

The Impact of the Belt and Road Initiative on the Economic Development of Node Cities

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Abstract

In the face of the dual difficulties of economic globalization, unbalanced regional economic development and low resource allocation efficiency, the Belt and Road as an important platform for building a new development pattern in China and promoting international economic cooperation is playing an irreplaceable role. It is of great practical significance to accurately assess the impact of the Belt and Road initiative on the economic growth of domestic node cities. Taking the Vision and Actions for Jointly Building the Silk Road Economic Belt and the 21st Century Maritime Silk Road published in 2015 as a quasi-natural experiment, this paper constructs a two-way fixed-effect model and empirically tests the impact of the Belt and Road Initiative on the economic growth of node cities along the route and its mechanism by using a sample of 274 prefecture-level cities in China from 2009 to 2019. The results show that the “Belt and Road” initiative has a significant promoting effect on the economic growth of node cities along the route, which is still robust under the test of placebo test and PSM-DID model. And promoting the rationalization and upgrading of the industrial structure of node cities along the route is an important mechanism. Heterogeneity test shows that the promotion effect is more significant in less developed cities and inland cities.

Keywords

The Belt and Road Initiative, Economic Growth, Upgrading of Industrial Structure, Fixed Effect Model

1. Introduction

On the one hand, in recent years, global economic growth has slowed down, geopolitical conflicts have occurred frequently, anti-globalization trends have risen, a new round of technological revolution is in full swing, and the global

development pattern is facing great changes. On the other hand, when China achieves economic growth, the gap of regional development level remains high for a long time. Taking the data released by China's National Bureau of Statistics in 2022 as an example, the GDP per capita of the 10 eastern provinces is 1.60 times that of the six central provinces, 1.77 times that of the 12 western provinces, and 2.03 times that of the three northeastern provinces. Based on a scientific judgment of the situation at home and abroad, in order to strengthen international cooperation, promote shared responsibility and win-win interests, deepen domestic reform and development in various fields, and push China's vast inland regions and border regions to the forefront of opening up, the President Xi Jinping put forward the initiative of jointly building the Silk Road Economic Belt and the 21st Century Maritime Silk Road when visited Central Asia and Southeast Asia in September and October 2013. And on March 28, 2015, the National Development and Reform Commission, the Ministry of Foreign Affairs and the Ministry of Commerce jointly issued the Vision and Action on Jointly Building the Silk Road Economic Belt and the 21st Century Maritime Silk Road (hereinafter referred to as the Vision and Action), which made clear plans for the key provinces and cities of the Belt and Road Initiative.

By June 2023, China had signed more than 200 cooperation documents on Belt and Road cooperation with 152 countries and 32 international organizations, and made a series of achievements in railway and shipping infrastructure construction, import and export quarantine and customs cooperation, industrial chain cooperation, multilateral investment and financing cooperation, cultural exchanges, and entry-exit tourism cooperation. The total trade volume between China and countries along the Belt and Road increased from 1.63 trillion dollars in 2013 to 2.9 trillion dollars in 2022, and the cumulative trade volume exceeded 19.1 trillion dollars. From 2013 to 2022, China's direct investment in countries along the Belt and Road exceeded 240 billion US dollars, and those countries' direct investment in China exceeded 140 billion US dollars. Therefore, it is of great significance to empirically evaluate the impact and mechanism of the Belt and Road Initiative on the economic development of key provinces and cities along the route.

Existing studies on the economic effects of the Belt and Road initiative are mainly theoretical studies, while empirical studies mostly focus on national level such as location choice, trade potential, and scientific and technological innovation, while there are few relevant studies on the empirical test of its impact on domestic node cities along the route and its mechanism. Moreover, compared with China's traditional major trading partners, many countries along the Belt and Road have a lower level of development, a lower level of openness, and backward service and manufacturing industries. What impact will the development of economic and trade relations between China and countries along the Belt and Road have on China's regional economic growth is an important issue related to the correct handling of the relationship between openness and coor-

dination in our country. It is of theoretical value and policy significance to study the influence of the Belt and Road Initiative on China's regional economic growth. Therefore, this paper takes the release of the Vision and Action of the Belt and Road as a quasi-natural experiment, takes the data of 274 prefecture-level cities from 2009 to 2019 as samples, and uses the difference-difference model and fixed-effect model to test the impact of the Belt and Road initiative on the economic development of node cities and its main mechanism. The results demonstrate a significant promoting effect of the Belt and Road initiative on the economic growth of node cities along the line, and promoting the rationalization and upgrading of the industrial structure of node cities is an important mechanism. Heterogeneity test shows that the promoting effect is more pronounced in less developed cities and inland cities.

Compared with the existing literature, the possible marginal contribution of this paper is mainly reflected in the following aspects:

First of all, existing studies mainly discuss the impact of the Belt and Road Initiative on country's economic growth and trade competitiveness. This paper shifts the perspective from external to internal, and uses prefecture-level city data to focus on city economic growth, which is a useful supplement to related fields.

Secondly, in the research design, the robustness test was carried out using PSM-DID (propensity score matching difference-difference model) model, which overcame the systemic bias and endogeneity problems of the model to a certain extent, and effectively identified the causality.

Finally, this study explores the mediation effect of industrial structure upgrading and the heterogeneity of regional and economic development level, which enriched the evaluation conclusions of the policy effect of the Belt and Road initiative.

The remainder of this paper is organized as follows. Section 2 contains a review of the related literature. Section 3 displays empirical model setting and data description. Following that is empirical result analysis and further discussion on the mechanism. The last section concludes this paper.

2. Literature Review and Research Hypothesis

2.1. The Economic Benefits of the Belt and Road Initiative

In general, the Belt and Road is a new channel and network of economic and trade between China and neighboring countries in Central Asia, Eastern Europe and Southeast Asia, which is of great significance for the economic opening up of China's inland regions, the transformation and upgrading of the industrial structure in the eastern region (Dong & Lin, 2015). After the implementation of the Belt and Road Initiative, the role of gateways in central and western China in foreign trade has gradually increased (Li & Jiang, 2020).

In terms of trade and investment, with the continuous development of the Belt and Road construction, the density of trade and investment networks

among countries along the route is increasing. The Belt and Road Initiative has significantly promoted the growth of China's trade with countries along the route (Sun et al., 2017), but trade complementarity is still greater than competition, which is an important condition for the gradual increase of China's exports to countries along the route (Li et al., 2017). Moreover, the hard-working and brave entrepreneurship of China's foreign economic and trade practitioners, as well as the foreign policy of "peaceful coexistence and non-interference in each other's internal affairs" that China has always adhered to, also become new comparative advantages in bilateral trade with countries along the Belt and Road (Li & Yan, 2018), which further promotes trade between China and countries along the Belt and Road. The Belt and Road Initiative has also promoted China's direct investment in the countries along the route. After the implementation of the Belt and Road Initiative, the number of investment projects of Chinese enterprises in the countries along the Road has increased by 15.9% - 31.3% (Lv et al., 2019).

In terms of industrial structure, China's direct investment in countries along the Belt and Road can separate industries or production links that have lost their comparative advantages, thereby improving China's position in the global value chain (Peng & Li, 2018). With the global flow of production factors and the gradual evolution of the international trade pattern, the trade of intermediate products has become the main form for countries to participate in the international division of labor. China can comply with the law of comparative advantage and transfer some excess industries and overcapacity to countries with lower economic development level to adjust its own industrial structure (Huang & Yu, 2017). And countries along the Belt and Road have the conditions to undertake China's industrial transfer, and can upgrade their domestic industrial structure with the help of international industrial transfer (Zhang et al., 2016). By studying the international division of labor, industrial correlation and complementarity between China and countries along the Belt and Road, it can also be found that China has the ability to dominate the regional value chain of the Belt and Road (Wang & Wu, 2018). Participation in the construction of the Belt and Road can upgrade the value chain status and the efficiency of the international division of labor of China and countries along the Road.

2.2. The Factors of Regional Economic Growth

There are many factors affecting economic growth. Existing literatures have discussed the factors affecting regional economic growth from the aspects of labor, capital, technology and other production factors levels, industrial upgrading, value chain division and other industrial levels, government competition, tax policies, marketization degree and other institutional levels.

In terms of production factors, Cai et al. (2001) believe that the lag of labor market development leads to the distortion in resource allocation, and the flow of population plays a decisive role in expanding or delaying the regional eco-

conomic growth gap (Duan & Liu, 2005). Through the analysis of FDI panel data, Wan (2006) believes that regional differences in domestic investment are the main cause of regional economic differences, and foreign direct investment is also one of the important reasons for aggravating China's dual economic structure. In the process of social and economic development, the connotation of production factors has been enriched, science, technology, management and information have entered the production process and playing an increasingly important role in regional economic growth (Wu et al., 2011).

At the industrial level, the upgrading of industrial structure is essentially the importance of various industries changes according to an evolution law (Rostow, 1959), which was initially dominated by agriculture, then replaced by manufacturing industry, and finally replaced by the tertiary industry. This upgrading process is also a process of optimizing the allocation of production factors, which gradually flows from low-efficiency industries to high-efficiency industries, thereby improving social productivity and driving economic growth (Peneder, 2003). China is going through this process. At present, China's tertiary industry is developing rapidly, providing continuous momentum for economic development, especially the producer service industry is becoming a new driving force for economic development (Li et al., 2017).

In addition, the degree of regional openness to the outside world (Zhao, 2001) and regional protection policies (Young, 2000) are also important factors affecting regional economic growth. For example, the Chinese government's special incentives in foreign exchange retention, fiscal handover, taxation, financial credit and investment project approval have greatly promoted the rapid economic development of the eastern coastal areas (Deng, 2005).

2.3. Research Hypothesis

The Belt and Road initiative can promote the transfer of excess and backward production capacity to countries along the route, promote technological exchanges and cooperation between China and countries along the route, promote the cooperation between China and countries along the route in the tertiary industry such as cultural tourism, and then upgrade China's industrial structure, and the upgrading of industrial structure can affect economic growth through factors allocation, technological progress and other mechanisms. Based on the above analysis, this paper proposes the following research hypotheses.

H1: The Belt and Road Initiative can promote the economic growth of node cities along the route, and an important mechanism is to promote the upgrading of the industrial structure of node cities along the route.

Under the law of diminishing marginal effect, the initiative may have a heterogeneous effect on cities with different economic bases. Before the initiative was put forward, developed areas are earlier than less developed areas in the upgrading of industrial structure. Therefore, it can be inferred that the initiative has a greater role in promoting the economic growth of less developed cities and

a smaller role in promoting the economic growth of developed cities (Wang & Tian, 2021). At present, the developed cities are mostly located in the coastal areas, while the less developed cities are concentrated in the inland areas.

H2: According to the law of diminishing marginal effect, compared with coastal and developed cities, the Belt and Road Initiative has a more pronounced role in promoting the economic growth of inland and less developed cities.

3. Model and Data

3.1. Empirical Model

With reference to most of the existing researches on the economic effects of the Belt and Road initiative, this paper takes the Belt and Road Initiative as a quasi-natural experiment and adopts the Difference-in-Difference (DID) model to examine the effect of the Belt and Road Initiative on the economic development of node cities. On March 28, 2015, the National Development and Reform Commission, the Ministry of Foreign Affairs and the Ministry of Commerce jointly issued the Vision and Actions to Promote the Joint Construction of the Silk Road Economic Belt and the 21st Century Maritime Silk Road, which mentioned a total of 26 important node cities along the Belt and Road: Xi'an, Xining, Shanghai, Tianjin, Ningbo, Lanzhou, Zhoushan, Guangzhou, Shenzhen, Hefei, Nanchang, Changsha, Wuhan, Zhengzhou, Chongqing, Chengdu, Sanya, Zhanjiang, Shantou, Qingdao, Yantai, Dalian, Haikou, Fuzhou, Xiamen, Quanzhou. In view of the serious lack of data during the sample period of Nanchang City, it is not discussed in the analysis. Referring to the study of Liu (2022), in this study, the above 25 node cities were used as the treatment group, and the other cities were used as the control group. The baseline regression model is as follows:

$$\text{Lngdp}_{it} = \beta_0 + \beta_1 \text{Treat}_i \times \text{Post}_t + \gamma X_{it} + \theta_i + \mu_t + \varepsilon_{it} \quad (1)$$

where the subscript t and i represent the sample cities and time periods respectively, the explained variable Lngdp is the economic development level of the prefecture-level city, the specific index is the logarithm of the total GDP of the prefecture-level city, and the interaction term $\text{Treat} \times \text{Post}$ is the net policy effect of the Belt and Road initiative. The estimator of the coefficient β_1 reveal the impact of the Belt and Road Initiative on the economic development of node cities. X represents a series of control variables, θ and μ are fixed effect at the city and year levels, respectively. ε represents the random disturbance term.

3.2. Variable Selection and Descriptive Statistics

a) Explained variable: the economic development level. Referring to Lv et al. (2019), this paper uses the logarithm of node city GDP to represent the economic development level of the node city.

b) Key explanatory variable: the Belt and Road initiative. The impact of the

initiative on the economic development of node cities along the route is measured by which represents the interaction term between the dummy variable of implementing the initiative and the dummy variable of time. Treat = 1 represents the 25 Belt and Road node cities mentioned above, treat = 0 represents non-Belt and Road node cities; Since 2015 was the first year to officially transform the Belt and Road construction from concept to action, this paper sets 2015 as the implementation time of the initiative, dummy variable takes the value of 0 before 2015 and 1 in 2015 and onwards.

c) Control variables: Considering that there are many factors that can promote economic development, if these factors are not well controlled, they will interfere with the empirical results. In order to obtain accurate experimental results, refer to the studies of Liu and Zhao (2015) and Wu and Han (2022), six variables including fixed investment level (Fix), foreign direct investment level (Fdi), education level (Edu), government scale (Gov), science and technology expenditure ratio (Tec) and employment level (Emp) were added to the empirical model as a series of control variables affecting economic development. The specific meanings and descriptive statistics of all variables are shown in Table 1 and Table 2 respectively.

Table 1. Meaning and calculation method of variables.

| Types | Variables | Meaning | Calculation |
|--------------------------|-----------|--|---|
| Explained variable | Lngdp | GDP | The logarithm of city GDP |
| Key explanatory variable | Treat | Node cities of the Belt and Road | The node city is 1, otherwise 0 |
| | Post | Time indicator | Take 1 before 2015, otherwise take 0 |
| Control variables | Fix | Fixed investment | The proportion of fixed assets investment in the city's GDP |
| | Fdi | Foreign direct investment | Proportion of the actual utilization of FDI in GDP |
| | Edu | Education level | The proportion of students in regular colleges and universities in the total population of the region |
| | Gov | Government scale | Proportion of government budgetary expenditure in regional GDP |
| | Tec | Science and technology expenditure ratio | Government spending on science and technology as a share of GDP |
| | Emp | Employment level | The proportion of employees in the total population of the region |

Table 2. Descriptive statistics.

| Variables | Obs. | Mean | Std. Dev. | Min. | Max. | Med. |
|-----------|------|--------|-----------|-------|-------|-------|
| Lngdp | 3014 | 7.250 | 0.965 | 4.497 | 10.55 | 7.172 |
| Treat | 3014 | 0.0876 | 0.283 | 0 | 1 | 0 |
| Post | 3014 | 0.455 | 0.498 | 0 | 1 | 0 |

Continued

| | | | | | | |
|-----|------|-------|-------|-------|-------|-------|
| Fix | 3014 | 78.13 | 29.48 | 21.00 | 177.0 | 75.41 |
| Fdi | 3014 | 25.70 | 26.17 | 0 | 123.1 | 17.33 |
| Edu | 3014 | 147.6 | 183.6 | 1.587 | 900.8 | 84.84 |
| Gov | 3014 | 19.62 | 10.11 | 7.126 | 62.48 | 16.88 |
| Tec | 3014 | 24.96 | 21.20 | 3.206 | 122.5 | 17.98 |
| Emp | 3014 | 11.66 | 6.439 | 3.812 | 36.81 | 9.694 |

Source: China city statistical yearbook 2009-2019, China statistical yearbook for regional economy 2010-2014 and provincial statistical yearbook.

3.3. Sample and Data

Considering the availability and validity of data, this study selects 274 prefecture-level cities from 2009 to 2019 as research samples. The data mainly come from China City Statistical Yearbook, China Statistical Yearbook for Regional Economy, provincial and municipal statistical yearbook and statistical bulletin. The research samples were processed according to the following criteria: (a) Cities with serious data deficiency were excluded; (b) Filling in missing data by linear interpolation; (c) In order to eliminate the effect of extreme values, a 1% tailing treatment is applied to the main continuous variables.

4. Empirical Results

4.1. The Tests of Parallel Trends Assumption

The effectiveness of the difference-in-differences model depends on the assumption of parallel trends between the treatment and control groups and the certainty of policy timing. The underlying assumption is that, in the absence of policy intervention, individual change tendencies are the same in both groups, and that any observed differences can be attributed to policy treatment effects. Only when this precondition is satisfied, the DID model can provide reliable results of policy effects. In order to ensure the validity of the parallel trend hypothesis and the uniqueness of policy timing, the following tests are carried out in this study. The model to test the parallel trend hypothesis is as follows:

$$\text{Lngdp}_{it} = \beta_0 + \beta_1 \sum_{t=2009}^{2019} \text{Treat}_i \times \text{Year}_t + \gamma X_{it} + \theta_i + \mu_t + \varepsilon_{it} \quad (2)$$

Based on the practice of mainstream literature, the first year of the sample is chosen as the base year in this study. By analyzing the regression coefficients for the pre-policy years, it is possible to determine whether the parallel trend hypothesis is satisfied in the treatment and control groups. Based on the observations in **Figure 1**, the following conclusions can be drawn.

In the years before the implementation of the policy, there was no significant difference between the regression coefficient of $\text{Treat} \times \text{Year}$ and zero, indicating that the evolution trend of relevant factors in the treatment group and the

control group was similar before the implementation of the policy. In the year of policy implementation, the regression coefficient is also not significantly different from zero. However, the regression coefficient was significantly greater than zero in the year after the implementation of the policy, and gradually increased with the passage of time, indicating that there was a significant difference in the economic growth trend between the treatment group and the control group after the implementation of the policy, and the dynamic effect was significantly enhanced. Therefore, according to the results in **Figure 1**, it can be concluded that the DID model satisfies the parallel trend hypothesis.

The possible reasons for this phenomenon are: in the short term, due to the low degree of policy perfection in various regions, the imperfect supporting facilities and the lack of detailed implementation rules, the policy effect of the Belt and Road initiative is not obvious in the early stage. With the passage of time, the Belt and Road policy has been gradually publicized and deeply implemented, and various regions have gradually deepened their understanding of the initiative, gradually improved the policies and related supporting facilities and detailed guidance plans, and gradually increased their participation in the Belt and Road initiative. Therefore, the promoting effect of the Belt and Road Initiative on the economic development of key prefecture-level cities along the route gradually emerge over time.

4.2. Baseline Regression Results

This paper first evaluated the net effect of the Belt and Road Initiative on the economic development of node cities along the route through the DID model. The regression results are shown in **Table 3**, where column (1) is the estimated results without adding control variables, and column (2) is the results with adding control variables. It can be found that when the control variables are not added in, the coefficient of the core explanatory variable is significantly positive at the 1% level, and the coefficient is still significant after the control variable is added, indicating that the Belt and Road Initiative has a significant promoting effect on the economic growth of node cities along the route.

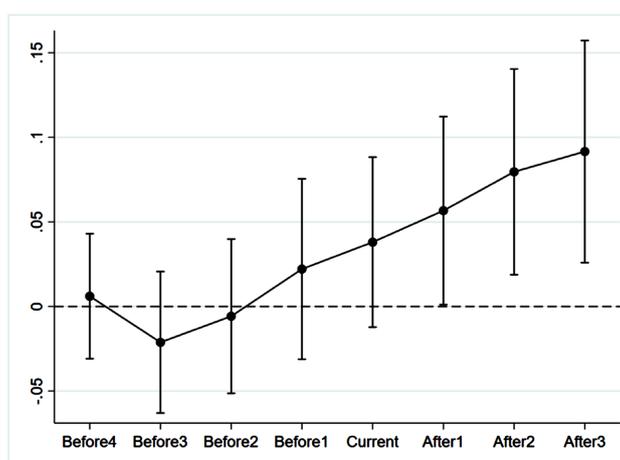


Figure 1. Parallel trend test result.

Table 3. Baseline regression results.

| | (1) Lngdp | (2) Lngdp |
|----------------|-----------------------|-----------------------|
| Treat × Post | 0.112*** (4.286) | 0.070*** (3.366) |
| Fix | | 0.001*** (2.892) |
| Fdi | | 0.001*** (2.775) |
| Edu | | -0.000 (-0.607) |
| Gov | | -0.023*** (-7.186) |
| Tec | | 0.001** (2.108) |
| Emp | | 0.006*** (4.023) |
| _cons | 6.673*** (832.731) | 6.871*** (93.500) |
| City effect | YES | YES |
| Year effect | YES | YES |
| N | 3014 | 3014 |
| R ² | 0.809 | 0.878 |

Note: *, **, *** represent statistical significance at the level of less than 10%, 5%, and 1%, respectively. The t value is in parentheses under the coefficient.

4.3. Robustness Tests

4.3.1. Placebo Test

In order to test to what extent the above results are affected by missing variables and random factors, referring to (Ferrara et al., 2012) and (Li et al., 2016), this paper randomly “screens” node cities along the Belt and Road Initiative and randomly generates the reform time. Based on this, a two-level random experiment of reform time and city was constructed. The reliability of the conclusion is judged according to the probability of the estimation coefficient from the spurious experiment. To further enhance the power of the pla-

cebo test, the process was repeated 500 times, and the distribution of the estimated coefficients of $\text{Treat} \times \text{Post}$ was plotted. Based on this, we verify whether the economic developments of node cities along the routes are significantly affected by other factors besides the Belt and Road initiative. If the estimated coefficients under random treatment are distributed around 0, it means that there is no important influencing factor omitted from the model. In other words, the influence effect in the benchmark regression is indeed the result of the Belt and Road policy.

As can be seen from the distribution diagram of the estimated coefficients reported in **Figure 2**, the estimated coefficients of the false interaction terms are concentrated around 0, indicating that there is no serious problem of missing variables in the model setting, and the core conclusion is still robust.

4.3.2. PSM-DID Test

In order to alleviate the errors caused by the systematic differences of the observable variables and the setting of the baseline regression model, this paper further adopts the propensity score matching Difference-in-Difference (PSM-DID) method to reconstruct the samples and conduct the robustness test. In this paper, the logit regression of indicator variable (Treat) of the Belt and Road to the control variables such as fixed investment level, foreign direct investment level, education level and government size is carried out to obtain the tendency score. Then, methods of nearest neighbor 1:1 matching, radius matching and kernel matching are adopted to match prefecture-level cities, and then the matched samples are used for baseline regression. The results are shown in **Table 4**.

As can be seen from **Table 4**, the coefficient of $\text{Treat} \times \text{Post}$ is significantly positive, and the value is larger than that in the baseline regression, which indicates that the policy effect becomes stronger after using more accurate matching samples, which is also consistent with the expectation.

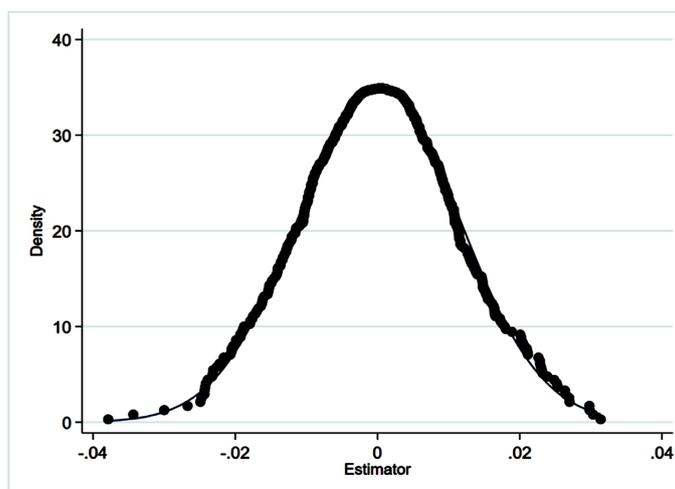


Figure 2. Placebo test.

Table 4. Robustness test of PSM-DID.

| Lngdp | (1) Nearest neighbor matching | (2) radius matching | (3) kernel matching |
|----------------|----------------------------------|------------------------|------------------------|
| Treat × Post | 0.088*** (2.423) | 0.075*** (3.595) | 0.106*** (4.866) |
| Controls | YES | YES | YES |
| City effect | YES | YES | YES |
| Year effect | YES | YES | YES |
| N | 1954 | 1946 | 1946 |
| R ² | 0.935 | 0.878 | 0.893 |

Note: *, **, *** represent statistical significance at the level of less than 10%, 5%, and 1%, respectively. The t value is in parentheses under the coefficient.

5. Discussion

5.1. Potential Mechanisms

Through empirical test, this paper finds that participation in the Belt and Road construction promotes the economic growth of node cities along the route, but through what channels still needs further study. Based on the theoretical analysis above, this paper surmises that the upgrading of industrial structure is an important mechanism for the Belt and Road Initiative to promote the economic growth of node cities along the route. This paper examines the mechanism of the Belt and Road Initiative on economic growth from the two aspects of industrial structure rationalization and industrial structure upgrading.

Following the matching approach of [Gan et al. \(2011\)](#), we uses Theil index (TL) to measure the rationalization of industrial structure. If the economy is in equilibrium, $TL = 0$, and the larger the TL value, the more irrational the industrial structure. Besides, the service-oriented economic structure promoted by informatization is an important feature of industrial structure upgrading. Considering that a typical fact is that the growth rate of the tertiary industry is faster than that of the secondary industry, we use the ratio of the output value of the tertiary industry to the output value of the secondary industry (TS) to measure the upgrading of the industrial structure. The greater the ratio, the higher the industrial structure.

Table 5 reports the potential mechanism tests. Industrial structure rationalization (TL) and industrial structure upgrading (TS) are significant at the levels of 1% and 10%, respectively, indicating that the Belt and Road Initiative has significantly improved the industrial structure rationalization and industrial structure upgrading of node cities along the route. It is believed that the upgrading of industrial structure is the intermediary mechanism that the construction of Belt and Road promotes the economic growth of node cities.

Table 5. Potential mechanism tests.

| | (1) TL | (2) TS |
|----------------|-------------------------|---------------------|
| Treat × Post | -128.779*** (-2.798) | 0.088* (1.702) |
| Controls | YES | YES |
| City effect | YES | YES |
| Year effect | YES | YES |
| _cons | 1340.701*** (14.47) | 0.821*** (15.62) |
| N | 3014 | 3014 |
| R ² | 0.051 | 0.571 |

Note: *, **, *** represent statistical significance at the level of less than 10%, 5%, and 1%, respectively. The t value is in parentheses under the coefficient.

5.2. Heterogeneity Analysis

Considering that China's economic development is currently uneven between coastal and inland regions, affected by different resource endowments, geographical environments and economic bases, is there any difference in the impact of the Belt and Road Initiative on economic growth in different regions? In order to better understand the impact of the Belt and Road Initiative on the economic development of node cities along the route, this paper conducts a series of heterogeneity tests from the perspective of economic development level, coastal or not.

5.2.1. Developed Cities and Less Developed Cities

As mentioned in hypothesis H2, compared with less developed cities, developed cities tend to have a higher base level of industrial rationalization and industrial upgrading, so the space for improvement is smaller and it's more difficult. Therefore, the effect of the initiative on developed cities will be lower than that of less developed cities. In order to verify this hypothesis, dummy variable *Development* are introduced. If the city's GDP in 2015 is higher than the national average, the value of the variable is 1, otherwise 0. The triple difference term *Treat × Post × Development* is introduced into the benchmark regression formula.

As can be seen from column (1) of **Table 6**, the estimated coefficient of the triple difference term is negative and significant at the level of 5%, that is, the driving effect of the initiative on the economy of less developed cities is stronger than that of developed cities, showing a marginal decreasing trend. This means that less developed cities are expected to narrow the economic development gap with developed cities through the Belt and Road platform and jump out of the "Matthew effect" cycle.

Table 6. Heterogeneity analysis.

| | (1) | (2) |
|----------------------------|----------------------|-----------------------|
| Treat × Post | 0.076*** (2.324) | 0.140*** (6.85) |
| Treat × Post × Development | -0.021** (-2.008) | |
| Treat × Post × Coast | | -0.074*** (-2.663) |
| Controls | YES | YES |
| City effect | YES | YES |
| Year effect | YES | YES |
| _cons | 6.871*** (93.327) | 6.766*** (101.213) |
| N | 3014 | 3014 |
| R ² | 0.878 | 0.867 |

Note: *, **, *** represent statistical significance at the level of less than 10%, 5%, and 1%, respectively. The t value is in parentheses under the coefficient.

5.2.2. Coastal Cities and Inland Cities

Based on the same hypothesis H2, on the one hand, developed cities are often located in the coastal areas, and less developed cities are often located in the inland areas. On the other hand, inland areas tend to have more abundant land, minerals and labor resources waiting for development, and have greater economic growth potential and late-comer advantages. Therefore, the impact of the initiative on inland cities will be stronger than that on coastal cities. Similarly, the dummy variable *Coast* and the triple difference term *Treat × Post × Coast* are introduced into the regression formula.

As can be seen from column (2) of **Table 6**, the regression coefficient of the triple difference term is negative and significant at the level of 1%, that is, the economic benefits of inland cities affected by the initiative are higher than those of coastal cities, and H2 is verified. The above results may be because the opening of the China-Europe railway trains and the smooth investment channels have opened a rail channel to the major trading countries in Europe for inland and less developed regions, helped the rapid integration and upgrading of industries and an acceleration in economic growth of inland cities.

6. Conclusions and Policy Implications

6.1. Conclusion

Taking the Vision and Actions for Jointly Building the Silk Road Economic Belt and the 21st Century Maritime Silk Road published in 2015 as a quasi-natural experiment, this paper constructs a two-way fixed-effect model and empirically tests

the impact of the Belt and Road Initiative on the economic growth of node cities along the route and its mechanism by taking 274 prefecture-level cities in China from 2009 to 2019 as samples. The results show that the Belt and Road initiative has a significant promoting effect on the economic growth of node cities along the route, which is still robust under the test of placebo test and PSM-DID model, and promoting the rationalization and upgrading of the industrial structure of node cities along the route is an important mechanism. Heterogeneity test shows that the promotion effect is more significant in less developed cities and inland cities.

China is the initiator and promoter of the “Belt and Road” initiative, while domestic node cities are the pioneers in enjoying policy effects and driving economic reform. This study not only verifies the economic growth benefits of trade opening, the resource allocation and industrial optimization effects of the “Belt and Road” Initiative at the theoretical level. From the practical level, this paper also provides reliable expectations and clearer practical paths for different types of Chinese cities to realize economic growth by using the “Belt and Road” platform.

6.2. Policy Implications

Based on the empirical results and relevant realities, the following policy implications are drawn.

Firstly, key provinces and node cities along the route should respond to the call of the national policies, actively participate in the construction of the Belt and Road, and promote the upgrading of industrial structure through the foreign economic cooperation. Relevant government departments should strengthen the contact with countries along the Belt and road, jointly promote the reduction of bilateral trade and investment barriers, and actively promote traditional infrastructure such as road and rail transportation and energy transportation networks and new infrastructure such as 5G base stations, industrial Internet and cross-border e-commerce platforms to facilitate bilateral trade and investment activities. The government should give appropriate tax incentives and financial subsidies to enterprises participating in the Belt and Road construction, encourage them to explore the international market, transfer excess capacity, and realize their own transformation and upgrading.

Secondly, take inland cities as the main focus and promote the deep integration of the central and western regions into the construction of the Belt and Road. The research shows that the initiative has a significantly stronger role in promoting the economy of inland and less developed cities than that of coastal and developed cities. Therefore, inland areas should be placed in a more important position in the construction of the Belt and Road and its policies should be appropriately tilted. It is necessary to speed up the opening of transport lines in the central and western regions, realize the “grid-connected” operation with the Belt and Road infrastructure, so as to strengthen economic and trade cooperation and exchanges with countries along the route, and help inland less developed cities take the Belt and Road express train to achieve economic catch-up.

Thirdly, when formulating the policy system of the Belt and Road initiative, the government should highlight the positioning and industrial characteristics of key provinces along the route, but also emphasize the integrity and coordination of inter-provincial development. On the one hand, the government should encourage cities with comparative advantages to strengthen economic and trade exchanges cooperation with countries along the Belt and Road, and promote industrial transfer and technological upgrading. On the other hand, cities with weak comparative advantages should be encouraged to strengthen cultural exchanges with countries along the route through the construction of sister cities, to promote service trade, and improve the proportion and efficiency of the tertiary industry. And cities with weak comparative advantages should be encouraged to strengthen cooperation in science, technology and education with countries along the Belt and Road, optimize the industrial structure through learning and accumulation. In addition, it is necessary to give full play to the comparative advantages of the lower cost of manpower, land and other resources in the central and western regions, establish a cooperation mechanism to undertake industrial transfer from the east, and cultivate a number of manufacturing gradient transfer bases. At the same time, the radiation role of important node cities such as Xi'an, Chengdu and Chongqing should be brought into play to drive other less developed cities in the central and western regions to improve the efficiency of industrial development.

6.3. Prospect

It should be noted in particular that, due to the limited availability of data, the assessment in this paper is actually a short-term effect of the "Belt and Road" Initiative on node cities, and the long-term effect assessment of this policy is still a direction that can be further promoted in the future. In addition, only 25 node cities mentioned in the initiative are selected in this paper, most of which are provincial capitals or important port cities, which has its particularity. Empirical analysis of the economic growth effects of the Belt and Road Initiative based on the broader treatment group is pending.

Conflicts of Interest

The author declares no conflict regarding the publication of this paper.

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