ISSN: 2637-6067 DOI: 10.6918/IJOSSER.202207_5(7).0078

Research on the Effect of the Belt and Road Initiative on Trade

-- An Empirical Analysis Based on the Difference-in-differences Method

Shuxuan Wu[1,*]

[1]School of finance and economics, Jiangsu University, 212013, Zhenjiang, China

[*]Email: wushuxuan1231@163.com

Abstract

With the implementation of the Belt and Road Initiative, the economic and trade exchanges between the countries along the routes have been strengthened. Under this background, this paper selects 8 indicators such as per capita GDP, the final consumption expenditure of residents and the proportion of city population in the total population of 148 countries over 10 years. The conclusion is that the Belt and Road Initiative will promote the volume of trade of the countries along the routes.

Keywords

The Belt and Road Initiative; DID; International trade.

1. Introduction

The proposal of the Belt and Road Initiative aims at creating an open, inclusive, balanced and regional economic cooperation framework and achieving win-win and shared development. Maintaining the smooth flow of international trade is one of the core concepts of the Belt and Road Initiative. Trade and investment cooperation is also the basic driving force for all countries to participate in the Belt and Road Initiative construction. According to the statistics of the Ministry of Commerce, from 2013 to 2019, the cumulative total amount of goods trade between China and countries along the line exceeded US $7.8 trillion. After the outbreak of covid-19 pandemic in 2020, the trend of deglobalization and trade protectionism were rising. China's the Belt and Road Initiative construction has played an important role in promoting economic and social recovery in the face of this international cooperation. The central European and Thai silk shipping operations continue to operate and expand, providing the world with "made in China". Therefore, the Belt and Road Initiative will bring significant impetus to the trade of the countries along the line. It is of great theoretical value for China to promote international cooperation via the Belt and Road Initiative to a higher level in the post epidemic era.

Since its implementation, the Belt and Road Initiative has been a concern for the academia. Difference-in-differences model, as a common method to evaluate the implementation effect of the policy, is widely used to evaluate the effect of the Belt and Road Initiative. Guan Jialin, Lv Xinmeng and Wang Jianing (2020) selected control variables such as savings rate and total tax rate to test the effect of the "belt and road initiative" on the growth of foreign trade in the 83 countries by using the panel data of 83 countries in the past five years, finding that countries along the routes achieved remarkable results in foreign trade. Sun Churen, Zhang Nan and Liu Yaying (2017) conducted a study to figure out the impact of the Belt and Road Initiative on exports in our country, basing on control variables such as per capita GDP, population and railway from 1997-2015. They finally found that the Belt and Road Initiative has significantly promoted China's export growth to the countries along the line.

ISSN: 2637-6067 DOI: 10.6918/IJOSSER.202207_5(7).0078

The marginal contribution of this paper lies in: using the latest data up to 2018; the relevant variables are added, deleted and improved on the basis of existing studies; eight control variables are selected, including per capita GDP, final consumption expenditure of residents, the proportion of urban population in the total population, the number of branches of commercial banks, the total population, air transport freight volume, applicable tariff rate and labor force participation rate. This study aims to construct a difference-in-differences model to analyze whether the Belt and Road Initiative has promoted the changes of total import and export volume along the line.

2. Methodology

2.1. Research Design

This study quantifies the impact of the Belt and Road Initiative on the volume of import and export of countries along the routes, using difference-in-differences model. The implementation of the Belt and Road Initiative is deemed as a quasi natural experiment. The specific measurement model is designed as follows.

$$\text{lntrade}_{it} = \beta_0 + \beta_1(\text{treat}_i \cdot \text{policy}_t) + \gamma Z_{it} + \lambda_i + \mu_t + \varepsilon_{it} \quad (1)$$

In equation (1), I (=1,2,3, …, 148） represents the country, t (=2009,2010, …, 2018) represents the year. Dependent variable lntrade_{it} represents the total volume of import and export of country i in year t. State dummy variable treat_i reflects whether this country is a country along the route, and if it is, this variable is set 1, otherwise 0. As the Belt and Road Initiative was introduced in September 2014, time dummy variable policy_t is used to reflect whether this year is behind 2014, and if it is, this variable is set 1, otherwise 0. The estimation of DID, which is referred as $\text{treat}_i \bullet \text{policy}_t$, is an interaction of state dummy variable and time dummy variable. β_1 is the coefficient before the core independent variable, whose economic implication is the influence of the Belt and Road Initiative on the total import and export volume of the countries along the line. λ_i denotes the fixed effect of the country, considering the trade level varies from country to country and the choices of partners are not random. μ_t denotes the fixed effect of the year, as the total import and export volume of each country itself will change with time.

Z_{it} is other factors affecting the change of total import and export volume of various countries. Combined with current researches, this paper selects the following control variables:①per capita GDP (lnrjgdp), reflecting the living standards of people in all countries;②the final consumption expenditure of residents(lnconsumption), reflecting the volume and scale of consumer markets in various countries;③the proportion of urban population in the total population(urban), reflecting the urbanization level of various countries and affects the social and economic level of a country to a certain extent;④the number of branches of commercial banks(bank), reflecting the development level of financial infrastructure in various countries;⑤total population(lnpeople), reflecting the size and potential of national markets;⑥air freight volume (air), reflecting the level of air transport in various countries;⑦the applicable tariff rate(tariff), reflecting the openness of countries' foreign trade;⑧ labor participation rate(labor), reflecting the degree of people's participation in economic activities and affects the supply of goods and services in a country.

2.2. Sampling Design

This paper adopts the consolidated data in the world economic database of drcnet, and sets the time dimension of the sample as 2009-2018, including relevant information from 148 countries and regions, involving 57 countries along the line. There are 1480 observations in total.

ISSN: 2637-6067 DOI: 10.6918/IJOSSER.202207_5(7).0078

3. Empirical Results and Analysis

3.1. Regression Analysis

Table 1. Regression Analysis

Independent Variables	(1)	(2)
treati • policyt	0.733***	0.393***
	(4.10)	(0.063)
lnrjgdp	——	0.893***
		(0.077)
lnconsumption	——	0.267***
		(0.083)
urban	——	0.006***
		(0.002)
bank	——	0.009***
		(0.002)
lnpeople	——	0.544***
		(0.085)
air	——	0.003***
		(0.0710.)
tariff	——	-0.053***
		(0.006)
labor	——	0.010***
		(0.002)
R^2	0.012	0.889

This paper uses the model above to study whether the Belt and Road Initiative has facilitated the trade of countries along the routes. Column (1) reports the regression results when no control variables are added; Column (2) reports the regression results after adding control variables. From the table above, it can be seen that the Belt and Road Initiative has a significant positive effect on the total import and export volume of the countries along the routes. Although the coefficient becomes smaller after adding several control variables, it is still significantly positive. Per capita GDP, residents' final consumption expenditure, the proportion of urban population in the total population, the number of branches of commercial banks, the total population, air transport freight volume and labor participation rate all play a significant role in promoting the total import and export volume of each country. The coefficient of tariff variable is significantly negative. Obviously, the rise of tariff rate will cause trade barriers.

3.2. Parallel Trend Test

A crucial premise of DID is that the experiment group and the control group have the same trend before the implementation of the policy, which means that the total volume of import and export of countries along the routes and others show a common trend. This paper uses the following equation to test the trend change from three years before to after the implementation of the policy:

$$\ln trade_{it} = \beta_0 + \beta_k \sum_{k\geq -3}^{3+} (treat_i \cdot policy_{2013+k}) + \gamma Z_{it} + \lambda_i + \mu_t + \varepsilon_{it} \quad (2)$$

According to the following figure, the regression results of variables before 2014 are not significant, showing that the experiment group and the control group have the same tendency before the implementation of the policy.

ISSN: 2637-6067 DOI: 10.6918/IJOSSER.202207_5(7).0078

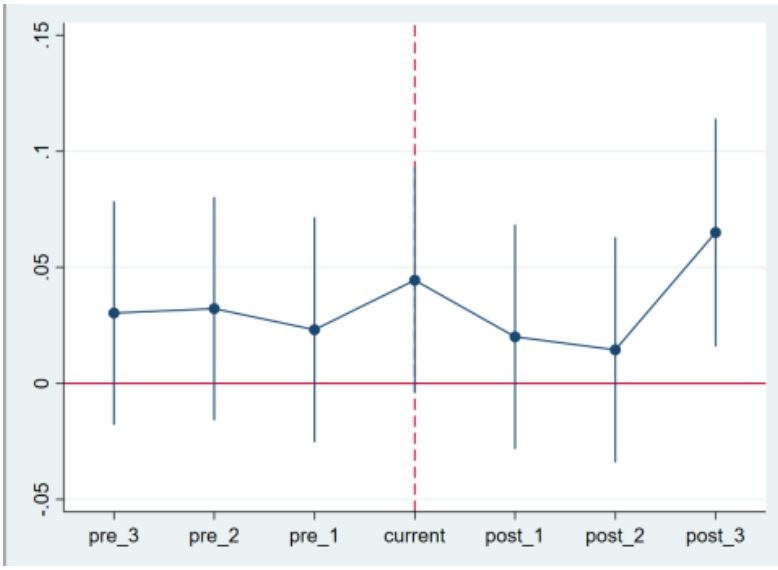

Figure 1. Variable regression

3.3. Placebo Test

3.3.1. Placebo Test for the Time of Policy Applied

In order to ensure the robustness of the above empirical results, this paper assumes that the Belt and Road Initiative was proposed before 2013, and invents the policy time of 2010, 2011 and 2012 respectively for regression. As shown in the following table, the coefficients of the core explanatory variables are not significant, indicating that the growth of foreign trade of countries along the line is indeed promoted by the Belt and Road Initiative, rather than caused by other potential factors or random events.

Table 2. 2010, 2011 and 2012 policy time for regression

	2010	2011	2012
treati • policyt	0.0458	0.0584	0.0326
	(0.063)	(0.047)	(0.059)
R^2	0.775	0.802	0.778

3.3.2. Placebo Test for the Experiment Group

In view of the full completion of the China-ASEAN Free Trade Area in 2010, this paper excludes the ten members of ASEAN in the sample for regression analysis again in order to eliminate other policy interference. The results show that the estimated coefficient before the policy dummy variable is 0.129, which is significant at the level of 5%, and passes the placebo test.

4. Countermeasures

Based on the macroeconomic data of 148 countries from 2009 to 2018, this paper makes an empirical analysis to confirm that the Belt and Road Initiative has indeed promoted the trade of countries along the line. The current global epidemic has led to the bankruptcy of a large number of enterprises, which has dealt a heavy blow to the economies of all countries. Under the epidemic prevention and control measures, countries are also basically cautious about trade. Facing such severe objective conditions, building the Belt and Road should find a breakthrough and innovate its development model to play a positive role in economic recovery.

ISSN: 2637-6067 DOI: 10.6918/IJOSSER.202207_5(7).0078

4.1. Promote Cooperation on Digital Economy

In recent years, artificial intelligence, big data, Internet of things and other new generation information technologies have developed rapidly. Digital economy has injected new growth power into contemporary economy and society. COVID-19 is prompting many enterprises to digitalization, and mobile payment, e-commerce and other new formats gradually mature. We should accelerate the construction of members' digital platforms and promote the digitization of trade methods and trade objects of countries along the line to cultivate new growth points for their trade development.

4.2. Develop Green Economy

In this year's government work report, the brand new word "emission peak and carbon neutrality" has also been mentioned again. The Belt and Road Initiative should comply with the trend of global green and low-carbon transformation and encourage countries along the line to carry out green technological innovation in the design, manufacturing, packaging, logistics and other aspects of trade circulation products and services, building an international supply chain and value chain of green industry, improving green competitiveness and winning new competitive advantages.

References

[1] LYU Yue，LU Yi，WU Songbo and WANG Yong. The Effect of the Belt and Road Initiative on Firms' OFDI: Evidence from China's Greenfield Investment [J]. Economic research journal,2019,54(09):187-202.

[2] SONG Tian, ZHANG Jun. How does the Belt and Road Initiative affect China-EU service trade——An empirical analysis based on the difference-in-differences method [J]. Prices monthly,2021(02):43-51.

[3] Tian-tian Feng, Qi Kang, Bin-bin Pan. Synergies of sustainable development goals between China and countries along the Belt and Road initiative [J]. Current Opinion in Environmental Sustainability,2019,39(C).

[4] Zhihui Leng, Jing Shuai, Han Sun. Do China's wind energy products have potentials for trade with the "Belt and Road" countries?——A gravity model approach [J]. Energy Policy,2020,137(C).

[5] Li, Lai, Wang. The preliminary effectiveness of bilateral trade in China's belt and road initiatives: a structural break approach [J]. Applied Economics,2019,51(35).