

Research on the Impact of the Construction of Zhengxi High-Speed Railway on the Population Agglomeration of Cities Along the Line

Lili Zhao

Henan Polytechnic University, Jiaozuo, China

ABSTRACT

As an important type of transportation infrastructure in contemporary China, the construction of high-speed rail can effectively promote regional population flow and improve regional connectivity. Taking the Zhengxi high-speed railway as an example, this study uses the dynamic monitoring data of population flow from 2009 to 2013 to construct a dynamic spatial panel model by introducing the method of lagging the urban population size by one period, so as to explore the spatiotemporal effect of the construction of the Zhengxi high-speed railway on the population flow of cities along the line. The results show that the impact of Zhengxi high-speed railway on population agglomeration is reflected in the agglomeration effect and dispersion effect. The impact of Zhengxi high-speed railway on urban population agglomeration along the line is heterogeneous.

KEYWORDS

Zhengxi high-speed railway; Cities along the route; Population agglomerat.

1. INTRODUCTION

Since the reform and opening up, China's railway construction has been an important infrastructure construction and an important support for China's economic development. Since 1978, China has made great achievements in railway construction, with the railway mileage increasing from 5,000 kilometers at that time to 145,000 kilometers in 2020, of which the high-speed railway mileage reached 37,000 kilometers, making it the world's longest high-speed railway network. In 2004, the State Council approved the "Medium and Long-term Railway Network Plan", and the Zhengxi high-speed railway became the first batch of railway projects approved for construction. Zhengxi high-speed railway is a high-speed railway connecting Zhengzhou City, Henan Province and Xi'an City, Shaanxi Province, and is an important part of the "Land Bridge Corridor", one of the main corridors of the "eight vertical and eight horizontal" high-speed railways in the "Medium and Long-term Railway Network Plan" (2016 edition). The construction of railways has not only promoted the development of China's economy, but also improved people's travel conditions and improved the country's comprehensive transportation capacity. As early as the 70s of the 20th century, EU countries carried out research on the impact of intercity railways on regional economy, and analyzed the change characteristics of regional accessibility, industrial development and economic structure change mechanism under the background of high-speed railway, and the impact of high-speed railway on population agglomeration and employment characteristics. It is believed that the construction of high-speed railway has effectively expanded the development space of core cities, strengthened the connection between cities, and is the foundation for the formation of metropolitan areas.

With the rapid development of high-speed railways in China in recent years, there have been more and more studies on the impact of high-speed railway construction on regional development, mainly including the analysis of the characteristic changes of population flow under the influence of high-speed railways [10-12], the impact of high-speed railways on the speed and scope of the flow of production factors such as manpower, capital, and technology [13-15], and the impact of high-speed railways on China's economy [16-18]. Based on this, this study takes the cities along the Zhengxi high-speed railway as the research object, and constructs the population flow index and industrial population association index model based on the macro analysis of urban economic ties, combined with the characteristics of passenger travel and regional industrial development, so as to quantitatively evaluate the micro mechanism of regional population agglomeration and industrial population flow, so as to promote the development of regional economic integration.

2. OVERVIEW OF THE STUDY AREA

The study area is the cities along the Zhengxi high-speed railway, which connects Zhengzhou, the capital of Henan Province, and Xi'an, the capital of Shaanxi Province, and Xi'an, which have become economically important cities in the north, with a total economic output of 700 million yuan and 5.1 billion yuan respectively in 2022. Xi'an has become the driving force of economic growth with rich educational resources and high-tech industries, and in addition to having a large military industry in the country, it also has a relatively complete scientific research system and industrial chain. Zhengzhou implements the strategy of "strengthening the provincial capital", with electronics manufacturing and food processing industry as the leading industries, backed by the market of 100 million people in Henan, and has become another high-profile city in the north. The economies of Zhengzhou and Xi'an have maintained a good growth trend, but the lack of coordination with other neighboring cities, the weak internal linkage, and the unreasonable spatial distribution of capital, talents, raw materials, etc., have hindered the further development of the Xi'an and Zhengzhou metropolitan areas. On September 25, 2005, the construction of Zhengxi high-speed railway started; On February 6, 2010, the Zhengxi high-speed railway was officially put into operation; On January 11, 2011, Xi'an North Railway Station was opened; On September 28, 2012, Zhengzhou East Railway Station was opened, marking the completion and opening of the whole line of Zhengxi high-speed railway, the main cities along the line are Zhengzhou City, Luoyang City, Sanmenxia City, Weinan City, Xi'an City, Xianyang City and other 6 cities, the whole line has a total of 10 stations, including 7 Henan sections and 3 Shaanxi sections: Zhengzhou East Railway Station, Zhengzhou West Railway Station, Gongyi South Railway Station, Luoyang Longmen Station, Mianchi South Railway Station, Sanmenxia South Railway Station, Lingbao West Railway Station, Huashan North Railway Station, Weibei North Railway Station, Xi'an North Railway Station.

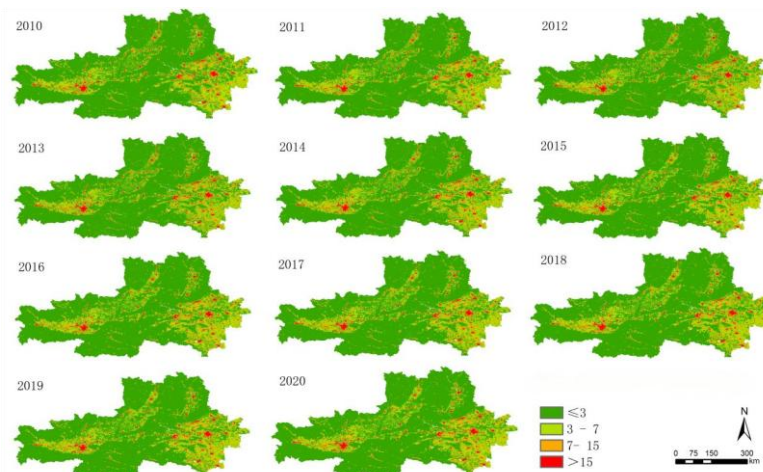


Fig.1: Changes in population density in cities near Zhengxi high-speed railway, 2010-2020

3. MODEL BUILDING AND DATA SOURCES

3.1. Model Selection

According to domestic and foreign literatures, the difference-in-difference method is often used to evaluate the effect of policies, because the difference-in-difference method can effectively control the explanatory variables by using panel data, which avoids the problem of endogeneity to a large extent, and is suitable for the empirical research in this paper. In the framework of double fixed effect estimation, the generalized equation of the standard difference-in-difference method is:

$$Y_{it} = \beta_0 + \beta_1 * treat_i * post_t + \beta * \sum Z_{it} + \mu_i + \tau_t + \varepsilon_{it} \quad (1)$$

Among them, $\sum Z_{it}$ the control variables that denote the change with time and the individual, the effect of β the treatment group on the control group, μ_i the individual fixed effect, τ_t the time fixed effect, and ε_{it} the standard residual term, $i = 1, 2, 3, \dots, N; t = 1, 2, 3, \dots, T$. In this study, i and t represents the city and year, Y the population agglomeration, $treat_i * post_t$ and the impact of opening high-speed rail lines for the city over time, $\sum Z_{it}$ the control variables that change with year and city, μ_i the individual fixed effect, τ_t the time fixed effect, ε_{it} and the standard residual term.

3.2. Variable Selection

In this paper, a standard difference-in-difference model of population agglomeration is established for the opening of high-speed railway, so it is necessary to select the variables that can reflect the level of population agglomeration as the explanatory variables. Refer to the existing research data to determine the population agglomeration degree to reflect the population agglomeration level. The core explanatory variable is a dummy variable $treat_i * post_t$, which reflects the population change caused by the opening of high-speed rail in city i in t -years, and the coefficient of this item can be used to explain the impact of high-speed rail on population agglomeration. According to the relevant research results, this paper believes that the important factors affecting population agglomeration are the changes in economic level, industrial structure, employment level and service facilities caused by factor flow. The estimation results of β_1 are the difference-in-difference estimators that are the focus of this paper, which reflects the impact of high-speed railway on population agglomeration, and if β_1 is significantly greater than (less than) 0, the surface high-speed railway promotes (inhibits) population agglomeration.

Employment Levels: Employment levels reflect the quantity and quality of employment opportunities in the region. In this paper, the employees of the unit and their per capita salary are selected for measurement.

Economic level: The regional GDP and the total retail sales of social consumer goods are used as variables to measure the economic level, reflecting the level of regional economic development.

Industrial structure: The industrial structure reflects the distribution of industries in the region and the main pillars of economic development. There are usually two ways to measure the industrial structure of a region: one is from the perspective of input, which is measured by the value of labor and capital invested by each of the three major industries; The second is the output perspective, which is measured by the added value of the output of each of the three major industries. This paper chooses to measure the industrial structure by measuring the industrial added value from the perspective of output.

Conditions of service facilities: The conditions of regional service facilities mainly consider the investment in social fixed assets, the provision of housing, medical facilities and the level of regional education. The investment in social fixed assets and housing provision represent the urban infrastructure and housing provision, the number of hospitals and health centers represents the

regional medical infrastructure, and the number of students in ordinary middle schools measures the level of secondary education in the city.

Table 1 Variables

	The name of the variable	Variable symbol	Explanation of variables
Explanatory variables	Degree of population agglomeration	Dens	Degree of population agglomeration
Explanatory variables	The opening of high-speed rail in the city	hsr	Whether the city has opened high-speed rail
	Employment level	emp	Number of employees in the city
	Average Salary of Employees (RMB)	Will	The average level of wages in the city
	Business Economics	gdp	Gross Domestic Product (GDP).
control system change measure	Total Retail Sales of Consumer Goods (10,000 yuan)	goods	Reflect urban consumer demand
	Industrial structure	Inds2	Added value of the secondary industry
	Added value of tertiary industry (10,000 yuan)	Inds3	Added value of tertiary industry
	Conditions of service facilities	Inve	Investment in social fixed assets
	Real Estate Development Investment (100 million yuan)	estate	Reflects the availability of housing
	Number of Hospitals and Health Centers	with	The level of urban health care
	Number of students enrolled in regular secondary schools	edu	Urban secondary education level

3.3. Data Sources

In this paper, 20 prefecture-level cities and their 195 districts and counties along the Zhengxi high-speed railway in Zhengluoxi area were studied, and panel data from 2000 to 2020 were selected to conduct an empirical study on the impact of high-speed railway on population agglomeration. The population data are from the China County Statistical Yearbook and the statistical yearbooks of various provinces and cities. The high-speed rail data comes from websites and public data such as the high-speed rail network, the National Railway Administration, and the National Railway Passenger Train Timetable. Control variable data: China Regional Economic Statistical Yearbook and China Statistical Yearbook. A total of 4095 data items are collected in this paper, as shown in Table 2.

Table 2 Descriptive statistics of variables

variable	Number of observations	mean	standard deviation	Minimum	Maximum
High-speed rail opening status	4,095	0.191	0.393	0	1
population density	4,095	388.4	295.7	14.83	1,518
Employees of the unit (person)	4,095	28,966	54,793	3,809	1883000
Average wages of employees	4,095	33,014	27,526	4,010	422,340
Gross Domestic Product (GDP).	4,095	138400006	1860000	6,408	27230000
Total retail sales of consumer goods	4,095	541,629	986,876	2,513	14110000
Proportion of secondary industry	4,095	634,509	804,774	1,605	8448000
Proportion of tertiary industry	4,095	489,565	981,505	1,703	23580000
Investment in fixed assets of the whole society	4,095	1112000	1699000	155	34090000
Real estate development investment	4,095	24.93	85.29	0	1,454
The number of secondary school students in school	4,095	25,852	15,556	1,556	166,089
Number of Hospitals and Health Centers	4,095	1,282	891.3	28	7,365

4. ANALYSIS OF THE IMPACT OF HIGH-SPEED RAIL ON POPULATION AGGLOMERATION

4.1. Difference-in-difference regression results

The regression results of high-speed railway to population agglomeration are shown in Table 3, and the regression coefficient of high-speed railway operation to population agglomeration is 0.294 (significant at the 1% level). It shows that at the 99% confidence level, the null hypothesis is rejected and the coefficient is significantly not 0, and high-speed rail has a significant impact on population agglomeration. The effect coefficient of high-speed railway on population agglomeration is positive, indicating that high-speed railway has a positive impact on population agglomeration. As a transportation infrastructure, high-speed rail provides convenient transportation conditions for population agglomeration.

The average wages of employees and employees in units measure the level of labor force, which has a significant positive impact on population agglomeration. The opening of high-speed railways has led to the flow of labor, information, technology, knowledge and other factors to the local capital, talent and technology, creating more employment opportunities, and the thriving job market has significantly enhanced the attractiveness of the region, resulting in population agglomeration.

The operation of high-speed railway creates conditions for the flow of capital elements in the region, increases the commercial and economic development of the region, and thus enhances the

attractiveness of the population, which in turn directly affects the formation of population agglomeration in the region.

The opening of high-speed railway provides a convenient and fast transportation route for the development of regional industries, and the rapid development of industries promotes the improvement of regional economic level, which can attract and retain talents, and plays a positive role in promoting regional population agglomeration.

The condition coefficient of fixed asset investment, real estate development investment, medical care, education and other service facilities is also positive, indicating that the operation of high-speed railway has strengthened basic equipment such as education and medical care, and other infrastructure has been gradually improved after the inflow of capital factors, creating a better living environment to attract more people.

Table 3 Measurement results of the benchmark model

variable	Model one	Model two	Model three	Model four	Model Five
hsr	0.294*** (0.035)	0.213*** (0.032)	0.099*** (0.031)	0.083*** (0.031)	0.089*** (0.029)
emp		0.878*** (0.019)	0.563*** (0.025)	0.596*** (0.027)	0.155*** (0.032)
Will		-0.153*** (0.015)	-0.369*** (0.018)	-0.376*** (0.019)	0.072*** (0.021)
gdp			0.153*** (0.023)	0.267*** (0.033)	0.172*** (0.031)
goods			0.136*** (0.018)	0.042* (0.022)	-0.306*** (0.026)
Inds2				-0.143*** (0.021)	-0.121*** (0.021)
Inds3				0.125*** (0.024)	0.086*** (0.024)
Inve					0.149*** (0.015)
estate					-0.126*** (0.010)
edu					0.340*** (0.028)
with					0.149*** (0.033)
Constant	5.572*** (0.015)	-1.683*** (0.231)	-0.065 (0.234)	-0.438* (0.255)	-1.666*** (0.346)
N	4,095	4,095	4,095	4,095	4,095
R2	0.017	0.360	0.417	0.427	0.511

Note: *Significant at the 10% significance level, ** at the 5% significance level, and *** at the 1% significance level.

4.2. Heterogeneity test of population agglomeration in different levels of cities

Through the cluster analysis of cities, the trend of population agglomeration at different city levels was further compared. Reading the literature, it is found that most of the previous studies have classified cities according to their size level or urban geographical location, and the classification based on a single dimension is not comprehensive, so this paper will cluster cities based on two dimensions, urban economic level and urban population size.

The data in this paper are derived from the data of China City Statistical Yearbook and China County Statistical Yearbook, and 20 prefecture-level cities along the Zhengxi high-speed railway are selected. In 2020, the permanent population and GDP of 20 prefecture-level cities in Zhengluoxi area were selected for systematic cluster analysis, and the cities were divided into three clusters, and the clustering results are shown in Table 4.

Table 4 Clustering results table

grade	Sample size	city
1	2	Zhengzhou, Xi'an
2	16	Kaifeng, Jiaozuo, Xuchang, Pingdingshan, Sanmenxia, Luohe, Jiyuan, Changzhi, Jincheng, Yuncheng, Linfen, Tongchuan, Weinan, Shangluo, Xianyang, Baoji
3	2	Luoyang, Xinxiang

The estimation of the first level is negative, indicating that the opening of high-speed railway has a negative impact on the population agglomeration of the first level cities. It may be because the population of large cities such as Zhengzhou and Xi'an has been saturated, and the opening of high-speed rail cannot promote the further increase of population density due to government policies and limited resources, which further reflects the problem of "big city disease" in large cities, resulting in a series of problems such as population expansion, traffic congestion, housing difficulties, environmental degradation, resource constraints, and high price levels.

The estimation coefficients of the second-tier cities were all significantly positive at the 1% level, indicating that the opening of high-speed railways had a significant effect on the population agglomeration of the cities of this grade. The proportion of output value of the secondary industry has a significant negative impact on population agglomeration in second-tier cities, indicating that the development of the secondary industry will accelerate the dispersion of population. In addition, in the second-tier urban agglomerations, the increase in the average wage of employees has an inhibitory effect on population agglomeration, which may be due to the fact that the increase in wages has exacerbated the competitiveness of work and the cost of living, resulting in population loss.

The estimation coefficients of the third-tier cities were all significantly negative at the 1% level, indicating that the construction of high-speed railways significantly suppressed the population agglomeration of the third-tier cities. For the third-tier cities with the worst economic development, the opening of high-speed railways has provided a convenient tool for population movement, which has accelerated population loss due to factors such as backward economic level, slow industrial construction, low employment level, and backward infrastructure construction. The estimated coefficients of economic level in the fifth-tier cities were all significantly positive at the 1% level, indicating that the improvement of economic level had a significant positive impact on the improvement of population agglomeration in cities with slow commercial economic development.

Table 5 Results of heterogeneity analysis

variable	First level	Second level	third estate
hsr	-0.032 (0.077)	0.326*** (0.038)	-0.297*** (0.066)
emp	0.545*** (0.093)	0.066* (0.034)	0.510*** (0.086)
Will	-0.320*** (0.064)	-0.313*** (0.030)	-0.809*** (0.093)
gdp	0.337*** (0.068)	0.020 (0.042)	0.802*** (0.183)
goods	-0.001 (0.043)	0.168*** (0.025)	-0.073 (0.066)
Inds2	-0.102** (0.044)	-0.039 (0.026)	-0.497*** (0.107)
Inds3	0.152*** (0.032)	0.118*** (0.033)	-0.102 (0.091)
Inve	0.321*** (0.032)	0.112*** (0.017)	0.508*** (0.052)
estate	-0.187*** (0.021)	-0.164*** (0.014)	-0.012 (0.022)
with	-0.321*** (0.097)	0.142*** (0.036)	0.136 (0.099)
edu	-0.047 (0.088)	0.391*** (0.030)	0.377*** (0.109)
Constant	-3.042*** (0.950)	-1.203*** (0.388)	-5.290*** (1.277)
N	512	2,905	514
R2	0.606	0.549	0.652

5. ROBUSTNESS TEST

5.1. Parallel trend test

An important premise of the difference-in-difference model is that the experimental group and the control group have the same trend before the experiment, so a parallel trend test is required. According to the results of the parallel trend test, it is found that the coefficients are not significant before the implementation of the policy. The coefficient of policy implementation is significant; After the implementation of the policy, the coefficient is also significant. This indicates that the DID model settings satisfy the parallel trend assumptions. As can be seen from the figure, before the opening of high-speed rail, the coefficient of the interaction term is basically around 0, and the coefficient has a negative number. In the year of the opening of the high-speed railway, the high-speed railway had a significant positive impact on population agglomeration, and the coefficient at the time of opening and after the opening was positive, indicating that the coefficient was in line with the basic theoretical assumptions.

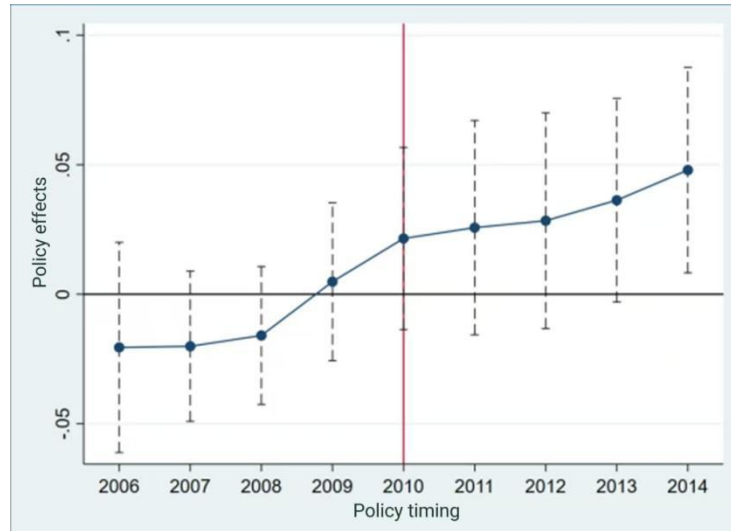


Figure 2 Parallel trend test coefficient plot

5.2. Placebo test

In this paper, the placebo test was used, and the results were randomly sampled 500 times, and the results showed that the placebo test showed a normal distribution around the 0 value (the regression coefficient graph is shown in Figure 3), and the $P > 0.1$ of most of the experimental results (the P value graph is shown in Figure 4), which was not significant, indicating that the original baseline regression was robust through the placebo test. Therefore, it can be proved that the opening of high-speed rail does have an impact on the population density of cities along the route, and the empirical results of this paper are robust.

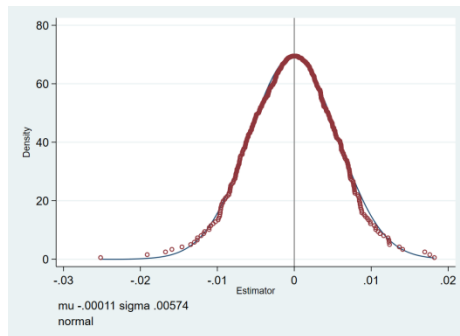


Fig. 3 Regression coefficient graph

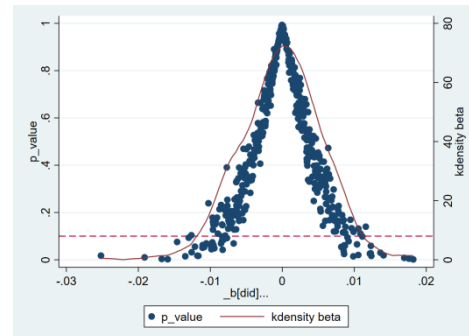


Fig. 4 P-value graph

6. CONCLUSION

High-speed railway plays an important role in the comprehensive transportation network of a country and region, and this paper explores the impact of the construction and operation of Zhengxi high-speed railway on the population agglomeration in the cities along the route. Firstly, this paper reviews the research literature results related to high-speed railway and population agglomeration at home and abroad, and analyzes the impact mechanism of high-speed railway opening on population agglomeration. Secondly, based on the panel data of 19 cities along the Zhengxi high-speed railway from 2004 to 2016, a difference-in-difference model was constructed and heterogeneity test was carried out to analyze the differential impact of the opening of the Zhengxi high-speed railway on the population agglomeration of the surrounding cities along the line. Finally, the parallel trend test and placebo test were used to test the operation and population agglomeration of Zhengxi high-speed railway. The main conclusions are as follows:

(1) The impact of Zhengxi high-speed railway on population agglomeration is reflected in the agglomeration effect and dispersion effect.

From the perspective of aggregation effect, it is mainly divided into two paths: direct impact and indirect impact. As a transportation infrastructure, high-speed rail provides convenient transportation conditions, significantly increases passenger traffic, attracts population flow to areas where high-speed rail is opened, and forms population agglomeration. At the same time, the operation of high-speed railways has enriched the infrastructure in the region, expanded regional functions, improved regional accessibility, improved the level of economy, industry and infrastructure, significantly enhanced the attractiveness of the region, and attracted population agglomeration. The dispersal effect of high-speed railway on the population is reflected in the economic diffusion effect and siphon effect of high-speed railway. The rapid flow of factors narrows the economic gap between cities, and large cities become less attractive to the population; Due to the improvement of regional accessibility in small cities, the population is siphoned by the surrounding large cities, resulting in population loss.

(2) The Zhengxi high-speed railway does not promote the population agglomeration of the first-class and third-level cities, but has a promoting effect on the population agglomeration of the second-level cities.

Dividing 19 prefecture-level cities and above into three levels, the difference-in-difference model is constructed, and it is found that the Zhengxi high-speed railway does not promote the population agglomeration of the first-tier cities, but has a promoting effect on the population agglomeration of the second-tier cities and inhibits the population agglomeration of the third-tier cities. The first-class cities have high population density and high material level, and often have problems such as resource shortage, traffic congestion, and high competitive pressure. The analysis of the population status of the second-tier cities shows that the population agglomeration degree of the cities with high-speed railway is higher than that of the cities without high-speed railway, which verifies that the opening of high-speed railway is the reason for the improvement of urban population agglomeration. After the opening of high-speed railway, the attraction of high-speed railway to the population is further reduced, which accelerates the flow of high-quality resources from the surrounding areas, and the population of the city is dispersed.

REFERENCES

- [1] Gutierrez J, Gonzalez R, Gomez G. The European High-speed Train Network: Predicted Effects on Accessibility Patter[J]. *Journal of Transport Geography*, 1996, (4):227-238.
- [2] Blum U, Haynes K E, Karlsson C. Introduction to the Special Issue: The Regional and Urban Effects of High Speed Trains[J]. *The Annals of Regional Science*, 1997, 31(1):1-20.
- [3] Willigers J, Wee B. High-speed Rail and Office Location Choices: A Stated Choice Experiment for the Netherlands[J]. *Journal of Transport Geography*, 2011, (19):745-754.
- [4] Kiyoshi Kobayashi, Makoto Okmnura. The Growth of City Systems with High-speed Railway Systems[J]. *The Annals of Regional Science*, 1997, 31(1): 39-56.
- [5] Chia-Lin Chen, Peter Hall. The Impacts of High-speed Trains on British Economic Geography: A Study of the UK's Inter City 125/225 and Its Effects[J]. *Journal of Transport Geography*, 2011, (19): 689-704.
- [6] Viekerman R W. High-speed Rail in Europe Experience and Issues for Future Development[J]. *The Annals of Regional Science*, 1997, 31(1): 21-38.
- [7] Kwang Sik Kim. High-speed Rail Developments and Spatial Restructuring[J]. *Cities*, 2000, 17(4): 251-262.
- [8] Haynes K E. Labor Markets and Regional Transportation Improvements: The Case of High-speed Trains[J]. *The Annals of Regional Science*, 1997, 31(1):57-76.
- [9] Feliu J. High-speed Rail in European Medium-sized Cities: Stakeholders and Urban Development[J]. *Journal of Urban Planning and Development*, 2012, 138(4): 293-302.
- [10] Wu Kang, Fang Chuanglin, Zhao Miaoxi, et al. The Intercity Space of Fow Influenced by High-speed Rail: A Case Study for the Rail Transit Passenger Behavior between Beijing and Tianjin[J]. *Acta Geographica Sinica*, 2013, 68(2):159-174.

- [11] Wang Degen. 2014. Influence of Beijing-Shanghai high-speed railway on the spatial and temporal distribution of tourism flow at major stations [J]. *Tourism Journal*(1):75-82.
- [12] Li Xiangmei, Liu Yaya, Cao Liping. 2014. Research on the impact of high-speed railway construction on population flow space[J]. *Chinese Population, Resources and Environment*(6): 140-147.
- [13] Wang Jixian. 2011. Mechanism of high-speed railway influencing urban and regional development[J]. *International Urban Planning*(6): 1-5.
- [14] Wang Jiao'e, Ding Jinxue.2011.Research on the impact of high-speed railway on China's urban spatial structure[J]. *International Urban Planning* (6): 47-52.
- [15] CHEN C L. 2012. Reshaping Chinese space-economy through high-speed trains: opportunities and challenges[J]. *Journal of TransportGeography*, 3: 312-316.
- [16] Zhang Guohua, Zhou Le, Huang Kunpeng, et al.2011.The development trend of urban spatial structure under the construction of high-speed transportation network: from "central node" to "gateway node"[J]. *Urban Planning Journal*(3): 27-32.
- [17] Chen Jianjun, Zheng Guangjian.2014. High-speed railway and urban development from the perspective of agglomeration[J]. *Jianghuai Forum* (2): 37-44.
- [18] Deng Taotao, Wang Dandan, Cheng Shaoyong. 2017. The impact of high-speed railway on the agglomeration of urban service industry[J]. *Journal of Finance and Economics* (7): 119-132.