The empirical analysis of relationship between China's cross-border e-commerce & trade facilitation

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Abstract

This article presents a current situation of China's trade facilitation and cross-border e-commerce at first, and then makes some comparison between China and the other countries, based on the above analysis the paper makes an empirical test of relationship between China's trade facilitation and cross-border e-commerce. The results show that cross-border e-commerce can promote development of trade facilitation and play an important role in promoting total international trade volume of China. Finally, this paper puts forward suggestions about the development of cross-border e-commerce and trade facilitation.

Key words: *cross-border e-commerce; trade facilitation; gravity model*

1 The current situation of China's trade facilitation process
1.1 Achievement of China's trade facilitation

Enabling trade Index (ETI) in "Global Enabling Trade Report" (2015)[1, 2] that published by The World Economic Forum is able to measure the degree of national trade facilitation and easy for the comparison among countries. ETI constituted by four first-level indicators, namely, market access, border administration, transport infrastructure, and business environment, with the score from 1 to 7, the higher the score, the higher the degree of trade facilitation. The score comparison of the first-level indicators of China's trade facilitation during 2008 to 2014 can be seen in Fig. 1.

1.2 Contrast on the degree of facilitation between China and major trading countries

Enabling trade index of 138 countries was ranked in "2014 Global Enabling Trade Report", the specific information is shown in Table 1.
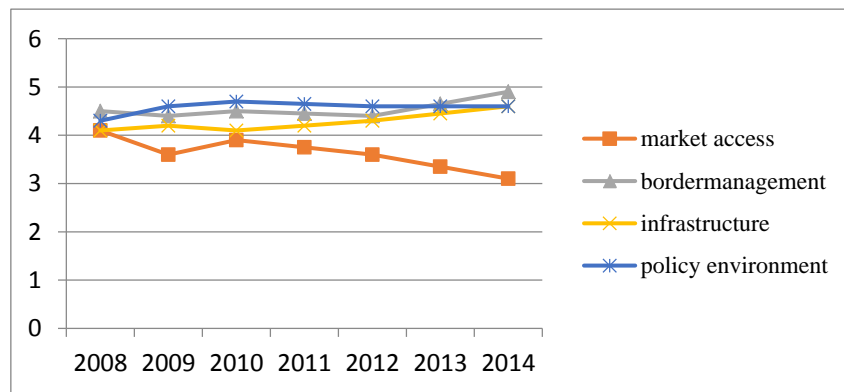
Fig. 1 - Contrast on the first-level indicator score of China's trade facilitation during 2008 to 2014

As can be seen from the data in Table 1, the score for China's enabling trade index is only 4.3 (0-7), while the score for Singapore is up to 5.9, Singapore ranks the first place in trade facilitation and is a country with the world's highest level of trade facilitation, followed by China's Hong Kong SAR, although it ranks the second place, there is a great gap between its score with Singapore.

Table 1 - Enabling Trade Index ETI of countries that have close trade relations with China

country	rank	score	Region	Income	Country	Rank	Score	Region	Income
Singapore	1	5.9	Developed country	Other high income	China	54	4.3	Developed country	Upper middle income
Hongkong	2	5.5	Developed country	Other high income	Thailand	57	4.2	Developing country	Upper middle income
U.K.	6	5.2	Developed country	OCED-High income	Indonesia	58	4.2	Developing country	Upper middle income
German	10	5.1	Developed country	OCED-High income	South Africa	59	4.2	Afirca	Upper middle income
Japan	13	5.1	Developed country	OCED-High income	Philippine	64	4.1	Developing country	Upper middle income
U.S.	15	5	Developed country	OCED-High income	Vietnam	72	4	Developing country	Upper middle income
Australia	23	4.9	Developed country	OCED-High income	Brazil	86	3.8	South America	Upper middle income
Taiwan	24	4.9	Developed country	Other high income	India	96	3.6	Developing country	Upper middle income
Malaysia	25	4.8	Developing country	Upper middle income	Laos	98	3.6	Developing country	Upper middle income
South Korea	30	4.7	Developed country	OCED-High income	Russia	105	3.5	Developing country	Lower income

2 Development of China's domestic cross-border e-commerce

At present, the current development of cross-border e-commerce is mainly characterized by the following three features:

2.1 Trade scale continues to grow, its proportion in the total import and export trade volume is increasing

In recent years, the trade volume of cross-border e-commerce in domestic has been rapidly growing, and its proportion in the total import and export trade volume is also increasing. From the statistics of the first half of 2015, it can be seen that the trade scale of cross-border e-commerce reached to 2 trillion Yuan in the first half of 2015 (January-June), accounting for 17.3% of total import and export value, and 15.89% of the total import and export trade volume(see Fig 2). According to Commerce Department, it is estimated that the trade volume of cross-border e-commerce in domestic in 2016 will grow from 0.8 trillion Yuan in 2008 to 6.5 trillion Yuan, accounting for 19% of the total foreign trade scale, with the average annual growth rate of 30%.As for the structure ratio of cross-border e-commerce businesses, in the first half of 2015, the export accounted for 84.8% in the import and export structure of China's cross-border e-commerce, and the import accounted for 15.2%(see Fig 3).
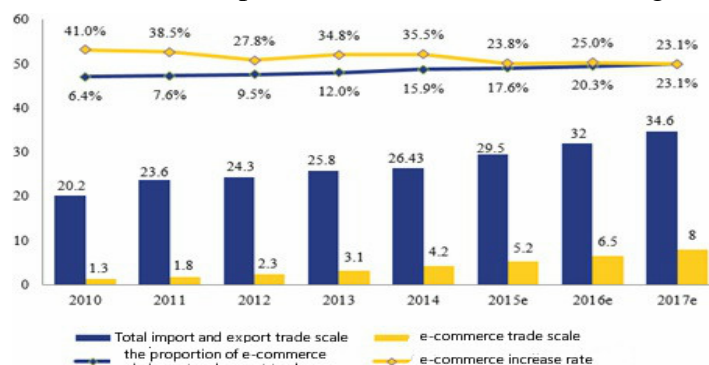

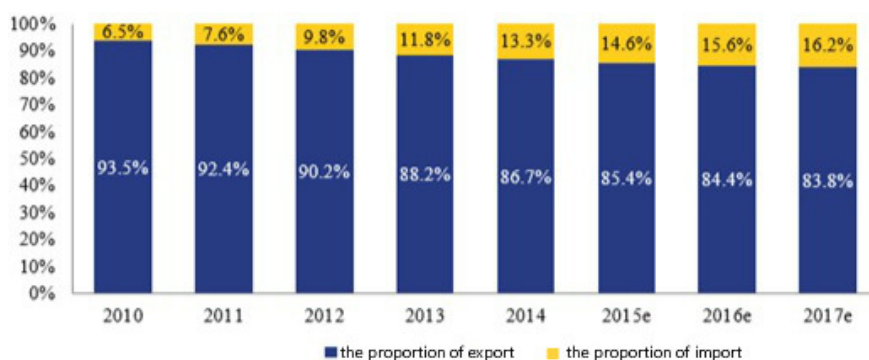*Fig. 2* - Trade volume of cross-border e-commerce in our country during 2010 – 2017

Fig. 3 - Import and export structure chart of China's cross-border e-commerce during 2010 - 2017

2.2 Cross-border e-commerce be supported by government & policy

As a new engine of foreign trade development, cross-border e-commerce has gained attention and support from the government. To be specifically, from the "national six-points package" in 2013 to "national eight-points package" in May 2015, China's central government had issued at least 16 supportive policies concerning cross-border e-commerce in 17 months. "National six-points package" was introduced at the end of August 2013, and the government firstly and officially declared to give policy support to cross-border e-commerce; besides, Shanghai, Chongqing, Hangzhou, Ningbo, Zhengzhou five cities were considered as pilot cities for cross-border business, in August the same year, Guangzhou was added as the sixth pilot city, and in July 2014, Shenzhen was approved to be the seventh pilot city.

In 2015, the State Council promulgated "Opinions on Accelerating the Development of E-commerce to Develop New Economic Dynamism", referred to as e-commerce "National eight-points package" that aimed to promote the development of e-commerce from eight aspects, and accelerate the cultivation of new economic dynamism, of which, cross-border e-commerce was required to be developed energetically in Article Six. In the same year, the State Council promulgated "Guiding Opinions on Promoting Cross-border E-commerce Healthily and Rapidly" that defined the main development objectives of cross-border e-commerce, and specially proposed to cultivate a number of cross-border e-commerce platforms and foreign trade integrated service enterprises. All of these are obvious dividend policy signs. It can be said that even if the tax bonus window of cross-border e-commerce will be closed gradually in the future, and the general business tax rate may be adjusted to normal level, the situation is quite favorable from the present point of view.

3 Empirical snalysis

3.1 Model set

Trade gravity model that used to explore trade facilitation and cross-border e-commerce can be seen as (Wang, 2015)[3],usually was set as following:

$$\ln Export_{ijt} = a_0 + a_1 lnict_{jt} + a_2 lnenvironment_{jt} + a_3 lnborder_{jt} + a_4 lninfrastructure_{jt} + t + \tag{1}$$
$$a_5 lnaccess_{jt} + a_6 lndistance_{ij} + \varepsilon_{ijt}$$

Wherein, $Export_{ijt}$ represents the exported volume of cross-border e-commerce business between the two countries, GDP_j represents the gross domestic product of trading partner country, which reflects the potential trade demand, with the expected sign to be positive; $distance_{ij}$ represents the distance between China and its trading partner country, the more

distant the two economies, the higher the transport costs, and cross-border e-commerce business will also be hindered. In view of the data non-availability, this paper can only use multiple linear regression to perform analysis. The general formula for the multivariate linear regression model is: $Y_t = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \cdots\cdots + \beta_k X_{kt} + \mu_t$, which refers to the impact of each changing unit X_k on Y under the condition of all other variables are constant. The first-level indicators of trade facilitation (including port efficiency, market access, infrastructure, business environment and e-commerce) are introduced as explanatory variables. In this paper, the exported country i is always China, by combining the structural formula of the above gravity model with structural features of panel data, a multiple linear regression equation that can reflect the impact of cross-border e-commerce on trade facilitation is obtained:

Wherein, α represents the correlation coefficient. The dependent variable $Export_{ijt}$ indicates the exported volume of my country to country j, and ict_{jt} represents cross-border e-commerce environment indicator; besides, as the business data of cross-border e-commerce in various countries are not complete, so the environmental indicator of cross-border e-commerce in various countries is used as a basis to judge its relationship with trade facilitation and total export volume.

3.2 Data source

China's major exported countries during 2008--2014 years were selected as objects of analysis in this paper, and the cross-sectional data and time series data of United States, South Korea, Japan, Australia, Russia and Brazil six countries during 2008--2014 years were regarded as empirical analysis objects to study the relationship between cross-border e-commerce business and export trade flows under trade facilitation environment. 5 first-level indicators of trade facilitation of trading partners were all selected from "Global Enabling Trade Report" that published by the World Economic Forum during 2008 to 2014.

3.3 Empirical analysis

Table 2 - Regression analysis results

Dependent Variable: LNEXPORT

Method: Least Squares

Date: 04/21/16   Time: 11:43

Sample: 1 42

Included observations: 42

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNICT	2.928644	0.967957	3.025591	0.0046
LNENVIRONMENT	0.442018	0.107164	4.124685	0.0002
LNBORDER	2.456101	1.135929	2.162196	0.0373
LNINFRASTRUCTU RE	1.984078	0.648484	3.059564	0.0042
LNDISTANCE	-4.537711	1.460553	-3.106845	0.0037
C	-1.377841	1.795980	-0.767181	0.4480

R-squared	0.740307	Mean dependent var		7.097486
Adjusted R-squared	0.704239	S.D. dependent var		0.997972
S.E. of regression	0.542737	Akaike info criterion		1.747178
Sum squared resid	10.60427	Schwarz criterion		1.995417
Log likelihood	-30.69074	Hannan-Quinn criter.		1.838167
F-statistic	20.52508	Durbin-Watson stat		0.865939
Prob(F-statistic)	0.000000			

Source: obtained from Eviews software calculation

This paper conducts multiple linear regression analysis based on panel data, the data used are panel data that constituted by time-series data and section data, and the heteroscedasticity problem is also substantially overcome by logarithmic transformation. After observing the $access_{jt}$ data, it found that the assessment methods toward $access_{jt}$ index in "Global Enabling trade Report" in 2008 and 2009 was different from the one that published in 2010 and after, so after deleting the explanatory variables, the result is shown in Table 2.

$$\ln Export_{ijt} = a_0 + a_1 lnict_{jt} + a_2 lnenvironment_{jt} + a_3 lnborder_{jt} + a_4 lninfrastructure_{jt} + a_5 lndistance_{ij} + \varepsilon_{ijt}$$

(3)

Overall, the fitting result of modified model is more desirable than that of bfeore, the coefficient signs of various explanatory variables are also in line with theoretical expectations, and corresponding regression coefficients of each independent variable all pass the test of significance to ensure the reliability of statistics. The results of regression model (4) follows:

$$\ln \text{Export}_{ijt} = -1.378 + 2.928 lnict_{jt} + 0.442 lnenvironment_{jt} + 2.456 ln\,border_{jt} +$$

$$1.984 ln\,infrastructure_{jt} - 4.538 lndistance_{ij}$$

4 Conclusions

The empirical results show that ict indicator of both sides has a significant role in promoting the business exports. Every 1% increase in ict index is linked to 2.928% contribution to business exports, indicating the stronger the country's ICT, the more it can enhance the level of trade facilitation, and promote the increase of trade export volume; border management has the second largest impact on trade facilitation and trade export volume, the regression coefficient of border management variable is 2.456, and has passed the significance test, indicating every 1% increase in the transparency and efficiency of customs clearance is linked to 2.456% increase in China's export volume; the regression coefficient of distance among trade countries is -4.538, indicating distance is the resistance factor for China's foreign trade development. It suggests that we should proceed trade with countries that are more close to our country, the truth is our top trade partners of Japan and Korea are quite close, and the total amount of import and export with the two countries continues to increase every year; regression coefficient of institutional environment is 0.442, indicating that every 1% increase in institutional environment is linked with 0.442% increase in export volume; transport and infrastructure also have a significant impact on trade exports, every 1% increase in infrastructure is linked with 1.984% increase in export amount.

In summary, the development of cross-border e-commerce plays a positive role in promoting international trade. Moreover, in the first-level indicators of trade facilitation, cross-border e-commerce has the largest impact on export volume, that is to say, every unit improvement of the cross-border e-commerce environment is linked with 2.93% increase in the total trade volume. Besides, due to the large boost of cross-border e-commerce, it should account for a large proportion in each indicator of trade facilitation. Therefore, the development of cross-border e-commerce also directly promotes the overall development of trade facilitation.

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