Analysis of the Promotion Effect of Green Finance on Economic Growth--Taking Jiangsu Province as an Example

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ABSTRACT. *Green finance is a financial system arrangement that promotes the sustainable development of the ecological environment. This paper divides green finance into broad green finance and narrow green finance, and measures the scale of regional green finance based on the existing statistical data, and then uses the spatial panel measurement research method to empirically analyze the impact of green finance on economic growth. This paper divides green finance into broad green finance and narrow green finance, and measures the scale of regional green finance based on the existing statistical data, and then uses the spatial panel measurement research method to empirically analyze the impact of green finance on economic growth. Compared with the generalized green finance, the promotion effect of narrow green finance on economic growth has been reduced. Aiming at the development of corporate green internet finance, this article puts forward suggestions: perfect corporate green financial industry development policies and guarantee mechanisms; establish and improve corporate green internet finance organization and governance structure; develop and innovate corporate green internet finance products and tools.*

KEYWORDS: *Green finance; spatial panel measurement; empirical analysis*

1. Introduction

In recent years, the development of green finance has gradually become the theme of an era. The main purpose of developing green finance is to promote energy conservation and emission reduction and achieve environmental protection, while the steady growth of the economy is the fundamental requirement to cope with the new normal. In recent years, the green economy, finance and the continuous growth of the global economy have received increasing attention from the international community. Based on this, this article analyzes and collects the statistical data of Jiangsu Province. Jiangsu is located in the economic zone of the Yangtze River Delta on the southeast coast. It has made great achievements in financial innovation. Green finance is also an important direction for Jiangsu's financial development and

innovation in recent years. Therefore, the data of some financial institutions in Jiangsu Province is selected, and the spatial panel analysis model and empirical research are used to analyze the national economic growth trends and effects of green finance. The main research issues and emphases of empirical analysis and research are (1) whether green finance promotes economic growth; (2) if green finance has an economic growth effect, how strong is this economic growth effect; (3)whether green finance the economic growth is obvious.

2. Variables, research methods and data description

This paper mainly examines the economic growth effect of green finance. Therefore, economic growth is taken as the dependent variable, and data such as green finance, investment, nationalization development level, urbanization development level, and government expenditure scale are selected as independent variables.

Empirical evidence shows that rapid economic growth is expressed in terms of the proportion of the economy in the regional GDP per capita. Nationalization investment is expressed in terms of the proportion of fixed assets nationalization investment in the regional GDP per capita. The degree of development of nationalization for investment is expressed in terms of the ratio of the operating output value of state-owned private industrial investment enterprises in municipalities above designated size in the country to the operating output value of state-owned private industrial enterprises in municipalities above designated size. The population is expressed by the level of urbanization development as the proportion of the city's permanent population. The scale of local government expenditure is expressed as the ratio of local fiscal expenditure to the GDP of the urbanized region. Except for green finance, the data in the above variables are all sorted out according to the data related to China Economic Net. Since the existing empirical literature on spatial economics shows that there is a significant global spatial autocorrelation and local spatial autocorrelation in China's regional per capita GDP, this paper uses a spatial econometric model. At the same time, the time interval of selecting the variable data of green finance enterprises in Jiangsu Province is 2015-2019, and the variable data is adjusted accordingly based on 2015.

The economic growth effect of green finance can be divided into a broad perspective of green financial economic growth effect and a narrow perspective of green financial economic growth effect. In the measurement study, the generalized green finance scale is represented by ggf, the narrow sense green finance scale is represented by ngf, per capita GDP is represented by rgdp, investment is represented by inv, urbanization level is represented by urban, and government scale is represented by gov. In order to unify the dimension, the empirical research takes the logarithm of rgdp, ggf and ngf respectively. In order to analyze more accurately, this paper has conducted an empirical analysis and discussion on the spatial weight matrix method using geographic economic distance and international economic activity distance.

3. Empirical analysis process

3.1. Broad green financial economic growth effect

By comparing the actual statistical total number of lmlag with the actual statistical total number of lmerror in the weight model figure, it is found that whether the model directly uses the geospatial distance weight in system mathematics or directly uses the geospatial distance weight in political economy, the graph of the model The actual total number of statistics in lmerror needs to be far greater than the actual total number of statistics in lmlag in the weight model. Therefore, it is more reasonable to choose a weight model with less spatial error. At the same time, Hausman statistics show that a fixed-effect model should be used. The model estimation method in empirical research uses the maximum likelihood estimation method. Table 1 lists the estimation results of the spatial panel econometric model including generalized green finance:

Table 1. Estimation results of the spatial panel measurement model of generalized green finance

Explanatory variables	Geographic distance weight matrix		Economic Distance Weight Matrix	
	coefficient	Z statistic	coefficient	Z statistic
Inggf	0.0619^{**}	2.21	0.663^{**}	2.42^{**}
inv	0.3118^{***}	2.81	0.3527^{***}	3.27
urban	2.8302^{***}	21.39	2.8167^{***}	20.81
gov	-0.2442^{***}	-1.11	-0.2361^{***}	-1.12
Constant term	8.5772^{***}	28.29	8.4745^{***}	26.73
λ	0.7215^{***}	7.69	0.7039^{***}	6.88
R2 Adj	0.9548		0.9466	

Note: * represents 10% significance level; ** represents 5% significance level; *** represents 1% significance level.

When the geographical distance spatial weight matrix is used, the effect coefficient of the generalized green financial scale on economic growth is 0.0619, and it passes the significance test at the 5% confidence level. When the economic distance spatial weight matrix is used, the effect coefficient of the generalized green financial scale on economic growth is 0.0663, which also passes the significance test at the 5% confidence level. The results of regression fully explain from a theoretical and empirical point of view that regional broad-based green finance plays a significant role in promoting economic growth and development. When the scale of regional broad green finance increases by 1% year-on-year, green finance will pass through the market and eventually drive the regional GDP per capita to grow by about 0.06%. When the geographical distance spatial weight matrix is used, the average value of the pulling coefficient of investment for rapid economic growth is 0.3118, and the confidence coefficient passes the significance test at the 1%

confidence level. The coefficient of nationalization is -0.3393, and it is significant at the 1% confidence level. The average value of the regression coefficient of the confidence level of the scale of the new urbanization project was determined to be 2.8301, which also successfully passed the significance strength test at the 1% confidence level. The regression coefficient for the scale of local government support for urbanization construction is -0.2331, and it is significant at the level of 1%. The spatial error coefficient value of the spatial panel model is 0.7214, which also passed the significance test at the 1% confidence level. When the economic distance spatial weight matrix is used, the regression coefficients of these variables have passed the significance test at the 1% confidence level, and the values have not changed much.

3.2. The narrow green economic growth effect

Green finance in a narrow sense is an institutional arrangement in which financial resources are provided by market entities to promote green development. Since the lmlmerroror statistic of the spatial error model is much larger than the lmlag statistic of the model, the model with smaller spatial error can also be considered. Table 2 lists the estimation results of the green financial spatial panel measurement model with the narrowly defined green financial scale as the main explanatory variable.

When the model uses the weighted action coefficient matrix of geographic economic distance growth space, the average value of the significance function of the scale of narrow green finance for rapid economic growth is 0.0521, which passes the test of the significance effect coefficient at the 10% confidence level. When the model uses the weight matrix of geographic economic distance growth space, the effect coefficient of narrow-scale green financial scale on economic growth is 0.0564, and it passes the significance test at the 5% confidence level. From the estimation results, it can be seen that the narrow sense of green finance has a significant role in promoting economic growth. When the scale of green finance in the narrow sense of the region increases by 1%, green finance will pass through the market and eventually drive the regional GDP per capita to grow by about 0.05%.

Table 2. Estimation results of the spatial panel econometric model of narrow green finance

Explanatory variables	Geographic distance weight matrix		Economic Distance Weight Matrix	
	coefficient	Z statistic	coefficient	Z statistic
Inggf	0.0522*	1.98	0.0565**	2.12
inv	0.2985***	2.65	0.3367***	3.12
urban	2.8339***	21.27	2.8097***	20.75
gov	-0.2636***	-1.22	-0.2759***	-1.35
Constant	8.6652***	29.22	8.5698***	30.57

term				
λ	0.7275[***]	7.89	0.7095[***]	7.27
R2 Adj	0.9421		0.9447	

Note: * represents 10% significance level; ** represents 5% significance level; *** represents 1% significance level.

3.3. Summary of broad and narrow arguments

Whether it is broad green finance or narrow green finance, the empirical results show that the scale of green finance has a positive correlation with economic growth, indicating that green finance has a significant role in promoting economic growth and development. The promotion effect of green finance on the globalization of economy and growth also fully reflects the globalized green financial resources flowing into the field of energy conservation and environmental protection while increasing social wealth. The development of green finance has not only ecological benefits but also social and economic benefits.

The development of green finance is a good thing to accomplish in one fell swoop. Especially in the new normal stage, green development and finance can not only effectively promote the upgrading of China's industrial structure but also effectively achieve the rapid expansion of the total national economy. On the other hand, relative to the regression coefficient of generalized green finance, the promotion effect of narrow green finance on economic growth has been reduced. This shows that the use efficiency of green financial resources provided by market players needs to be further improved. The estimation coefficients of other variables are basically consistent with the estimation results of the generalized green financial space panel measurement model. This also shows that the empirical research has strong robustness from another aspect.

4. Suggestions on countermeasures for green finance to promote economic growth

4.1. Improvement of the guarantee mechanism for green financial development

A perfect and sound guarantee mechanism is the cornerstone for the stable and long-term development of green finance. At the macro level, a long-term financial development mechanism with "green finance as the core" should be determined and adhered to. In constructing the micro-security mechanism, some detailed policies that are conducive to the sustainable development of green finance should be gradually implemented. On the one hand, preferential policies on income tax and value-added tax were introduced to promote the green financial business of financial institutions at all levels. At the same time, gradually introduce a discount mechanism for financial institutions' green investment and financing projects, and encourage financial institutions at all levels to develop green financial services. On the other

hand, establish a green financial accountability system in a timely manner. After green finance rises to the national development strategy, various preferential measures will be introduced accordingly, and the limited rationality and opportunistic behavior of micro-subjects will increase the risk of green financial fraud and rent-seeking. Faced with this challenge, the corresponding green financial accountability and accountability mechanism should be established early.

4.2. Improve the organization structure of green finance

First of all, domestic financial institutions at all levels should gradually complete "green packaging", build an exclusive green financial management service institution, and then quickly develop green financial business. Secondly, construct intermediary institutions such as credit evaluation and certification of green financial development, and actively provide scientific evaluation for green development initiatives of financial institutions at all levels. Third, increase the construction of a green financial talent system. Financial institutions at all levels should gradually build a professional and efficient team of Chinese green finance professionals through various channels such as "external introduction and internal training" and "international exchanges". In addition, the construction of green financial infrastructure system should also be accelerated, such as: the construction of green financial development information platform, the construction of green financial development star management system, etc.

4.3. Innovative green financial product tools

While promoting the expansion of green finance, we must also pay attention to the improvement of the quality of green finance, that is, to avoid low-level simple imitation in the development of green finance. The expansion of the amount of green finance requires government guidance and policy incentives, and the improvement of the quality of green finance requires not only government regulation but also a sound market environment. The singleness of financial instruments is the main manifestation of the low degree of marketization of green finance in China. In the subsequent development, we should continue to innovate and promote the development of green bonds, green stocks, and green insurance markets, and mobilize social capital to participate in green investment to the greatest extent. At the same time, through the continuous introduction of technological elements to innovate green financial product tool system. Efforts will be made to integrate a series of innovative information technologies such as big data, "Internet +" and cloud computing into the development of China's green financial innovation products and financial instruments, so as to enhance the advanced nature and sense of the times of green financial product instruments.

5. Conclusion

This paper mainly uses the spatial panel measurement analysis model to carry

out in-depth empirical observation and analysis of the impact of the green energy-saving finance on the economic situation and its growth effect. Has a significant promotion effect. (2) Compared with the generalized green finance, the promotion effect of narrow green finance on economic growth has been reduced. Although green finance has a significant role in promoting economic growth, this role is not strong. (3) Significantly different from the regression coefficient of green finance, the degree of nationalization and the scale of government investment have a positive and negative correlation with the growth and development of China's economy within the interval determined by the research sample. The above illustrates the positive significance of developing green finance from an empirical perspective, but China's green finance development still has a significant gap compared with some developed countries.

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