

Research on the Impact of High-Speed Railway on County Economic Growth in Northern Jiangsu Province Based on DID Model

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Abstract: The development of county economy is the top priority of rural revitalization. This paper selects the data of 17 counties in northern Jiangsu from 2010 to 2020, and uses the Difference in Difference (DID) model to measure the impact of high-speed rail opening and operation on the county economy in northern Jiangsu from four aspects: economic density, population density, location entropy of the tertiary industry, and market potential. At the same time, the negative impact of the COVID-19 was eliminated, which further verified the robustness of the results of this paper. The research results showed that the opening of high-speed railway had no significant impact on the economic density and population density of Subei County, had a significant role in promoting the market potential, but had a significant inhibitory effect on the location entropy of the tertiary industry; This paper suggests strengthening the node effect by actively integrating into the regional network; Innovate the development path and strengthen the county characteristics; Improve basic support and enhance development potential; Improve the coordination and cooperation mechanism, promote regional common development and other ways to enhance the economic effect brought by the opening of high-speed railway.

Keywords: High-Speed Rail; County Economy; DID

1. Introduction

North Jiangsu, short for northern Jiangsu, includes five prefecture-level cities (Xuzhou, Lianyungang, Suqian, Huai 'an and Yancheng) and has jurisdiction over 17 municipal districts, 3 county-level cities and 17 counties. In 2011, the opening of the Beijing-Shanghai high-speed Railway made Xuzhou enter the "high-speed railway era", which also marked that northern Jiangsu has officially entered the high-speed railway era since then. North Jiangsu is located in the north of Jiangsu Province, located in the Yangtze River Delta, is one of the important parts of China's coastal economic belt. In recent years, Jiangsu has made great efforts to build high-speed railway lines in northern Jiangsu where the economy is relatively underdeveloped. By the end of 2020, all the five cities in northern Jiangsu have opened high-speed railway lines, fully entering the era of high-speed railway. As a modern mode of transportation, high-speed railway not only improves the transportation capacity of northern Jiangsu, but also profoundly affects the development of regional economy in northern Jiangsu. ^[1]

County economy is an important cornerstone to support the high-quality economic and social development of Northern Jiangsu. Will the construction of high-speed railway cause agglomeration effect or siphon effect on the county economy of Northern Jiangsu? Will it enhance county economic growth or restrain county economic growth? ^[2] The research on these issues is of great practical significance to the county economy in northern Jiangsu.

2. Research design

2.1 Analyze the model

This paper selects the data of 17 counties from 2010 to 2020, including Fengxian, Peixian, Suining, Donghai, Guanyun, Guannan, Lianshui, Xuyi, Jinhu, Xiangshui, Binhai, Funing, Sheyang, Jianhu, Shuyang, Siyang and Sihong, and takes the opening and operation of high-speed railway as the starting point. The cities that have been opened by high-speed railway are classified as the processing group, while the cities that have not been opened by high-speed railway are taken as the control group^[3]. The DID model is adopted to measure the impact of the opening of high-speed railway on the county economy of northern Jiangsu Province from four aspects: economic density, population density, location entropy of the tertiary industry and market potential. If a high-speed railway is opened in the region in the same year, the value is 1; otherwise, it is 0^[3]. At the same time, T_{it} variable is introduced to solve the time difference of regional opening of high-speed railway, and a multi-period differential model is constructed to demonstrate the impact of high-speed railway opening on county economy^{[3][4]}:

$$Y_{it} = \beta_0 + \beta_1 * T_{it} + \sum_j \beta_j * X_{it} + \gamma_t + \mu_i + \varepsilon_{it} \quad (1)$$

Among them, Y_{it} is the economic agglomeration index of a county i of 17 counties in northern Jiangsu in year t ; As the dummy variable of whether the county opens high-speed railway in the current year or not, the value of T_{it} is 1 in the opening year and all subsequent years; otherwise, it is 0. X_{it} was the other control variable affecting the economic agglomeration index of the county in that year; γ_t is the time trend effect of the county in the same year. μ_i is the urban fixed effect in this county. β_1 is the dummy variable coefficient of the county, that is, the effect coefficient of high-speed rail. β_j is the coefficient of other control variables; ε_{it} is a random disturbance.^{[3][5]}

The investment, construction and operation of high-speed railway will improve the economic driving effect and radiation capacity of the region, and bring about different impacts on different industries, among which the modern service industry is more obvious, followed by the secondary industry and the primary industry^[3]. Therefore, economic development level, fixed asset investment level and industrial structure are selected as control variables of economic attributes^[3] to control the influence of other factors. High-speed rail has a huge impact on economic development, industrial development, income level, science and technology education, ecological environment, etc.^[3], and promoted urbanization development to a large extent. Therefore, urban public service level, urbanization level and urban population are selected as the control variables of urban attributes.^{[3][5]} Therefore, the model adopted in this paper is:

$$Y_{it} = \beta + \beta_1 * T_{it} + \beta_2 * P_{it} + \beta_3 * urb_{it} + \beta_4 * eco_{it} + \beta_5 * inv_{it} + \beta_6 * ups_{it} + \beta_7 * pis_{it} + \gamma_t + \mu_i + \varepsilon_{it} \quad (2)$$

Where, P_{it} is the urban public service level of a county i in the 17 counties of Northern Jiangsu in the year t (PFE_{it}/GDP_{it} , PFE_{it} is the fiscal expenditure of the county in the year); urb_{it} is the urbanization level of the county in year t ; eco_{it} is the economic development level of the county in t years (logarithm of GDP_{it}); inv_{it} is the fixed asset investment level of the county in the current year (logarithm of fixed asset investment); ups_{it} is the urban population size of a county in northern Jiangsu Province in year i in t ; pis_{it} is the proportion of secondary and tertiary industry structure of a county in northern Jiangsu in year t ($GDP3_{it}/GDP2_{it}$); β_m ($m=0,1,\dots$) is the coefficient of the above variables, used to measure the effect of these variables^{[3][5]}.

The economic agglomeration index of a county describes the changes of economic activities in a county, such as economic growth, labor market, urban internal market potential and industrial structure^[3]. In order to fully reflect the degree of economic agglomeration in a county, population density, economic density, location entropy of the tertiary industry and market potential were selected to describe the degree of economic agglomeration in a county in northern Jiangsu^{[3][5]}.

Population density DP , which describes the population agglomeration of counties in Northern Jiangsu under the influence of high-speed rail, reflects the change of the population size of a county in Northern Jiangsu from 2010 to 2020^[3]. The calculation formula is shown in Equation (3):

$$D_{P_{it}} = Prp_{it} / area_i \quad (3)$$

Where, DPit is the population density of a county in northern Jiangsu during the period i and t; Prpit is the number of resident population of a county i in northern Jiangsu during t period; areai is the area of a county i in Northern Jiangsu.^{[3][5]}

Economic density ED represents the change of economic activity efficiency per unit area of land in each county of northern Jiangsu under the influence of high-speed railway from 2010 to 2020^{[3][5]}. The calculation formula is shown in Equation (4) :

$$E_{Dit} = GDP_{it} / area_i \quad (4)$$

Where: EDit is the economic density of a county i in northern Jiangsu during the period t; GDPit is the GNP of a county i in northern Jiangsu at t; areai is the area of city i.

Since the service industry is most obviously affected by the change of transportation location conditions, the location entropy of the service industry, namely the location entropy of the tertiary industry Q3, is used to represent the specialization degree of the tertiary industry in the counties of northern Jiangsu under the influence of high-speed railway^[3]. The calculation formula is shown in Equation (5) :

$$Q_{3it} = (GDP_{3it} / GDP_{it}) / (GDP_{3t} / GDP_t) \quad (5)$$

Where, Q3it is the location entropy of the tertiary industry in the period t of a county i in northern Jiangsu; GDP3it refers to the output value of tertiary industry when i was at t in a county in northern Jiangsu; GDPit is the GNP of a county i in northern Jiangsu at t; GDP3t is the output value of tertiary industry of 17 counties in northern Jiangsu at t; GDPt is t, gross domestic product of 17 counties in Northern Jiangsu.^{[3][5]}

MP of urban market potential represents the market purchasing ability of each county in northern Jiangsu. The calculation formula is shown in Equation (6) :

$$MP_{it} = \left[S_{it} / \left(\frac{2}{3} \right) \right] * \sqrt{\frac{area_i}{\pi}} \quad (6)$$

Where, MPit is the market potential of a county i in northern Jiangsu during the period of t; Sit is the total retail value of social sales products in a county in northern Jiangsu at the time of t; areai is the area of a county i in Northern Jiangsu.^{[3][5]}

2.2 Data sources and descriptions

The data of economic development indicators of each county are mainly derived from Jiangsu Statistical Yearbook (2011-2021) released by Jiangsu Province, Xuzhou Statistical Yearbook (2011-2021), Lianyungang Statistical Yearbook (2011-2021), Huai 'an Statistical Yearbook (2011-2021), Yancheng Statistical Yearbook (2011 ~ 2021), Suqian Statistical Yearbook (2011 ~ 2021), National Economic and social development statistical bulletins and government work reports of 17 counties (2011 ~ 2021). Table 1 is descriptive statistics of main variables.

Table 1 Indicators and descriptive statistics of the differential model

VARIABLES	Indicator description	mean	sd	min	max	N
D_E	Economic density / (trillion yuan · km ²)	0.342	0.653	0.0619	4.449	187
D_P	Population density / (10000 persons · km ²)	0.0675	0.101	0.0212	0.798	187
R_3	Location entropy of tertiary industry	0.877	0.226	0.632	2.931	187
MPI	Internal market potential	0.447	0.29	0.091	1.664	187
$urban$	Urbanization level /%	50.35	8.013	21.9	62	187
inv	Investment level of fixed assets /%	5.421	0.48	4.225	6.504	187
peo	Urban population / 10000	4.603	0.363	3.533	5.293	187
$stru$	industrial structure	0.939	0.188	0.562	1.356	187

Source: according to the statistical yearbook of Jiangsu Province from 2011 to 2021 and the statistical bulletin of national economic and social development of counties, based on Stata 14.

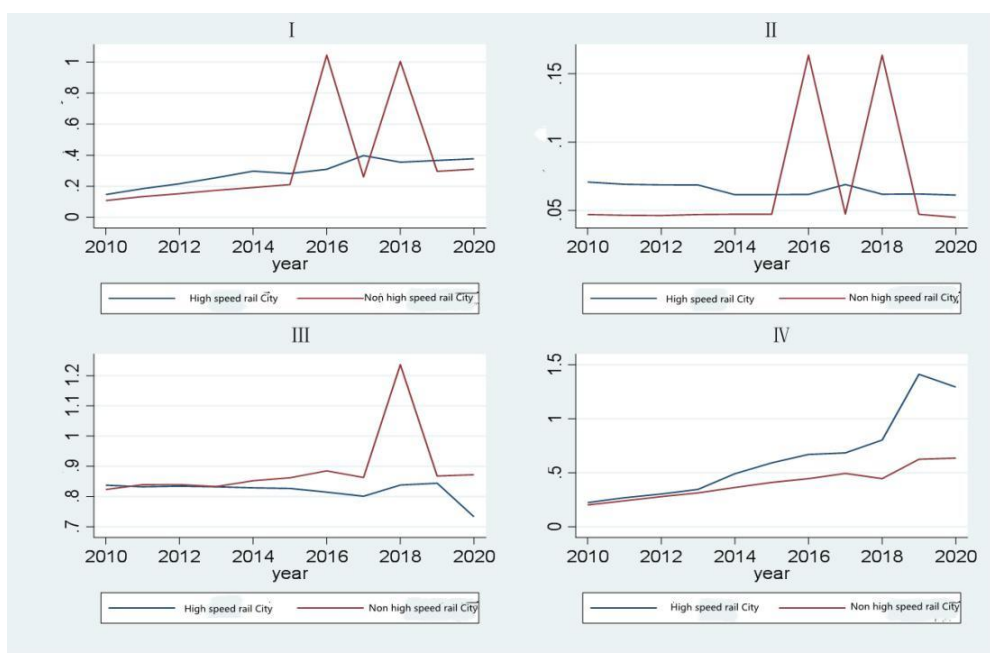
3. Evaluation results of the impact of high-speed railway opening on the economic growth of counties in Northern Jiangsu

3.1 Parallel trend test

The important premise of DID assessment was that the treatment group and the control group had the same trend before the policy occurred, that is, if there was no policy impact of the opening of high-speed rail, there would be no systematic difference in the change trend of economic agglomeration index between high-speed rail cities and non-high-speed rail cities. Since the high-speed railway in Xuzhou City was opened in June 2011, the high-speed railway in Huai 'an, Suqian and Yancheng was basically opened at the end of 2019, and the high-speed railway in Lianyungang was opened at the end of 2020, the three counties of Xuzhou were selected as the treatment group, and the other areas were selected as the control group (Table 2). Figure 1 shows the trend changes of population density, economic density, location entropy of the tertiary industry and market potential of the experimental group and the control group before and after the opening of high-speed railway^[3]. It can be found that the change trends of the treatment group and the control group are basically the same before the opening of high-speed railway, that is, the assumption of parallel trend is satisfied.

Table 2 Sample counties and descriptions of high-speed trains

Group	No.	County
Processing group	3	Fengxian, Peixian, Suining County
Control group	14	Donghai County, Guyun County, Gunan County, Lianshui County, Xuyi County, Jintu County, Xiangshui County, Binhai County, Funing County, Sheyang County, Jianhu County, Shuyang County, Siyang County, Sihong County



(I) economic density test; (II) population density test; (III) location entropy test of tertiary industry; (IV) market potential test

FIG. 1 Parallel trend test between experimental group and control group

3.2 Preliminary empirical analysis

Table 3 is the estimated results of the DID model with economic density, population density, location entropy of the tertiary industry and market potential as the explained variables. In order to show the robustness of the regression results, this paper adopts the

step-to-step regression method. In the columns (1), (3), (5) and (7), on the basis of controlling the fixed effect at the county level and the fixed effect at the time, only the policy impact of the opening of high-speed rail is added. In the columns (2), (4), (6) and (8), We further add control variables such as urbanization level, fixed asset investment, population size and industrial structure to obtain regression results in columns (1) - (8).

Table 3 Regression results of high-speed railway opening on economic agglomeration

VARIABLES	-1	-2	-3	-4	-5	-6	-7	-8
	$D_{\bar{x}}$	$D_{\bar{x}}$	D_p	D_p	$R_{\bar{x}}$	$R_{\bar{x}}$	MPI	MPI
<i>did</i>	-0.112 (-1.33)	0.147 -0.98 (-2.09)	-0.029* (-2.09)	0.009 -0.43 (-1.64)	-0.091*** (-3.17)	-0.077** (-2.20)	0.239*** -3.47	0.219** -2.45
<i>urban</i>		-0.013* (-1.99)		-0.002 (-1.64)		0.001 -0.65		-0.004 (-1.17)
<i>inv</i>		0.537* -1.98		0.082* -1.76		-0.171* (-1.84)		-0.137 (-1.47)
<i>peo</i>		-0.748 (-0.20)		0.123 -0.23		1.21 -1.21		1.189 -0.9
<i>stru</i>		1.868** -2.22		0.299* -2.08		0.377** -2.64		-0.623** (-2.15)
Constant	0.115* -1.83	0.154 -0.01	0.051*** -5.02	-1.04 (-0.40)	0.826*** -41.26	-4.249 (-0.89)	0.206*** -9.09	-3.981 (-0.64)
County level fixed effect	Y	Y	Y	Y	Y	Y	Y	Y
Time fixed effect	Y	Y	Y	Y	Y	Y	Y	Y
Observations	187	187	187	187	187	187	187	187
<i>Adj R</i> ²	0.151	0.212	0.104	0.163	0.135	0.166	0.615	0.67

Note: ***, ** and * respectively indicate that the statistical significance level of the test is 1%, 5% and 10%, and the t value adjusted by robust standard error is in brackets.

3.2.1 Economic density results

The results in Table 3 show that, no matter whether control variables are added or not, the opening of high-speed rail has no obvious influence on the estimated coefficient of economic density in counties of northern Jiangsu. From the perspective of control variables, the estimated coefficient of urbanization level on the economic density of counties in northern Jiangsu is 0.013, which is significant at the significance level of 10%, indicating that the improvement of urbanization level reduces the economic density of counties in northern Jiangsu. The estimated coefficient of fixed asset investment on the economic density of counties in northern Jiangsu is 0.537, which is significant at the significance level of 10%, indicating that fixed asset investment promotes the improvement of the economic density of counties in northern Jiangsu, and the increase of fixed asset investment is conducive to the improvement of the GDP of counties in northern Jiangsu, thus improving the economic density of counties in northern Jiangsu^[6]. The estimation coefficient of population size on economic density is not significant, indicating that population size has less obvious influence on economic density in northern Jiangsu. The estimated coefficient of industrial structure on economic density is 1.868, and it is significant under the significance level of 5%, indicating that the increase of industrial structure level is conducive to improving the economic density of counties in northern Jiangsu.

3.2.2 Results of population density

The results in Table 3 show that when control variables are not added, the estimated coefficient of the high-speed railway opening policy on the population density of the counties in northern Jiangsu is significantly negative at the significance level of 10%, indicating that the high-speed railway opening policy reduces the population density of the counties in northern Jiangsu, while the estimated coefficient of the high-speed railway opening policy on the population density of the counties in northern Jiangsu is not significant after the control variables are added^[7]. This indicates that, when other factors do not change, the high-speed railway opening policy has no significant impact on the population density of the counties in northern Jiangsu compared with the counties in the non-high-speed railway opening. From the perspective of control variables, the estimated coefficient of urbanization level on the population density of counties in northern Jiangsu is not significant, indicating that the improvement of urbanization level has no significant impact on the population density of counties in northern Jiangsu. The estimated coefficient of fixed asset investment on the population density of

counties in northern Jiangsu is 0.082, which is significant at the significance level of 10%, indicating that fixed asset investment is conducive to the improvement of population density in counties in northern Jiangsu. The estimation coefficient of population size on population density in counties of northern Jiangsu Province is not significant, indicating that population size has no significant influence on population density in counties of northern Jiangsu Province. The estimated coefficient of industrial structure on the economic density of counties in northern Jiangsu is 0.299, and the performance is significant at the significance level of 10%^[8], indicating that the increase of industrial structure is conducive to the improvement of population density.

3.2.3 Location entropy of the tertiary industry

The results in Table 3 show that when control variables are not added, the estimated coefficient of tertiary industry location entropy in counties of North Jiangsu after the opening of high-speed railway is -0.091, which is significant at the 1% significance level, indicating that the opening of high-speed railway will reduce the tertiary industry location entropy in counties of North Jiangsu. After the addition of control variables, The estimated coefficient of high-speed rail opening policy on the location entropy of the tertiary industry is -0.077, which is still significant at the significance level of 5%, indicating that, when other factors remain unchanged, the high-speed rail opening policy has a significant inhibitory effect on the location entropy of the tertiary industry compared with non-high-speed rail opening cities. From the perspective of control variables, the estimated coefficient of urbanization level on the location entropy of the tertiary industry is not significant, indicating that the improvement of urbanization level has no significant impact on the location entropy of the tertiary industry. The estimated coefficient of fixed asset investment on the location entropy of the tertiary industry in the counties of northern Jiangsu is -0.171, which is significant at the significance level of 10%^[3], indicating that fixed asset investment is not conducive to the improvement of the location entropy of the tertiary industry in the counties of northern Jiangsu. The estimated coefficient of population size on the location entropy of the tertiary industry in the counties of northern Jiangsu Province is not significant, indicating that the population size has no significant effect on the location entropy of the tertiary industry in the counties of northern Jiangsu Province. The estimated coefficient of industrial structure on the location entropy of the tertiary industry is 0.377, which is significant under the significance level of 1%, indicating that the increase of industrial structure is conducive to the improvement of the location entropy of the tertiary industry.

3.2.4 Market potential

The results in Table 3 show that when control variables are not added, the estimated coefficient of the high-speed rail opening policy on the market potential is 0.239, which is significant at the significance level of 1%, indicating that the high-speed rail opening policy has improved the market potential. However, when the control variables are added, the estimated coefficient of the high-speed rail opening policy on the market potential becomes 0.219, which is significant at the significance level of 5%. It shows that, when other factors remain unchanged, the opening policy of high-speed rail has a significant promoting effect on the market potential compared with the cities without high-speed rail service. From the perspective of control variables, the estimated coefficient of urbanization level on market potential is not significant, indicating that the improvement of urbanization level has no significant impact on market potential. The estimation coefficient of fixed asset investment on the market potential of counties in northern Jiangsu Province is not obvious, indicating that fixed asset investment has no significant impact on the market potential of counties in northern Jiangsu Province. The estimation coefficient of population size on market potential is not significant, indicating that population size has no significant effect on market potential. The estimated coefficient of industrial structure on market potential is -0.623, which is significant at the significance level of 5%, indicating that the increase of industrial structure is not conducive to the improvement of market potential.

3. Robustness test

The sudden outbreak of the novel coronavirus in 2020 has brought a profound impact on China's economy and society, and also had a negative impact on the economic agglomeration of counties. In order to eliminate this influence and further verify the robustness of the results in this paper, the samples in 2020 were removed and the results were re-regression, as shown in Table 4.

Table 4 Robustness test

VARIABLES	-1	-2	-3	-4
	D_E	D_P	R_3	MPI
<i>dtd</i>	0.116	0.005	-0.079**	0.213**
	-0.65	-0.18	(-2.29)	-2.45
<i>wban</i>	-0.013	-0.002	0.002	-0.005
	(-1.29)	(-1.10)	-1.39	(-1.57)
<i>inv</i>	0.818	0.125	-0.249	-0.028
	-1.66	-1.46	(-1.37)	(-0.19)
<i>peo</i>	1.24	0.479	1.404	1.144
	-0.23	-0.58	-0.87	-0.85
<i>pis</i>	2.803**	0.454*	0.470*	-0.366
	-2.2	-2.05	-1.89	(-1.28)
<i>Constant</i>	-10.977	-2.993	-4.875	-4.437
	(-0.42)	(-0.73)	(-0.60)	(-0.68)
County level fixed effect	Y	Y	Y	Y
Time fixed effect	Y	Y	Y	Y
Observations	170	170	170	170
<i>Adj R²</i>	0.228	0.176	0.171	0.631

Note: ***, ** and * respectively indicate that the statistical significance level of the test is 1%, 5% and 10%, and the t value adjusted by robust standard error is in brackets.

The results show that the estimated coefficients of the high-speed rail opening policy on economic density and population density are still not significant, indicating that the high-speed rail opening policy has no impact on economic density and population density. The estimated coefficient of high-speed rail opening policy on the location entropy of the tertiary industry is still significantly negative, indicating that compared with non-high-speed rail opening cities, the high-speed rail opening policy is not conducive to the increase of the location entropy of the tertiary industry. The estimated coefficient of the high-speed railway opening policy on the market potential is still significantly positive, indicating that the high-speed railway opening policy promotes the increase of the market potential compared with the non-high-speed railway opening cities. The results of other control variables are also consistent with the baseline regression results, which indicates that the results analyzed in this paper are quite robust.

4. Research on the impact of high-speed railway on the economic growth of counties in Northern Jiangsu Conclusions and Suggestions

4.1 Conclusion

For the counties in northern Jiangsu, the "siphon effect" and "agglomeration effect" of high-speed rail coexist. The development of high-speed railway can improve regional location factors, promote the exchange of various means of production along the high-speed railway, and thus improve the economic development pattern of some regions^[8]. The construction of high-speed railway reduces the cost of communication and integration between counties, provides convenient conditions for realizing rapid regional transfer, and is conducive to the adjustment of industrial structure and economic growth of the counties in northern Jiangsu. The main conclusions of this study are as follows:

The estimated coefficients of the opening of high-speed rail on the economic density of counties in Northern Jiangsu are not significant, which indicates that the opening of high-speed rail has no significant impact on the economic density of counties in northern Jiangsu compared with the cities without the opening of high-speed rail.

The estimated coefficient of the opening of high-speed rail on the population density of counties in northern Jiangsu is not significant, indicating that the opening of high-speed rail has no significant effect on the population density of counties in northern Jiangsu compared with the cities without high-speed rail service if other factors remain unchanged.

The estimated coefficient of the opening of high-speed rail on the location entropy of the tertiary industry in the counties of northern Jiangsu is -0.091, which is significant at the significance level of 1%, indicating that the opening of high-speed rail reduces the location entropy of the tertiary industry in the counties of northern Jiangsu. However, after the addition of control variables, the

estimated coefficient of the opening of high-speed rail on the location entropy of the tertiary industry is -0.077, which is still significant at the significance level of 5%. It shows that, when other factors remain unchanged, the opening of high-speed rail has a significant inhibitory effect on the location entropy of the tertiary industry compared with the cities without high-speed rail service.

The estimated coefficient of the opening of high-speed rail on the market potential of counties in northern Jiangsu is 0.239, which is significant at the significance level of 1%, indicating that the opening of high-speed rail has improved the market potential of counties in northern Jiangsu. However, after the addition of control variables, the estimated coefficient of the opening of high-speed rail on the market potential is 0.219, which is still significant at the significance level of 5%, indicating that when other factors remain unchanged, Compared with the non-high-speed rail cities, the opening of high-speed rail has a significant promoting effect on the market potential of the counties in northern Jiangsu.

Due to the limitation of the data of counties in northern Jiangsu and the special impact of the outbreak of the epidemic, the main channels of the impact of the opening of high-speed railway on the economic growth of counties in Northern Jiangsu have not yet emerged. However, the result shows that fixed asset investment is unlikely to be the factor that high-speed railway affects the economic growth of counties in northern Jiangsu. However, the high-speed railway may affect the county economy along the route of northern Jiangsu through the tertiary industry, but the growth effect is relatively small.

4.2 Advice

4.2.1 Actively integrate into the regional network and strengthen the nodal effect

Cities and towns at all levels in northern Jiangsu are closely connected through modern transportation network and economic network such as high-speed rail. The networked regional structure will be an inevitable development trend. The networked regional structure plays an important role in promoting the refinement of the division of labor among the towns in northern Jiangsu and the agglomeration effect of the central city, accelerating the mobility of various resource elements and strengthening the connection between nodes at various levels, which is conducive to the spillover effect of the central city. Only by integrating into the networked regional structure can the counties obtain more and broader resources and achieve sustainable development. At the same time, each county in northern Jiangsu should combine its own advantages and characteristics, adjust its functional positioning flexibly according to the external environment and the relationship with the surrounding regions, and become a node in the network area. By various means, the flowing resources in the network can stay in the county, and build itself into a key node in the urban network. Only by giving full play to the positive effect of high-speed rail, can the agglomeration power be improved. So as to achieve positive, high level of coordinated development.

4.2.2 Innovate development paths and strengthen county characteristics

Due to the small size of county economy, counties in northern Jiangsu should start from the overall situation, adjust to local conditions, reposition their own advantageous industries, implement the development strategy of function dislocation, and form a regional cooperation model of coherent industrial chain, complementary functions and shared interests among neighboring counties, so as to overcome the bottlenecks and constraints of their own economic development. We should avoid the concentration of resources and talents to central cities, cope with the "siphon effect" scientifically, and achieve positive and high-level coordinated development. For example, Yunlong Lake Scenic Spot, Huanghuatang Military Headquarters Memorial Hall of the New Fourth Army, Zhou Enlai Memorial Hall and so on can be turned into regional name cards to attract more tourists with the development of high-speed rail. Expand the market of Peixian paper-cut and crayfish from Xuyi with regional characteristics by high-speed rail; Spread the regional cultural heritage such as Huai Opera and Huaiyang cuisine to more people.^[8]

4.2.3 Improving basic support to increase development potential

After the opening and operation of high-speed railway, the accessibility between counties has been improved. The primary factor affecting industrial transfer is no longer the regional location, but the comprehensive environmental advantages of society, economy,

nature and humanity. Only by optimizing the comprehensive factors such as industrial support and government services, can counties maximize the "agglomeration effect" of high-speed rail and avoid or minimize the "siphon effect". First, we should continue to open up to the outside world, optimize the local investment environment, create a favorable environment for infrastructure, public services and financing, and consolidate the sense of belonging and social responsibility of enterprises. Second, we should focus on all-round optimization and integration from rail transit, inter-county express lanes, major infrastructure, communication service centers, node circulation and logistics distribution centers, and then establish a three-dimensional, networked, fast, efficient and all-regional infrastructure network system to realize the sharing of transportation network and information. Through the integration of resources and complementary elements to achieve the overall coordinated development of the region.

4.2.4 Improve coordination and cooperation mechanisms to promote common development among regions

Under the framework of the overall development plan of Northern Jiangsu Province, it should give consideration to the maximization of urban spatial agglomeration benefits and the principle of coordinated and equitable development of urban and rural areas, optimize and reorganize the spatial structure of counties and cities in the region, clarify the spatial timing of regional development and construction, and promote the division of labor, coordination and docking of various regions in the aspects of industrial development, infrastructure, information platform and public services. Carry out unified regional planning and construction, and share information resources. At the same time, a planning implementation evaluation and supervision mechanism composed by the planning management departments of the five cities in northern Jiangsu shall be established to supervise the implementation of traffic planning, ecological environmental protection and information co-construction and sharing in all regions and strengthen coordination with each other, so as to guide the overall construction of urban and rural residents, industrial layout and infrastructure network system in northern Jiangsu.

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