, Jiangsu and Anhui in the Yangtze River Delta Economic Zone are analyzed at different levels of significance and the following conclusions are drawn. For every additional unit of economic development, the level of green financial development in the Yangtze River Delta Economic Zone increases by 0.836,0.632,0.643and0.324 units, respectively; The level of green financial development in the Yangtze River Delta Economic Zone increased by 0.132,0.153,0.305 and 0.172 unitsrespectively; The level of green financial development in the Yangtze River Delta Economic Zone increased by 0.201,0.325, 0.203 and 0.135 units respectively; The level of green financial development in the Yangtze River Delta Economic Zone increased by 0.534,0.387,0.301and0.148 units, respectively. It can be seen that the level of green financial development in the Yangtze River Delta Economic Zone is positively related to the level of economic development, the state of education development, investment in environmental protection and scientific and technological innovation, that is, with the increase of investment in economy, education, environmental protection and scientific and technological innovation, the economic development vitality of the Yangtze River Delta Economic Zone has been continuously enhanced, thus making the level of green financial development on the basis of the original to be further improved.

From the point of view of marginal effect, the factors that have the greatest influence on the level of green financial development in the provinces of Yangtze River Delta Economic Zone are the level of economic development, and the other three factors have different levels of marginal utility influence in different regions. From the point of view of practical significance is not difficult to understand, the development of green finance needs the support of economic conditions, when the economic conditions of this factor produces a higher vitality, the corresponding green finance also has a larger space for development, so the continuous development of green financial sources play a vital factor for the economic level.

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From the effect of various influence factors on different provinces, the level of economic development plays the most obvious role in the development level of green finance in Shanghai, the development of education plays the most important role in the development level of green finance in Jiangsu, the investment of environmental protection has the greatest impact on the level of green finance development in Zhejiang, and the scientific and technological innovation has the most obvious effect on the level of green finance development in Shanghai. The main reason for this phenomenon is that Shanghai is located in China's coastal areas, gathered a group of young talents and most of the experimental project development points, making the economy and science and technology has become the most significant factor affecting its level of green financial development. Over the years, the Jiangsu government has attached great importance to the development of education, and concentrated on investing a lot of manpower and material resources in this regard, so that education has a greater impact on the development of green finance. Zhejiang is the first urban point in China to realize the new rural reform, and its government has invested more energy in the construction of "beautiful countryside", so the effect of environmental protection investment on Zhejiang is most obvious and reasonable.

5. Conclusions and Recommendations

5.1. Conclusions

As one of the typical urban groups of China's financial cluster development, the development of green finance is a necessary way to achieve the healthy and sustainable development of China's economy, so it is of great significance to study the measurement of the level of green financial development and its influencing factors to improve the efficiency of green financial development level, realize the sustainable development of china's economy and move towards a high-quality economy. Based on the construction and evaluation of the various indicators of green financial development level, this paper makes a comprehensive analysis of the green financial development level and influencing factors in the Yangtze River Delta Economic Zone by means of entropy right method and Probit model. The main conclusions are as follows:

(1) From the macro pattern of the Yangtze River Delta Economic Zone, the level of green financial development of the Yangtze River Delta Economic Zone as a whole developed in concert, and over time, the overall performance of the trend of positive growth. From the perspective of each province, the level of green financial development shows the descending order of "Zhejiang→ Anhui→ Jiangsu → Shanghai". Zhejiang, Anhui and Jiangsu have seized the opportunities and challenges in the development of the past two years, and their level of green financial development has been greatly improved, although the level of green finance development in Shanghai is still at a low level, but in the whole timeline study its score value is also in a steady growth stage.

(2) From the perspective of the influence factors of the Yangtze River Delta Economic Zone, this paper considers the impact factors affecting Shanghai, Zhejiang, Jiangsu and Anhui as four aspects: the level of economic development, the state of educational development, investment in environmental protection, and the situation of scientific and technological innovation. Among them, the economic development level has the largest impact on each province, and there is no obvious trend of sorting influence on the effect of the other three influence factors. From the effect of various influence factors on different provinces, the effect of different influence factors on different provinces is as follows: the level of economic development and scientific and technological innovation on the level of green financial development in Shanghai is the most obvious; In the course of developing green finance, Zhejiang Province accurately identifies the policy connotation issued by the government, vigorously develops the environmental protection project of "beautiful countryside" and realizes the steady

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development of green finance. Shanghai's training of talents and technology is still at the forefront of the city to promote sustainable economic development.

5.2. Recommendations

(1) Give full play to the joint and synergistic development effects of the Yangtze River Delta Economic Zone, form a unified internal mechanism in education, science and technology and personnel training, and promote the coordinated development of green finance and multi-regional development. While affirming the development of green finance in the region, provincial governments should recognize the shortcomings of their own development in a timely manner, strengthen green financial development cooperation with other regions, design appropriate innovative green financial products according to the development of each province, and strive to form a stable and sustainable development of the Yangtze River Delta integrated regional green economy. Provincial financial institutions should vigorously promote the development of green credit, green securities, green investment, green insurance and carbon finance, and will be the source of green finance development in the four provinces to grow into a living source of the triangular economic zone.

(2) We should draw on the advanced experience of green finance development at home and abroad to promote high-quality and sustainable economic development, optimize the financial structure and raise the level of green finance development in the Yangtze River Delta Economic Zone. In the specific development of green finance in other European countries such as the United States, we draw on the effective policies and projects implemented by various countries, such as green financial reform and innovation in the United States, including the Bank of America's "unsecured concessional loans to support the development of fuel-efficient technologies", the establishment of a professional "environmental protection insuranc ecompany" by the United States Government, etc. Based on the successful experience at home and abroad, the Yangtze River Delta Economic Zone can carry out bold reform and innovation in combination with its own development situation, continuously improve its level of green financial development, and achieve high-quality and sustainable development of the Yangtze River Delta regional economy.

(3) Scientifically construct a green financial development system to allocate the economic resources of the Yangtze River Delta region and promote the green transformation of the regional economy. The Yangtze River Delta region should jointly construct a comprehensive evaluation system to measure the development of its various indicators, and form a fair appraisal mechanism for the development of green finance in various places according to the evaluation system. This initiative can effectively promote the allocation of resources across regions in order to optimize the allocation of financial assets and achieve the efficient functioning of green finance, while playing an important role in promoting healthy and sustainable development throughout the region.

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