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Analysis on the Spillover Effect of the Economic Development of Counties and Cities in the Era of High Speed Rail

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Abstract

To study convenient traffic conditions and infrastructure facilities construction how to prompt the coordinated development of regional economy, this article takes the opening of Chengdu-Chongqing high-speed rail as the research object, and uses panel data of 211 counties (districts) in Chengdu-Chongqing region from 2014 to 2018 to empirically test the relationship between the opening of high-speed rail and regional economic development . The results show that the opening of the Chengdu-Chongqing high-speed rail can promote the improvement of regional economic development. The spillover effect of the opening of high- speed rail on regional development is more prominent in small and medium-sized counties and districts. After the opening of high-speed rail, the increase in investment in counties and districts has a certain inhibitory effect on the overall economic development of the region . To this end, this article provides a policy reference for promoting the construction of the dual-city economic circle in the Chengdu-Chongqing region in terms of accelerating regional integration construction planning, coordinating urban and rural development, and accelerating the flow of resources across regions.

Keywords

The Opening of High-speed Rail; Economic Development; Regional Development; Chengdu-Chongqing Area Double-city Economic Circle.

1. Introduction

Since the reform and opening up, China's comprehensive national strength and international influence have continued to increase. The Report of the 19th Party Congress pointed out that China's principal contradiction has been transformed into the contradiction between people's increasing need for a better life with unbalanced and inadequate development status. China's transport infrastructure construction provides an important guarantee to China's rapid economic growth. Compared with air transportation, railway transportation has the advantages of high safety and low cost. Compared with road and water transportation, railway transportation has the characteristics of high speed and high safety. With the development of China's high-speed railway technology, the national high-speed railway network construction has made rapid progress. By the end of 2019, China's railway mileage reached to 139,000 kilometers, exceeding two-thirds of the world's total mileage of high-speed railway. The high-speed transportation network provides great convenience for the public to move across regions, high-speed rail freight has a lower cost than air transportation and overcomes the shortcomings of the long cycle of ordinary railway transportation, thus it has increasingly become the primary choice for inter-regional cargo transportation.

In January 2020, the sixth meeting of the Central Finance and Economics Committee clearly proposed to promote the construction of the Chengdu-Chongqing double-city economic circle and form an important growth pole for high-quality development in the west. Chengdu-Chongqing region, as an important economic center in the western regions, plays an important

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role in stimulating economic development and regional coordinated development. According to the China City Business Charm Ranking List released by the New First-tier Cities Research Institute, from 2016 to 2020, Chengdu ranked 5th in the country for five consecutive years, only lagging behind the four first-tier cities of Beijing, Shanghai , Guangzhou and Shenzhen. Chengdu and Chongqing with city traffic accessibility, industry concentration and commercial diversity, prominent business resources have become the developed cities in western region of China. In 2010, the Chengdu-Guanzhou Express Railway opened, marking the beginning of the rapid railway era in Sichuan. In December 2014, the Southwest 's first high-speed passenger rail lines Chengdu-Mianyang-Leshan intercity railway opened. In 2015, the Chengdu-Chongqing high-speed railway's opening and operation formed a railway transportation corridor linking Chengdu-Chongqing Urban Agglomeration. In the "Government Work Report" of the 13th National People's Congress of Sichuan Province in 2020, it is mentioned that the preparatory work of projects such as the Chengdu-Chongqing Middle Line high-speed rail will be accelerated to create a one- hour commuter circle in Chongqing. With the development of network construction of high-speed railway line Chengdu-Chongqing region, it will help drive along the city infrastructure of the city, so as to promote regional economic development.

This article aims to explore in the largest economic center in southwest China, the high-speed railway between Chengdu and Chongqing area is whether playing a positive role, further study the mechanism of high-speed rail on economic growth. This article remainder is divided as follows: The second part is the literature review, this part sorts out some research related to high-speed railway, while specific to the relationship between the high-speed railway and Economic Development; The third part is Research design, construct the empirical framework of this article, introduce the selected models, constructed indicators and corresponding data sources; the fourth part is the analysis of the empirical results, introduce the benchmark regression and conduct robustness tests; the fifth part is further research aimed to seek the mechanism of the opening of the high-speed rail on the regional economic development. Finally, there are conclusions.

2. Literature Review

Improvement of traffic conditions provides greater impetus to support economic development and urban construction in an area [1], the accessibility of transport promotes the flow of labor, elements and goods among regions [2]. And it can lead to further allocation of factors, which in turn affects the living standards of residents. In recent years, China's high-speed rail construction has been advancing at a high speed, and the layout of the high-speed rail network has provided a more convenient channel for cross-regional flow of elements and regional integration. High-speed rail opening, regional economic development and urban construction have become hot topics of research scholars.

In business activities, logistics costs account for a larger proportion of trade costs, thus traffic conditions will certainly affect the location and production operations of a enterprise. Emergence of high-speed rail freight provides a more convenient channel for cross-regional flow of production factors and commodities, because of traffic conditions improve to bring trade costs down so that the export increase [3], and companies also have an incentive to choose more dispersed suppliers [4]. At the same time, due to the high-speed rail transport can facilitate the movement of persons, on the one hand it will help enterprises researchers gather [5], on the other hand it will help to improve higher education and technical personnel accounting [6], thereby improve the high level of innovation and performance.

The opening of high-speed rail has a certain role in promoting urban and regional development. The construction of high-speed rail infrastructure will help increase local labor employment opportunities and increase regional wages [7]. The industrial transfer caused by the opening of

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high-speed rail will help to optimize the industrial layout and industrial structure [8-9], the close communication among regions especially between big cities and small cities can promote tertiary industry development of cities along high-speed railway, cause secondary industry transition from largest cities to the medium and small cities [10], change the economic spatial layout and promoting regional economic development [11]. At the same time, some scholars believe that the opening of high-speed rail has a positive impact on the urban and regional environment, the opening of high-speed rail can promote the increase of regional industrial green productivity [12], promote technological innovations of the country and thus will help reduce urban pollution emissions [13-14].

However, the increase in inter-regional exchanges brought about by the opening of high-speed rail does not always have a positive impact. On the one hand, the siphon effect caused by high-speed railway has been confirmed [15-16], the elements and resources gathering in the central city, resulting in negative impact on the outskirts of the cities business productivity [17], listed companies invest in other regions, more capital flows to large cities [15], so that these cities' own economic development is hindered, and the wage gap, economic growth gap between cities will be expanded [18]. On the other hand, the opening of high-speed rail shows great differences in the development of regions and cities. The opening of high-speed rail plays a role in the economic growth of larger cities by improving the production efficiency of the service industry and promoting industrial upgrading, while for smaller cities, the effect is manifested in the adjustment of industrial structure [19], relative to small and medium-sized cities at the county level, the impact is even more prominent in the medium and small cities in the prefecture-level [20]. In addition, the price of urban residential land and commercial service land has increased due to the accumulation of resources in regional centers and big cities after the opening of the high-speed rail. If the high-speed rail station is closer to the city center, the impact of high-speed rail construction on land prices will be more obvious [21]. At the same time, the relative decrease in rural income caused by resource agglomeration has also led to a further expansion of the urban-rural gap [22].

Due to the huge differences in geographical conditions and factor endowments in different regions of China, the impact of the opening of high-speed rail on the eastern, central, and western regions also shows great heterogeneity, in the beginning of the opening of high-speed railway, the western region does not show a rapid economic development [23], but scholars believe that the opening of high-speed railway in western region can attract FDI by increasing the flow of factors [24]. China's scholars try to analyze high-speed railway how to affect economic development and environmental quality but it's hard to reach a more consistent conclusion. There is a huge difference between the objective environment area, so the high-speed railway effects on different cities and regions should not be seen as totally same. This paper will study the most developed economic center in western China-Chengdu-Chongqing region, from the perspective of regional development to study whether the opening of the high-speed rail has a direct impact on the economic development of the Chengdu-Chongqing region. The possible marginal contributions of this paper are: First, to verify the existence of positive externalities of the opening of high-speed rail in Southwest China as the research object, thereby helping to enrich the research results of regional economic development; Second, to use the county-level administrative units in the Chengdu-Chongqing region as sample data, the empirical results can provide more microscopic evidence for research on the opening of high-speed rail; thirdly, taking the construction of the Chengdu-Chongqing double-city economic circle as an opportunity, the research on the opening of high-speed rail in this article will provide certain policy enlightenment.

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3. Research Design

3.1. Research Hypotheses and Data Sources

On December 26 of 2015, the opening of Chengdu-Chongqing high-speed rail, marked the high-speed railway network in Sichuan and Chongqing to further mature. By August 2020, many lines have been opened in Sichuan Province, including Chengmianle Line, Chengyu Line, Chengsuiyu, Dacheng Line, Chengguan Line, etc. The opening of Chengdu-Chongqing High-speed Railway makes the Sichuan-Chongqing Express Railway network more complete and the ties between the counties and cities in Chengdu and Chongqing have become closer. The construction of the Chengdu-Chongqing high-speed rail line has enabled Ziyang City, Zizhong County, Neijiang City, Longchang City, Yongchuan District and other cities and counties along the line to formally enter the era of high-speed rail, giving residents of Sichuan and Chongqing new choices for travel and logistics. In order to study the impact of the opening of the Chengdu-Chongqing high-speed rail on the economic development of the counties and cities along the line and the Sichuan-Chongqing region, this paper puts forward the following hypotheses:

Hypothesis 1: High-speed rail connectivity has a positive spillover effect on regional economic development.

Transportation infrastructure improvements will help promote regional economic development [1], as the high-speed railway opening and operation of the site and the links between cities and counties will be more closely. High-speed railway will not only have a direct impact on urban and regional sites along the line, the strengthened links among regions caused by the opening of high-speed railway are helpful for cross-flow of talent, resources and elements and thus it has a positive impact on regional economic development.

Hypothesis 2: The economic spillover caused by the opening of the high-speed rail mainly affects the small and medium-sized cities in the region.

Mobility of factors have combined effect that will lead to resources and elements of the smaller cities transferred to metropolitan area, thus providing favorable conditions for economic development in the center of the city. Developed cities and regions often have more complex economic structure and are earlier to have the first high-speed railway, while many medium and small cities often gain traffic infrastructure dividends only when the railway line close to them begins to operate. For this reason, we believe that the spillover effect of the opening of high-speed rail on the economy will mainly have a greater impact on small and medium-sized cities.

Hypothesis 3: After the opening of the high-speed rail, changes in fixed asset investment and real estate development investment will affect economic spillovers.

In the theory of economic growth, investment, consumption and exports are regarded as the "three carriages" that drive economic growth. Chengdu and Chongqing are located in the southwest of China, compared with consumption and exports, we believe that the opening of high-speed rail in the region will mainly affect the level of investment between regions. Especially for the city along high-speed rail, the effects brought by high-speed railway can be shown by testing whether investing in fixed assets and real estate development investment have played a good role in boosting economic growth.

In order to test the above hypothesis, this paper constructs a panel data of 221 counties (districts) in Chengyu region from 2014 to 2018. Due to the availability of data and in order to maintain the consistency of the statistical caliber, this article discards the data before 2014. Main data is derived from the "Statistical Yearbook of Sichuan Province" and "Chongqing Statistical Yearbook", the national high-speed railway data comes from National Railway Bureau, the Chengdu Railway Bureau official website site, through manual sorting and

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matching some news report obtained. In order to avoid extreme value, the data was observed after the value of 1% of the tail withdrawal process.

3.2. Variable Selection and Model Setting

In order to investigate the influence of high-speed railway for the regional economy, the explained variable is the level of economic development, measured with the total value of production (grp). The explanatory variables are binary dummy variables, in order to simultaneously examine high-speed railway impact on inter along regional and economic development, we introduce whether the county (district) is located at Chengdu-Chongqing high-speed railway line (Di), whether Chengdu-Chongqing high-speed railway has opened (Dt) and whether there is a high-speed rail station (cohighwayi). Here, the control variables of this paper include the industrial structure, urbanization, industrial development level and the level of financial development, specifically with the secondary industries accounted proportion of GDP (instructure2), the proportion of the urban population of total population (urbanprop), the total industrial output value of enterprises above designated size (inoutput) and the local general public budget expenditure (govexp). The descriptive statistics of the main indicators are shown in Table 1, in which some variables are logarithmized and marked with the prefix" ln".

Table 1. Descriptive statistics

variable	number	P25	mean	P75	min	max	sd
lngrp	826	13.94	14.04	14.96	4.677	16.23	2.174
lnpgrp	826	10.14	10.28	10.85	4.672	11.72	1.301
instructure2	826	0.423	0.516	0.583	0.111	1.05	0.159
Di	826	0	0.087	0	0	1	0.282
Dt	826	0	0.602	1	0	1	0.490
cohighwayi	826	0	0.215	0	0	1	0.411
urbanprop	826	37.50	50.11	57.30	21.99	100	17.98
lngrinvest	826	13.99	14.44	14.94	11.64	15.95	0.760
lnreinvest	826	11.49	12.04	13.15	0	15.03	2.101
lninoutput	826	13.76	14.45	15.25	8.450	16.71	1.136
lngovrev	826	10.91	11.53	12.17	8.479	13.61	0.987
lngovexp	826	12.35	12.77	13.18	11.33	14	0.578

Further, construct the following measurement model:

$$Economyi,t = \beta 0 + \beta 1 Di,t + \beta 2 Controli,t + \lambda i + \gamma t + \varepsilon i,t \quad (1)$$

Among them, the subscripts i and t represent city and time respectively, Economyit is the level of economic development, measured by lngrp, Dit is a dummy variable indicating whether the county i is connected to the Chengdu-Chongqing high-speed rail in year t, Controlit is the control variable involved in this article, β0 is a constant term, λi is the county fixed effect, and γt is time fixed effect, εit is the error term.

4. Empirical Results

4.1. Benchmark Regression

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Table 2. Benchmark regression results

	(1)	(2)	(3)	(4)	(5)
	lngrp	lngrp	lngrp	lngrp	lngrp
Di	0.3306				
$cohighway_i$	(0.8223)	-0.0833			
Dt		(-0.2358)	0.3413***	-0.6142***	1.1437**
			(2.6778)	(-5.1178)	(2.2348)
L.instructure2				1.5203***	6.5435***
				(3.3830)	(7.8858)
L.urbanprop				0.0103	-0.2477**
				(1.5834)	(-2.0019)
L.lngovexp				-0.5307***	-0.9410
				(-2.6033)	(-1.4059)
L.lninoutput				0.1383	-0.9943**
				(1.1617)	(-2.0156)
Constant	14.3413***	14.3768***	14.3712***	17.8741***	49.1292***
	(154.9262)	(166.8066)	(173.4475)	(6.0007)	(4.3774)
Year	YES	YES	YES	YES	YES
County	YES	YES	YES	YES	YES
N	826	826	826	599	599
F	11.9727	11.9401	14.9537	9.1408	13.2095
Adjusted R^2	0.1639	0.1639	0.1652	0.0389	0.2520

Note: The values in parentheses are t- values; * , ** , *** indicate significant at the statistical levels of 10% , 5%, and 1%, respectively.

Based on the county panel data of 2014-2018, double difference method (DID) was used, considering the potential endogenous problems, we have done a lag phase of all the control variables. We respectively estimated the economic impact of the Chengdu-Chongqing high-speed rail on the counties along the line and the connected regions, the results are shown in Table 2. Column (1) shows the economic impact of the opening of the railway on the counties and districts along the Chengdu-Chongqing high-speed rail line, the coefficient is positive but not significant, indicating that the opening of the high-speed rail does not have a direct positive impact on the economic growth of the counties and districts along the line with stations. Column (2) examined the county with over one high-speed rail station in which whether the economy has grown after high-speed railway, the coefficient is negative and not significant, indicating that high-speed rail station dosen't play a good role in promoting the local economy, the mechanism remains to be explored. Column (3) to (5) list the herein benchmark regression results, shows the the economic spillover effects of Chengdu-Chongqing high-speed railway. Considering the differences between the counties, we introduce control variables and control the individual effects of counties and year fixed effects. The coefficient is positive and significant at 5% level, indicating a positive impact of the Chengdu-Chongqing high-speed railway on the regional economy, hypothesis one is verified. The secondary industry has a significant positive impact on economic growth, while the level of urbanization has shown a negative relationship with economic growth, and the reason can be that compared to Chengdu, Chongqing City and

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other more developed city of China, most of the counties and districts in the southwestern region are facing population outflow. As talents, elements, and resources flow to other cities, the economic growth of these districts mainly depends on industrial investment and the excavation of local tourism resources, while the level of urbanization has an limited impact. In addition, the role of government fiscal expenditures in promoting the economy is not obvious.

4.2. Robustness Test

In order to ensure the reliability of the conclusions, this article conducts robustness tests from two aspects. First, we select two alternative variables, per capita gross production (pgrp) and local general public budget income (govrev), to measure the level of economic development. As shown in Table 3, the county and year effects are also controlled, and the model settings are consistent with the baseline regression. After the replacement of the explanatory variables, the core coefficient is positive and significant and thus our conclusion is proved reliable.

Table 3. Robustness test: alternative explained variables

	(1)	(2)	(3)
	lngrp	lnpgrp	lngovrev
Dt	1.1437**	0.7610**	0.2951***
	(2.2348)	(2.5081)	(6.4198)
L.instructure2	6.5435***	3.8947***	-0.2749***
	(7.8858)	(8.0044)	(-4.3204)
L.urbanprop	-0.2477**	-0.1445*	-0.0096
	(-2.0019)	(-1.9653)	(-1.1172)
L.lngovexp	-0.9410	-0.5553	-0.0372
	(-1.4059)	(-1.4297)	(-0.5867)
L.lninoutput	-0.9943**	-0.5591*	0.0255
	(-2.0156)	(-1.9635)	(0.7551)
Constant	49.1292***	30.4199***	12.1884***
	(4.3774)	(4.6360)	(12.5862)
Year	YES	YES	YES
County	YES	YES	YES
N	599	599	599
F	13.2095	13.9177	32.2548
Adjusted R^2	0.2520	0.2870	0.9764

Note: The values in parentheses are t- values; * , ** , *** indicate significant at the statistical levels of 10% , 5%, and 1%, respectively.

Considering that Chengdu belongs to capital cities and Chongqing is one of the municipalities directly under the Central Government respectively. Compared with other cities and counties, their economic strength is stronger, and the construction of high-speed rail lines and other transportation facilities is more mature, and the policy dividends they have are far beyond those of other regions. Therefore, by deleting the samples of Chengdu and Chongqing, we can not only test whether the empirical results are robust, but also further study whether the opening of high-speed rail has the same economic spillovers for less developed counties. Here , the Sichuan Basin unique geological formations determines the construction and distribution of high-wire network, thanks to the relatively flat terrain Chengdu Plain in eastern Sichuan to

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form a dense network of urban agglomerations, Chongqing City area is mountainous terrain, but with the unique political and economic status, it also has developed and convenient transportation conditions. However, Liangshan Prefecture, Ganzi Prefecture, and Aba Prefecture in Sichuan are mostly ethnic minority areas, with rugged terrain and inconvenient transportation. High-speed rail construction is facing greater difficulties and costs. Therefore, by deleting the sample data of the three major autonomous prefectures in Sichuan, the bias caused by the geographical gap can be better avoided. For this reason, this paper reduces the sample size, and the regression results are shown in Table 4. The column (1), (3) and (5) respectively deleted Chengdu and Chongqing, the three autonomous prefectures and all of them, in columns (2), (4) and (6) the explanatory variables will be replaced with per capita GDP as a robustness test, and the sample size is the same as above. Due to space constraints, this section does not report the impact of the opening of high-speed railways on local general public income in a small sample, the test coefficient is also significant. After reducing the sample, the results are still significant, and the spillover effect of high-speed rail on regional economic development still exists. It can be seen after deleting Chengdu and Chongqing, the coefficient is positive and significant at 1% level, while the adjusted R2 has been significantly improved, indicating that high-speed railway indeed help to promote economy development of these counties and we have verified Hypothesis 2.

Table 4. Robustness test: small sample test

	(1)	(2)	(3)	(4)	(5)	(6)
	lngrp	lnpgrp	lngrp	lnpgrp	lngrp	lnpgrp
Dt	0.2521***	0.2391***	1.1150**	0.7444**	0.2506***	0.2387***
	(16.1399)	(13.6609)	(2.1791)	(2.4543)	(15.9637)	(13.7572)
L.instructure2	0.2258**	0.3795***	6.5095***	3.8738***	0.2166**	0.3695***
	(2.3049)	(2.8907)	(7.9013)	(8.0185)	(2.1928)	(2.7833)
L.urbanprop	0.0012	0.0054	-0.2423*	-0.1413*	0.0013	0.0053
	(0.4699)	(1.4171)	(-1.9658)	(-1.9301)	(0.4879)	(1.3982)
L.lngovexp	-0.0133	-0.0053	-0.8782	-0.5170	-0.0080	-0.0004
	(-1.1568)	(-0.4849)	(-1.2952)	(-1.3146)	(-0.7811)	(-0.0425)
L.lninoutput	0.0444***	0.0395***	-1.0224**	-0.5765**	0.0426***	0.0370***
	(4.1127)	(3.2122)	(-2.0588)	(-2.0110)	(3.9331)	(3.0564)
Constant	13.5696***	9.4075***	48.5155***	30.0469***	13.5385***	9.3838***
	(62.8366)	(34.6650)	(4.3078)	(4.5643)	(64.1832)	(35.0795)
Year	YES	YES	YES	YES	YES	YES
County	YES	YES	YES	YES	YES	YES
N	411	411	588	588	400	400
F	329.9425	301.6797	13.3437	14.0511	335.1091	314.8066
Adjusted R^2	0.9903	0.9916	0.2554	0.2902	0.9897	0.9917

Note: The values in parentheses are t- values; * , ** , *** indicate significant at the statistical levels of 10% , 5%, and 1%, respectively.

4.3. Parallel Trend Test

Chongqing North Railway Station and Chengdu East Railway Station were put into operation in 2006 and 2011 respectively. After 2010, many intercity railways and express railways in Sichuan Province were put into operation. To understand whether there is a marked increase in economy development after the high-speed railway, a time trend chart is drawn in Figure 1.

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Since the Chengdu-Chongqing high-speed rail was operated in the end of 2015, so we chose 2016 as the base year. It can be seen from the figure that before the opening of the high-speed rail, there is no obvious trend in regional GDP and per capita GDP. In the first two years after the opening of the high-speed rail, economic growth showed a downward trend. In the second year after the opening of the high-speed rail, the regional GDP and per capita GDP began to rise again. Due to the huge investment in the early stage of the high-speed rail construction, and people need a period of time to adjust their travel plan and infrastructure construction also require some time, thus in the long term, high-speed railway exhibit a positive role in promoting regional economic development, consistent with the basic conclusions of this paper.

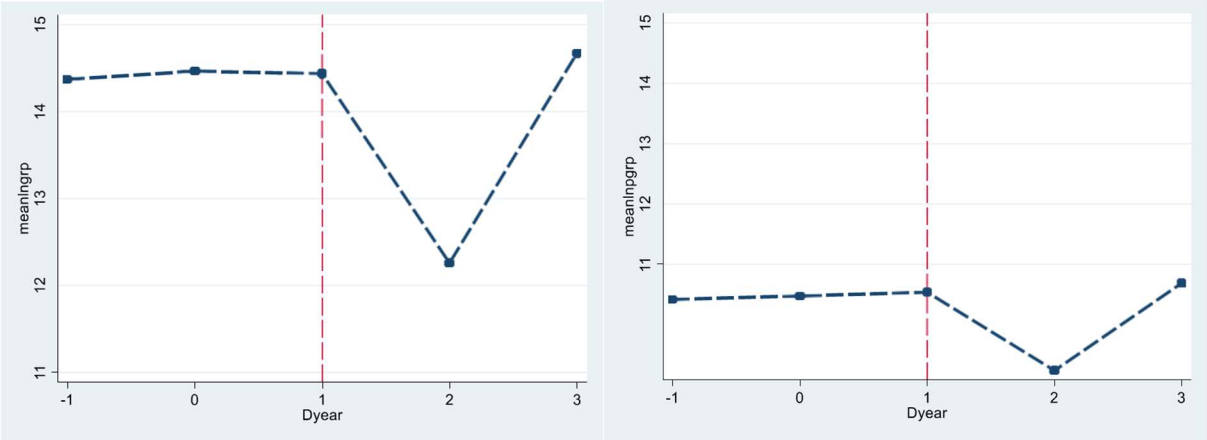

Figure 1. The impact of the opening of high-speed rail on regional economic development

5. Further Analysis

Convenient traffic conditions can reduce the cost of the trans-regional flow of resources and elements, high-speed railway can bring logistics costs and information costs to decrease, companies therefore choose remoter suppliers, in order to improve business performance [4]. From the perspective of economic development, compared to the more developed regional centers and prefecture-level cities, county economic development mainly depends on corporate investment to set up factories in the local industry and develop local rural tourism. We have verified that the opening of high-speed rail does contribute to the economic development of counties and districts, but the mechanism still needs to be tested. From the perspective of attracting investment, we choose two indicators, namely, the amount of investment in fixed assets in counties and districts and the amount of investment in real estate development to test whether the mediation effect exists. Specifically, we introduce the interaction terms of fixed asset investment and the opening of high-speed rail (grinDt), the interaction term of real estate development investment and the opening of high-speed rail (reinDt), and other settings are consistent with the benchmark regression, the results are shown in Table 5. We can see that both the investment in fixed asset and the investment in real estate development have a positive relationship with economic growth, and thus it verifies the view of that county economic development mainly relies on investment. After the opening of the high-speed rail, the increase in fixed asset investment or real estate development investment has no significant impact on local government revenue, which is determined by the government revenue structure. The interaction term coefficients of high-speed railway and investment in fixed assets and in real estate development can significantly verify the hypothesis three. After the opening of high-speed railway, county investment in fixed assets and real estate development will increase suppression of regional economic development. One possible reason for this is that the increased investment brought by the high-speed railway is largely confined

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to the counties along the high-speed rail station but no significant radiation effects on the counties near the line, that is to say, after the opening of high-speed rail, economic spillovers caused by investment in fixed assets and real estate development are very limited.

Table 5. The mechanism tests

	(1)	(2)	(3)	(4)	(5)	(6)
	lngrp	lnpgrp	lngovrev	lngrp	lnpgrp	lngovrev
grinDt	-1.4902***	-0.8715***	-0.0296			
	(-5.1062)	(-5.1325)	(-1.3783)			
lngrinvest	4.6245***	2.7222***	0.3785***			
	(3.8157)	(3.8419)	(6.0960)			
reinDt				-0.6745***	-0.3993***	-0.0133
				(-4.4056)	(-4.4355)	(-1.3211)
lnreinvest				0.5862***	0.3467***	0.0461**
				(2.8615)	(2.8912)	(2.0874)
Dt	21.9032***	12.8968***	0.6375**	9.5954***	5.7646***	0.4497***
	(5.0916)	(5.1477)	(1.9996)	(4.7698)	(4.8762)	(3.4919)
L.instructure2	7.6496***	4.5446***	-0.2034***	7.0161***	4.1743***	-0.2479***
	(8.1594)	(8.3013)	(-3.2131)	(8.0222)	(8.1554)	(-3.8924)
L.urbanprop	-0.2885**	-0.1683**	-0.0099	-0.3258***	-0.1907***	-0.0105
	(-2.3934)	(-2.3575)	(-1.1977)	(-2.6642)	(-2.6343)	(-1.2205)
L.lngovexp	-1.2159	-0.7195*	-0.0969	-0.6910	-0.4073	-0.0326
	(-1.6411)	(-1.6681)	(-1.5168)	(-1.0288)	(-1.0454)	(-0.5082)
L.lninoutput	-1.2182**	-0.6914**	-0.0002	-0.9799*	-0.5506*	0.0213
	(-2.3472)	(-2.2997)	(-0.0056)	(-1.9626)	(-1.9101)	(0.6396)
Constant	-9.3276	-3.9626	7.8489***	42.1057***	26.2656***	11.6609***
	(-0.5471)	(-0.3958)	(6.8968)	(3.7800)	(4.0356)	(11.6682)
Year	YES	YES	YES	YES	YES	YES
County	YES	YES	YES	YES	YES	YES
N	599	599	599	599	599	599
F	11.9991	12.5458	35.2512	11.1526	11.7881	31.0477
Adjusted R2	0.3219	0.3538	0.9785	0.2846	0.3188	0.9767

Note: The values in parentheses are t- values; * , ** , *** indicate significant at the statistical levels of 10% , 5%, and 1%, respectively.

6. Conclusion

Based on the empirical results of this article, we find that the opening of high-speed rail, especially the opening and operation of the Chengdu-Chongqing high-speed rail line, can promote regional economic growth, and the economic spillover effect in the era of high-speed rail has been confirmed. High-speed railway can significantly promote economic growth of the relatively underdeveloped counties and regions. In addition, local investment in fixed assets and real estate development has a negative impact on the overall development of the region. After the opening of the high- speed rail, the ways in which the strengthening of regional ties will lead to the overall development of the regional economy remains to be explored. At the

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same time, due to the traffic link is not limited to Sichuan and Chongqing, in fact, Chengdu-Chongqing high-speed railway promotes the links among Yunan province, Guizhou province, Sichuan province and even Hubei Province. Whether the opening of Chengdu-Chongqing high-speed railway can promote the overall economy growth in the southwest of China is a topic worthy of further study.

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