The impact of Two-way Direct Investment on Tax Revenue: An Empirical Analysis Based on Jiangsu Province

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Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

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ABSTRACT

Two-way direct investment is an important part of the open economic system. The financial pressure causes local governments to generate internal motivation to absorb more tax revenue. The research on the relationship between them is helpful for us to have a deeper understanding of the local government behavior in the new opening up pattern. This paper uses GMM estimation and panel threshold model to discuss the tax effect of two-way direct investment based on the municipal data of 13 cities in Jiangsu Province from 2010 to 2020. The results show that: first, increasing two-way direct investment can significantly increase local government tax revenue, and this effect is more significant in the region with higher degree of foreign direct investment and outward foreign direct investment. Second, with FDI as the threshold variable, the optimization of industrial structure will increase the tax revenue of the whole province and the central and northern regions of Jiangsu while inhibiting the tax revenue of southern Jiangsu. The investment in fixed assets will reduce the tax revenue in northern Jiangsu and help increase the tax revenue in the whole province and southern Jiangsu. Third, when OFDI is the threshold variable, improving economic development

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level, optimizing industrial structure, increasing fixed asset investment and per capita wage can promote the growth of tax revenue. Therefore, in today's free and open market economy, Jiangsu Provincial government should continue to formulate and improve relevant policies, ctively introduce foreign direct investment and encourage outward foreign direct investment.

Keywords: Two-way direct investment; tax revenue; influence; threshold model.

1. INTRODUCTION AND LITERATURE REVIEW

The report to the 19th National Congress called for "promoting a new pattern of all-round opening-up", adhering to the principle of "bringing in and going global", following the principle of extensive consultation, joint contribution and shared benefits, continuing to open wider to the outside world, and realizing the transformation from a big trading country to a strong trading country. Since the reform and opening up, the foreign trade of Jiangsu Province has grown steadily and rapidly. Its advantageous geographical position is easy to attract foreign investment, and it has rich experience in the development of two-way investment. Compared with domestic investment, FDI can introduce capital, advanced technology and management experience to promote the adjustment of industrial structure in the province. Both FDI inflow and OFDI outflow can promote the economic growth of the province, thus increasing the tax revenue of the local government. Two-way direct investment affects tax revenue by influencing local economy, national income and other aspects. Through the summary and analysis of domestic and foreign scholars' literature on the impact of two-way direct investment on local government tax revenue, we can find that scholars have not reached a unified conclusion, and there are mainly two different views:

Local governments increase two-way direct investment and implement preferential policies such as tax relief or government subsidies, which can inhibit the tax revenue of host countries. Lu Jian [1] used the spatial panel model to study and found that FDI had a negative effect on the growth of urban tax revenue, and the tax revenue of each city had a significant positive correlation with the surrounding cities based on the panel data of 221 Chinese cities from 2003 to 2011. Li Yongyou and Shen Kunrong [2] believed that the fiercer fiscal competition between jurisdictions would reduce the ability of jurisdictions to absorb foreign investment. Less FDI growth effect will also lead to differences in FDI growth effect

between jurisdictions. In addition, lower economic revenue in jurisdictions will increase reliance on non-tax revenue. Zhou Li 'an and Tao Jing [3] studies that foreign direct investors' investment in China depends to a certain extent on local government investment policies and trade controls. In order to attract foreign investment, local governments adopt active policies such as tariff reduction, lifting quantitative restrictions and increasing trade transparency, which to some extent reduce the tax revenue of local governments and increase the tax burden. Xiao Wen and Han Shenchao [4] believes that the national corporate income tax has a significant negative impact on OFDI, and the stronger the dependence on corporate income tax, the more difficult it is to carry out OFDI. Tian Suhua and Wang Xuan [5] studied the influencing factors of FDI inflow and outflow net of transnational investment based on 58 global economies, and the research showed that labor resources, administrative efficiency, tax revenue and other factors had a negative impact on the net inflow and outflow of FDI. At the same time, FDI and OFDI interact and promote each other. The increase of FDI inflow also contributes to the development of OFDI.

In order to attract foreign investment, local government introduced tax subsidies, loan subsidies and cash subsidies and other policies to promote the local government tax revenue. Zhang Qingjun and Sun Yajing [6] studied FDI's influence on foreign tax in our country by using vector auto-regression model, and found that whether in the long or short term, FDI promotes the growth of foreign tax revenue through foreign enterprise income tax and tariff based on the data from 2001 to 2013. However, the preferential tax policy of our country leads to the expenditure of high cost. It should improve the preferential tax policy of foreign enterprises scientifically. Hu Zaiyong [7] adopted the time series method to analyze the impact of foreign direct investment on China's tax revenue and found that foreign direct investment is conducive to the improvement of China's tax revenue. However, the excessive tax incentives which the government implements in order to attract foreign

investment also affect the tax revenue of our government. Therefore, it is necessary to reform the tax system by weighing the gains and losses of economic benefits. Xing Tiantian and Yu Yang [8] found that enterprises' foreign investment can promote economic growth. Our tax incentive policy should be used to promote investment, which will help us export excess production capacity and capital, promote economic growth and raise the domestic economy to promote government tax revenue. Yang Xiaoli [9] analyzed the impact of local government FDI tax competition on economic growth by using spatial econometric model and found that preferential tax policies adopted by local governments to attract FDI would promote local government tax revenue and increase national welfare level. Huang Xiang [10] analyzed the relationship between foreign direct investment and tax revenue in China by using VEC model and concluded that foreign direct investment played a promoting role in the growth of tax revenue in China in the long run. Yan Zhang [11] established a FDI tax competition model and analyzed the FDI competition between two local governments. It is found that the preferential tax policies adopted to attract foreign investment have a double effect on the tax revenue of the region.

Through summarizing the literature published by various scholars, it is found that there is still a need for further research on relevant issues. Some scholars unilaterally analyze the impact of FDI or OFDI on tax revenue. Even if the study on the impact of two-way direct investment on tax revenue, it is only a comprehensive analysis on the surface level, not a unified foreign direct investment and foreign direct investment on the same level and system in-depth analysis, in-depth exploration of its relationship with tax revenue. And the existing literature has never studied Jiangsu Province, which is representative in the field of two-way direct investment. As a matter of fact, the introduction of foreign investment and outbound investment are not carried out independently. They complement and promote each other, and only under their joint action can the economy grow rapidly. So at the same time to analyze it is more important. FDI and OFDI can promote economic development, and GDP growth has an effect on local government tax revenue, so is there a correlation between FDI and OFDI and the change of tax revenue? This paper, for the first time, puts foreign direct investment and outbound investment on the same level to investigate its

impact on tax revenue of Jiangsu Province, and makes an empirical analysis through dynamic panel model and threshold model. Taking FDI and OFDI as threshold variables, the paper conducts an in-depth study on the difference of the impact of two-way direct investment on tax revenue in Jiangsu Province. At present, international trade is facing the impact of the epidemic, and the global economic recession further affects the transnational investment of various countries. Under the background of new problems and challenges, the paper studies the influence of two-way direct investment on tax revenue of Jiangsu Province. It provides useful reference for Jiangsu to explore opening mode and adjust foreign investment policy in time under the new situation. In this paper, Jiangsu Province, which is a representative of transnational investment in China, is selected as the research object to study this issue deeply and investigate the impact of two-way investment on tax revenue in Jiangsu Province.

This paper is divided into four parts. The first part is introduction and literature review. The second part is the econometric model construction and data description, the third part is the empirical results and analysis. The fourth part is conclusion and revelation [3-9].

2. MEASUREMENT MODEL CONSTRUCTION AND DATA DESCRIPTION

2.1 Measurement Model Construction

2.1.1 Dynamic panel model

In order to investigate the effect of two-way direct investment on local government tax revenue, this paper constructs a dynamic panel model:

$$lnreve_{i,t} = \beta_0 + \alpha lnreve_{i,t-1} + \beta_1 lnfdi_{i,t} + \beta_2 lnofdi_{i,t} + \beta_3 econ_{i,t} + \beta_4 indus_{i,t} + \beta_5 fixi_{i,t} + \beta_6 lnwage_{i,t} + \eta_i + \mu_{i,t} \quad (1)$$

β_0 is a constant, i for individual, t is time. $\beta_1 \sim \beta_6$ represent the regression coefficients of each variable in the model respectively. Ƞi said fixed effects, $\mu_{i,t}$ represents the random residual term. Considering the impact of the tax revenue of the previous period on the current period, the first-order lag term of the explained variable is introduced into the explanatory variable. α is the regression coefficient of the first-order lag term of the explained variable.

2.1.2 Panel threshold model

The effect of foreign direct investment and outward foreign direct investment on regional tax revenue is multi-dimensional. Its influence may show different characteristics with the intensity level of two-way direct investment in different intervals, that is, there may be nonlinear relationship between variables. The threshold model can accurately estimate the threshold value and test the significance level. Therefore, this paper uses this method to test the threshold model affecting local tax revenue when FDI and OFDI are threshold variables respectively:

$$lnreve_{i,t} = \beta_0 + \alpha_1 lnreve_{i,t} \cdot I(lnfdi_{i,t} < \varepsilon_1) + \alpha_2 lnfdi_{i,t} \cdot I(lnfdi_{i,t} \geq \varepsilon_1) + \beta_1 econ_{i,t} + \beta_2 indus_{i,t} + \beta_3 fix_{i,t} + \beta_4 lnwage_{i,t} + \eta_i + \mu_{i,t}$$ (2)

$$lnreve_{i,t} = \beta_0 + \alpha_1 lnofdi_{i,t} \cdot I(lnofdi_{i,t} < \varepsilon_2) + \alpha_2 lnofdi_{i,t} \cdot I(lnfodi_{i,t} \geq \varepsilon_2) + \beta_1 econ_{i,t} + \beta_2 indus_{i,t} + \beta_3 fix_{i,t} + \beta_4 lnwage_{i,t} + \eta_i + \mu_{i,t}$$ (3)

Formula (2) and Formula (3) respectively represent the single threshold model of foreign direct investment and foreign direct investment. Where, lnfdi and lnofdi are threshold variables, ε_1 and ε_2 are threshold values, and I( ) is indicative function. When the threshold variable meets the conditions, the value is 1; otherwise, the value is 0. β_0 as constant, $\mu_{i,t}$, η_i fixed effects in the observation area.

2.2 Description of Main Variables and Data Sources

2.2.1 Explained variables

Local government tax Revenue. In this paper, data of local government tax revenue of 13 cities during 2010-2020 were obtained from the municipal statistical yearbook of Jiangsu Province. Taking the logarithm of the tax revenue and write it as the lnreve, in billions of dollars.

2.2.2 Core explanatory variables

① Foreign direct investment (FDI). Foreign investment through the form of tax to increase the local tax revenue, promote regional economic development. This paper selects the proportion of the actual utilization of foreign capital to the gross regional product of each city to measure the change of attracting foreign capital. ② Outward foreign direct investment (OFDI). This paper uses the proportion of total import and export volume and gross regional product to measure the change of this index.

2.2.3 Other control variables

① Industrial structure. After learning from the practice of Lu Jian and Yang Binyong [1], the tax revenue of local governments in China is mainly turnover tax, which mainly comes from the secondary industry and the tertiary industry, this paper uses the ratio of the sum of the secondary industry and the tertiary industry of each city and the GDP of each region to measure the change of industrial structure, and analyzes the impact of the change of industrial structure on the tax revenue of local governments. ② The level of Economic development. Considering that more developed regions have relatively strong infrastructure and human capital, it is easier to attract the inflow of FDI. Therefore, the GDP of each city is used to measure the level of economic development in this paper. In order to ensure the authenticity of data, the GDP deflator is used in this paper (GDP deflator = nominal GDP - real GDP). The gross regional product is one of the best indicators to reflect the economic development of a region. The tax revenue of local government is closely related to the economic development of the region, that is, with the rapid development of the economy, the tax revenue of the region will increase accordingly. ③ Fixed asset investment (Fix). This papper selects the proportion of fixed assets investment and regional GDP to measure the change of fixed assets investment. ④ The per capita Wage. The average salary of urban unit employees is selected to measure this index in this papper. In the empirical process, logarithms are taken to ensure the accuracy of regression estimation results.

Considering the availability of data, municipal panel data of 13 cities in Jiangsu Province from 2010 to 2020 are selected to make an empirical analysis of two-way direct investment and local government tax revenue. Among them, the local government tax revenue from the past years of China Tax Yearbook, other data from the Municipal Statistical Yearbook.

Table 1. Descriptive statistical results of variables

	variable	meaning	Sample size	Average value	Standard error	Minimum value	Maximum value
Explained variable	Reve	Local government tax revenue	143	0.089	0.074	0.0410	0.9038
Core explanatory variable	FDI	Foreign direct investment	143	0.0279	0.0319	0.0085	0.3833
	OFDI	Outward foreign direct investment	143	0.2710	0.3815	0.0522	1.2609
Control variable	Econ	Level of economic development	143	1.4624	0.2366	0.8743	2.1210
	Indus	Industrial	143	0.9735	0.0642	0.7992	1.2435
	Fix	Investment in	143	0.7048	0.2348	0.2455	1.4682
	lnWage	Per capita	143	11.0240	0.4075	10.0236	12.3047

*Note: The values in brackets are the t values estimated by the parameters. ** means pass the test of 1% significance level; ** means pass the test of 5% significance level; * means pass the test of 10% significance level*

3. EMPIRICAL ANALYSIS

3.1 Dynamic Panel Model

Variance inflation factor (VIF) of each variable shows that there is no multicollinearity problem. The results of Hausman's test show that fixed effects model should be used. Table 3 presents the estimation results of the dynamic system GMM model (SYS-GMM) and (DIF-GMM) of local government tax revenue and two-way direct investment in 13 cities of Jiangsu Province.

As can be seen from Table 2, two-way direct investment has a promoting effect on local government tax revenue. The lag of local government tax revenue of one period has a significant positive impact on current tax revenue, indicating that tax revenue is a cumulative and continuous dynamic process. The tax revenue of the previous period is conducive to increasing the tax revenue of the current period. The sargan test results of dynamic system GMM and differential GMM show that the two models have no rejection and meet the overrecognition condition. AR(1) and AR(2) test results are also ideal. It shows that the residual difference only has first order sequence correlation but not second order sequence correlation. The regression results show that the regression coefficient of two-way direct investment is significantly positive, indicating that two-way direct investment can significantly promote the growth of tax revenue, and local tax revenue will increase with the increase of two-way direct investment.

In order to attract foreign investment and promote opening-up, the government adopts preferential tax policies, subsidies and other policies to reduce some income, but foreign funds increase GDP growth and increase employment to make up for the loss of funds, which is conducive to increasing local tax revenue. The coefficient of economic development level is significantly positive at the significance level of 1%, indicating that local tax revenue will increase with economic development. The higher the level of economic development, the more local tax revenue. The coefficient of industrial structure and per capita wage is positive, indicating that optimizing industrial structure and increasing per capita wage will increase tax revenue.

Accelerating the optimization of the industrial structure will promote export trade, the development of export trade is conducive to raising the level of wages, thus increasing the local tax revenue.

To overcome the endogeneity problem, a dynamic panel model is used in this paper. Dynamic GMM includes differential GMM and system GMM. In the case of finite samples, the estimation deviation of system GMM is smaller and the efficiency is higher than that of differential GMM, so this paper focuses on the system GMM model. The empirical results show that for every 1% increase in FDI in a city, the average tax revenue will increase by 0.1538%. Every 1 percent increase in foreign direct investment increases average tax revenue by 0.1542 percent. Foreign direct investment is more effective than foreign direct investment in promoting local tax revenue growth. When economic development level, industrial structure and per capita wage increase by 1%, average tax revenue will increase by 0.2385%, 0.7273% and 0.6182% respectively. A 1 per cent increase in fixed asset investment reduces average tax revenues by 0.3146 per cent. Fixed asset investment can improve tax revenue, but it is easy to be affected by external macroeconomic changes. When trade friction or domestic and foreign economic downturn, will reduce fixed investment investment, thus affecting tax revenue. Over-reliance on investment will lead to the imbalance of economic development, and it is easy to cause overcapacity in some industries, leading to the imbalance of supply and demand, which requires the government to spend more funds to adjust the industrial structure and change the economic development model, and the government's expenditure is based on tax revenue, which in turn reduces the tax revenue.

3.2 Panel Threshold Model Analysis

Panel regression results show that outward foreign direct investment and foreign direct investment have linear effects on government tax revenue. In order to test whether there is a nonlinear relationship between variables, the panel threshold regression model proposed by Hansen is adopted to further study the nonlinear relationship between two-way direct investment and local tax revenue. The threshold test results are shown in Table 3.

Table 2. Analysis of baseline regression results

Variable	Revei t-1	lnFDI	lnOFDI	Econ	Indus	Fix	lnWage	Sarg an 检 验	AR(1)	AR(2)	Sample number
SYS-GMM	0.5579***	0.1538***	0.1542***	0.2385***	0.7273	-0.3146***	0.6182***	0.3476	0.0423	0.4526	143
	(23.87)	(7.81)	(13.7)	(14.6)	(1.18)	(-10.42)	(18.89)				
DIF-GMM	0.6174***	0.0508***	0.1826***	0.1856***	6.0548***	-0.1756***	0.3521***	0.8700	0.0328	0.683	143
	（27.54）	（8.94）	（22.43）	(12.47)	（18.67）	（-6.54）	(15.02)				

*Note: Values in brackets are estimated t values of parameters. ** indicates passing the 1% significance level test. ** indicates passing the test at the 5% significance level. * indicates passing the test at the 10% significance level*

Table 3. Test results of threshold effect

Threshold variable	Area	Model	F-value	p-value	Threshold estimate	The 1% threshold level	The 5% threshold level	The 10% threshold level
FDI	Jiangsu Province	Single threshold	30.56**	0.0300	-2.2587	41.5645	28.4050	24.9735
		Double threshold	8.42	0.7867	-1.4344	53.2728	33.0945	24..6725
	Southern Jiangsu region	Single threshold	14.06	0.5167	-1.5449	38.5470	30.1422	26.8413
	Central and northern Jiangsu region	Single threshold *	37.87**	0.0000	-2.2686	22.7806	19.3780	16.7482
		Double threshold	9.17	0.3457	-1.7548	21.0458	17.6285	15.2435
OFDI	Jiangsu Province	Single threshold	27.26**	0.0200	-2.7945	33.8674	21.4333	17.8724
		Double threshold	13.00	0.2200	-4.2063	25.8905	20.6554	17.4631
	Southern Jiangsu region	Single threshold	27.67**	0.0100	-3.8740	26.6788	21.3425	16.7562
		Double threshold	11.63	0.1100	-3.3465	17.6542	13.8753	12.6521
	Central and northern Jiangsu region	Single threshold	15.47	0.1243	-4.2453	28.2256	20.1434	17.5563

3.2.1 Threshold effect of FDI

As can be seen from Table 4, when FDI is the threshold variable, a single threshold in Jiangsu Province passes the significance test of 5%. The threshold effect is not significant in southern Jiangsu. There is a single threshold passing 1% significance level in central and northern Jiangsu. The estimated threshold values of Jiangsu Province are -2.2587 and -1.4344, the estimated threshold values of southern Jiangsu Province are -1.5449, and the estimated threshold values of central and northern Jiangsu Province are -2.2686 and -1.7548.

On the whole, foreign direct investment plays an important role in the economic growth of the host country. On the one hand, FDI can directly and effectively fund local economic construction through capital accumulation; on the other hand, FDI can inject vitality into local economic construction through the introduction of advanced technology, management experience and human resources, so as to enhance local economic development, increase people's income, and thus increase local government tax revenue. As can be seen from the chart analysis, when the economic development level increases by 1%, the average tax revenue of the whole Jiangsu Province will increase by 0.4867%, the average tax revenue of southern Jiangsu is slightly higher than that of the whole province, and the average tax revenue of central and northern Jiangsu will increase by 0.4713%.

From the perspective of FDI location choice, regional economic level determines whether it can attract foreign direct investment to a certain extent. Cities in southern Jiangsu have highly developed economy, large market consumption potential, and mature operation capacity in all aspects, which is conducive to attracting foreign investment to set up factories, mergers and acquisitions, and establish subsidiaries in southern Jiangsu. The resident foreign-funded enterprises shall pay certain commercial tax to the south of Jiangsu, so as to increase the tax revenue of the south of Jiangsu. When the industrial structure is optimized by 1%, the tax revenue of Jiangsu Province increases by 2.6156%. Meanwhile, the tax revenue of central and northern Jiangsu also increases by 2.3487%, while the tax revenue of southern Jiangsu decreases by 0.058%. It may be that in order to encourage high-tech enterprises to continue to innovate and upgrade and optimize the industrial structure, the local government in

southern Jiangsu Province implemented preferential policies such as tax reduction and exemption for enterprises, which resulted in reduced tax revenue. It may also be that capital-intensive industries and technology-intensive industries in southern Jiangsu have eliminated a large number of labor forces, and the unemployed labor forces cannot pay taxes, which has a negative impact on the local tax revenue. The investment in fixed assets can improve the tax revenue of Jiangsu Province and southern Jiangsu Province. For every percentage point increase in investment, the tax revenue of Jiangsu Province and Southern Jiangsu Province increases by 0.2432% and 0.4651 respectively, while the tax revenue of central and northern Jiangsu Province decreases by 0.0014%. The possible explanation is that the economy of southern Jiangsu is more developed than that of central and northern Jiangsu. Southern Jiangsu gathers many fixed asset investment industries such as real estate industry, transportation industry and engineering construction, which is conducive to attracting investment in the field of fixed assets. Massive investment in the region has boosted local tax revenues. On the other hand, the economic level of central and northern Jiangsu is lower than that of southern Jiangsu, and the amount of natural fixed assets investment is small, thus reducing the tax revenue. Per capita wage has an extremely important positive impact on tax revenue. Firstly, the increase of per capita wage will also increase personal income tax; secondly, the increase of per capita wage will promote consumption and thus increase tax revenue.

3.2.2 Threshold Effect of OFDI

With OFDI as the threshold variable, Jiangsu Province and southern Jiangsu Province only passed the single threshold of 5% significance. The estimated threshold of Jiangsu Province is -2.7945 and that of southern Jiangsu Province is -3.8740. Table 5 shows the estimated results of the threshold model.

As can be seen from the analysis of Table 5, OFDI has a promoting effect on local tax revenue. It may be that export can increase product output, promote product innovation and upgrade, so more labor force is needed. Rising employment also raises wages. Residents contribute to the increase of government tax revenue by paying individual income tax. It may also be due to the overproduction in the domestic market. Export can stimulate the external

demand, coordinate the domestic oversupply and consumption, promote the healthy development of the economy, and then promote the growth of GDP and increase the tax revenue.

The results show that each control variable has a positive impact on the local tax revenue, but there are some differences in the impact. Because each city has different economic development and industrial base, it will face different changes in industrial structure adjustment and optimization, economic growth driven by investment in fixed assets, and resident per capita income. As a result, tax revenue of each city presents regional and growth differences. To increase tax revenue, promote steady growth of tax revenue and expand tax sources and tax base, a local government should, in the final analysis, promote rapid and sustainable economic development in all aspects. Among them, the proportion of innovation and technology and the development of real estate industry can be improved by optimizing the industrial structure. Such high-tax industries can quickly increase the tax revenue level of local governments. At the same time, Jiangsu Province should expand the opening, actively introduce foreign investment, promote domestic enterprises to invest abroad, improve various tax preferential policies, improve the utilization rate of foreign investment for urban construction, promote GDP growth, and thus increase tax revenue.

Table 4. Estimated results of FDI panel threshold model

variable	Jiangsu Province	Southern Jiangsu	Central and northern Jiangsu
Econ	0.4867*** (15.21)	0.4973*** (10.87)	0.4713*** (12.56)
Indus	2.6154*** (5.89)	-0.0580 (-0.72)	2.3487*** (4.05)
Fix	0.2432*** (5.45)	0.4651*** (6.38)	-0.0014 (-0.013)
LnWage	1.2397*** (45.7)	1.2391*** (30.45)	1.3524*** (34.89)
FDI-1	0.0243* (1.85)	0.0805*** (3.30)	-0.0207 (-1.43)
FDI-2	0.0022 (0.16)	0.0431* (1.67)	-0.4526*** (-2.85)
FDI-3	-0.0135 (-0.89)		

*Note: The numbers in brackets are T-values, *** represents p<0.01, ** represents p<0.05, and * represents p<0.1. Fdi-1 ~FDI-3 are the coefficients of threshold variables FDI in different threshold intervals*

Table 5. Estimated results of OFDI panel threshold model

Variable	Jiangsu Province	Southern Jiangsu	Central and northern Jiangsu
Econ	0.4385*** (14.09)	0.4121*** (10.87)	0.4321*** (12.03)
Indus	2.8261*** (5.83)	0.2277 (0.38)	2.2763*** (4.05)
Fix	0.0834** (1.87)	0.3147*** (4.51)	0.2325 (0.42)
LnWage	1.2435*** (49.85)	1.1925*** (38.65)	1.2924*** (39.35)
OFDI-1	0.0893*** (4.05)	0.0475 (0.91)	0.1175*** (4.53)
OFDI-2	0.1245*** (5.68)	-0.0351 (-0.78)	0.1721*** (7.01)
OFDI-3	-0.0745** (-1.74)		

*Note: The numbers in brackets are T-values, *** represents p<0.01, ** represents p<0.05, and * represents p<0.1. Ofdi-1 ~ ofDI-3 are the coefficients of threshold variables OFDI in different threshold intervals*

4. SUMMARY AND RECOMMENDATIONS

4.1 Summary

This paper uses GMM estimation and panel threshold model to discuss the tax effect of two-way direct investment based on the municipal data of 13 cities in Jiangsu Province from 2010 to 2020. The results show that: first, increasing two-way direct investment can significantly increase local government tax revenue, and this effect is more significant in the region with higher degree of foreign direct investment and outward foreign direct investment. Second, with FDI as the threshold variable, the optimization of industrial structure will increase the tax revenue of the whole province and the central and northern regions of Jiangsu while inhibiting the tax revenue of southern Jiangsu. The investment in fixed assets will reduce the tax revenue in northern Jiangsu and help increase the tax revenue in the whole province and southern Jiangsu. Third, when OFDI is the threshold variable, improving economic development level, optimizing industrial structure, increasing fixed asset investment and per capita wage can promote the growth of tax revenue. Therefore, in today's free and open market economy, Jiangsu Provincial government should continue to formulate and improve relevant policies, actively introduce foreign direct investment and encourage outward foreign direct investment.

4.2 Recommendations

4.2.1 Jiangsu should actively introduce foreign capital and foreign investment

On the one hand, under the background of highly developed free trade, Jiangsu Province should make greater efforts to open the door of trade, constantly improve the environment for foreign investment, and actively introduce foreign capital, advanced technology and management talents. It can be used as a key force to break through the bottleneck of economic development in the economically developed south of Jiangsu Province. For central and northern Jiangsu, where the economy is relatively weak, resources integration advantages can be provided, preferential policies can be formulated, and foreign capital inflow and agglomeration can be actively guided, which will be conducive to rapidly improving the local economic level and thereby increasing the local tax revenue. On the other hand, South Jiangsu and North Jiangsu should adopt foreign investment or foreign investment policies appropriately and reasonably

according to their own development situation, analyze regional development advantages and disadvantages, adjust to local conditions, make full use of foreign investment and foreign investment to improve local economy, and give full play to its role in increasing tax revenue.

4.2.2 The preferential tax policies of Jiangsu Province should be tailored to local conditions and focused

In the south of Jiangsu, which has advantages in technology and capital, the focus of tax incentives should be placed on promoting the progress of local production technology and encouraging scientific and technological innovation. The preferential tax policies in northern Jiangsu should focus on how to attract funds to infrastructure construction and energy development, and constantly optimize the industrial structure. In order to attract more foreign investment, various preferential policies such as tax reduction, exemption and free land transfer should be considered. However, this method should not be excessively abused, as improper implementation will cause the loss of local government financial resources. Jiangsu Province should formulate different preferential policies according to different industries. For particularly weak industries, more preferential policies and government support are needed.

4.2.3 The focus of tax preferential policy in Jiangsu Province should be changed to support objects

With strong economic strength, Southern Jiangsu has enough attraction and experience to attract foreign investment and promote outward foreign direct investment. The preferential tax policy should be shifted to the economic level of the slightly weaker northern Jiangsu area. The government should guide the inflow of foreign capital from south to north, so that the central and northern areas of Jiangsu can obtain strong support of capital and technology, shorten the economic gap between the south, the central and the North of Jiangsu, which coordinates the balanced economic development of the whole province. It should also continue to improve the relevant laws on the introduction of foreign investment and foreign investment, so as to ensure that there are laws to follow, and actively build industrial parks to give full play to the agglomeration driving effect. It should make rational use of tax revenue, raise per capita wages, and actively attract talents.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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