An Analysis of the Potential of Import and Export Trade between China and the Countries along the Belt and Road

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Abstract. Based on the trade data of China's import and export with the countries along the line, the paper calculates and analyzes the proportion and change characteristics of China's total import and export volume with the countries around the world, uses the dominant comparative advantage index , and explores the industrial correlation between China and the countries along the "one belt and one road" based on China's own comparative advantage. Trade tightness. On the basis of this, we introduce the stochastic frontier gravity model and empirically study analysis of the trade efficiency between China and the "one Belt and one Road" countries, in order to look forward to the future trend and development of China's "one belt and one road" initiative.

1. Introduction

In promoting economic cooperation and development between China and the countries and regions along the route, trade is the focal point and foundation for the development of the initiative.On this context, we need to explore the future trade potential of China and the countries along the route, and the main factors that influence the trade potential. Based on the comparative advantage of China and the gravity model, this paper discusses the import and export efficiency and potential trade potential, hoping to truly achieve the great ideal of mutual benefit and common development.

2. Analysis of trade development between China and the countries along the Belt and Road

2.1 The total volume of trade between China and countries along the route

Over the past 10 years, China's total trade volume, import volume and export volume along the "one belt and one road" have been increasing. The countries and regions along the "one belt and one road" have increasingly become China's important export markets and import sources. In addition,the status of the countries along the route has been increasing.

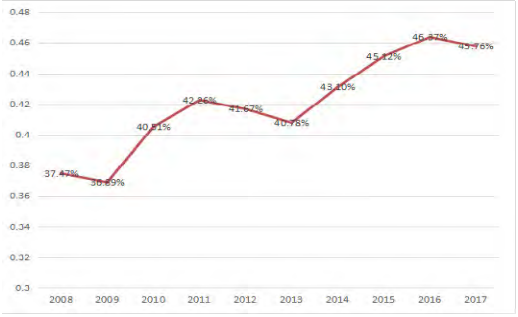

Fig. 1. China of The Belt and Road along the country's total trade accounted for Chinese of world trade ratio (2008-2017)

2.2 Analysis of dominant comparative advantage index

The dominant comparative advantage index is used to measure whether a country has a comparative advantage over other countries in a certain industry. The formula for calculating the dominant ratio-advantage index is as follows:

$$RCA_{ij} = \frac{X_{ij} / X_i}{X_{wj} / X_w} \tag{1}$$

Among them, indicates the dominant comparative advantage index of country i on j products; indicates the export volume of country i on j products in this year; indicates the total export volume of country i on each products in this year; indicates the total export volume of country j products in the world in this year; indicates the total export volume of each product in this year.When $0 < RCA < 1$, it indicates that country i has comparative disadvantage in this year's export of j products.The closer numerical value is to 0, the disadvantage is more obvious; $RCA > 1$ indicates that i country has a comparative advantage in the export of j products in this year, and the larger value make the demonstrative comparative advantage.Based on the above formulas, we can calculate the dominant comparative advantage index of 0-9 products:

Table 1. Dominant comparative advantage index of ten categories of products in China(2008-2017)

CA Y	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
0 product categories	0.4206	0.4343	0.4554	0.46	0.4376	0.4252	0.4104	0.4043	0.4478	0.4213
1 product categories	0.1349	0.1519	0.1548	0.1587	0.16	0.1473	0.1529	0.1732	0.1925	0.1962
2 product categories	0.2284	0.199	0.1793	0.1799	0.1708	0.1673	0.181	0.1773	0.1803	0.1783
3 product categories	0.1626	0.1463	0.1272	0.1063	0.0976	0.096	0.0987	0.1232	0.1496	0.1367
4 product categories	0.117	0.0663	0.0456	0.0478	0.0472	0.0535	0.0556	0.058	0.0534	0.0546
5 product categories	0.5081	0.433	0.489	0.5483	0.5151	0.5069	0.5296	0.5078	0.5085	0.5068
6 product categories	1.3221	1.2024	1.2124	1.2844	1.3038	1.3351	1.3718	1.3652	1.3606	1.3782
7 product categories	1.3051	1.3903	1.4056	1.4386	1.4204	1.4309	1.3487	1.2774	1.2545	1.2649
8 product categories	2.1694	2.0743	2.1183	2.234	2.3227	2.3283	2.251	2.0172	2.0058	2.1235
9 product categories	0.0258	0.0252	0.0196	0.0273	0.0124	0.0135	0.0196	0.018	0.0435	0.0296

As can be seen from Table 2, China has been dominant in six categories (manufactured goods by material classification), seven categories (machinery and transport equipment) and eight categories (miscellaneous manufactured goods). China is rich in labor resources and relatively weak in capital technology. Therefore, in the past decade, China's exports mainly focus on labor-intensive products. Then, with the advancement of China's modernization process and the development of science and technology, while maintaining the position of labor-intensive products in the world, we actively seek capital and technological endowment, which makes the comparative advantage index of capital-intensive products gradually rise. It can be predicted that in the next few years, we should strengthen the export of labor-intensive products to countries with scarce labor resources, but still need to strengthen trade with countries with abundant capital and technological endowments to meet domestic production and living needs.

3. Empirical analysis of trade potentials between China and countries along the route

3.1 Model setting and variable description

In this paper, the stochastic frontier approach is applied to the traditional gravity model, and the stochastic frontier gravity model is established to study the export potential and total trade potential of China along the "one Belt and one Road" country.The gravitational equation of the front edge of the test machine is established as follows:

$$\ln TR_{ijt} = \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 GDP_{jt} + \beta_3 Dist_{ij} + \beta_4 Border_{ij} + \beta_5 Deva_{ij} + v_{ijt} - u_{ijt} \quad (2)$$

Among them, $\ln TR_{ijt}$ indicates the natural logarithmic value of total imports and exports of China and j in the year t; β_0 is a constant term; $\ln GDP_{it}$ represents the natural logarithmic value of GDP of China in the year t; $\ln GDP_{jt}$ represents the natural logarithmic value of GDP of j in the year t; Both of them anticipates a positive correlation with TR_{ijt} ; $\ln Dist_{ij}$ represents the logarithmic value of the distance between China and j; $Border_{ij}$ is a fictitious variable. If there is a common relationship between the two countries, it values 1, otherwise values 0; The fictitious variable $Dave$ indicating the impact of the sharp devaluation of the euro area currency in 2015 is assigned to 1 by the affected countries in the corresponding years, and the rest is 0; $\beta_1 - \beta_5$ is regression coefficient; $v_{ijt} - u_{ijt}$ is standard random error.

3.2 Sample selection and data sources

This paper selects 10 countries along the belt and road from 2008 to 2017 as samples, including Philippines, Indonesia, Malaysia, Russian Federation, Pakistan, India, Iran, Saudi Arabia, Turkey and Poland to analyze the trade potential of China and the countries along the "one Belt and one Road", expecting the future direction and strategy of China's "one belt and one road" initiative.

3.3 Analysis of empirical results

In this paper, Stata software is selected to use random effect model to regress the gravitational model. As shown in Table 3, random effect model regression was carried out for all variables and single dummy variables respectively. We can see the most of the explanatory variables accorded with 1% significance level test, and the variable symbols accorded with expectations.

Table 2.Empirical results of trade gravity models between China and countries along the "one Belt and one Road"

VARIABLES	$\ln TR_{ijt}$	$\ln TR_{ijt}$	$\ln TR_{ijt}$	$\ln TR_{ijt}$
$\ln GDP_{it}$	0.507***	0.519***	0.518***	0.610***
	(0.0572)	(0.0628)	(0.0515)	(0.0509)
$\ln GDP_{jt}$	0.992***	1.040***	1.007***	1.016***
	(0.0557)	(0.0523)	(0.0525)	(0.0513)
$Dist_{ij}$	-1.280**	-1.464**	-1.401**	-1.438**
	(0.575)	(0.609)	(0.576)	(0.587)
$Border_{ij}$	-0.951*	-0.948*		
	(0.0521)	(0.0612)		
$Deva$	-0.120***			-0.103**
	(0.0404)			(0.0402)
Constant	-16.18***	-16.19***	-15.82***	-18.46***
	(4.945)	(5.065)	(4.734)	(4.794)

The analysis results show that：

(1)The coefficient of ln *GDP* is positive and has passed the 1% significance level test, which indicates the growth of China's GDP can promote China's import and export trade with its trading partner countries.

(2) The distance between the two countries, like theoretical expectations, has a significant negative effect on exports and total trade. It indicates that the distance between the two countries representing transport costs is an important factor hindering the trade between China and the countries along the route.

(3)Based on their common boundary dispute handling problems, the two countries have common boundaries to a certain extent, can promote the potential of trade .

4. China's policy recommendations on trade with the countries along "the Belt and Road"

Since the strategy of "one belt and one road" has been put forward, China has actively promoted the construction of "one belt and one road", and all countries along the way have actively responded to the participation. Our country has taken many positive measures to further strengthen trade with countries along the line, and has achieved some results.According to some random variables adopted in this paper, we can give the corresponding practical countermeasures. Such as, optimizing China's import and export commodity structure to the countries along "the Belt and Road", pushing forward the free trade agreement between China and the countries, continuously improving the liner shipping connectivity in China, improving customs service and the efficiency of customs procedures in China, improving the Settlement of Border Disputes.

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