Empirical Study on Factors Influencing Development of China Cross-Border e-Commerce

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Abstract: As an emerging foreign trade model, cross-border e-commerce is global, instant, counter-cyclical and developing rapidly, which makes it the new engine for economic growth in the future China. Based on the existing research results and actual situations in China, nine factors from three aspects that probably affect the development of cross-border e-commerce in China are put forward, which involve the total amount of import and export, the actually utilized foreign direct investment, the throughput of international trade cargo in national ports, the Belt and Road Initiative, disposable income of urban residents per capita, inhabitant's consumption expenditure, Internet penetration rate, the added value of the service sector and the express quantity. With the verification by the multivariate regression method, the results show that the Belt and Road Initiative, express quantity and inhabitant's consumption expenditure are the most important factors. According to the empirical result, some suggestions are put forward to improve the cross-border e-commerce in China: promote the Belt and Road Initiative on a larger scale so as to push its further development; expand domestic demand and stimulate consumption; keep on developing cross-border logistics system.

1. Introduction

Cross-border e-commerce refers to an international business activity in which traditional transnational trade is conducted electronically. Merchants in different countries display goods, negotiate and transact via Internet, then commodities are delivered through cross-border logistics. In the 21st century, the cross-border e-commerce plays a vital role in China's continuous progress to open its market to the world. Via Internet, hundreds of millions of consumers can easily compare the price of goods, carry out online purchase, and share feedback after use with other consumers. For countries, international competitiveness is also measured by the penetration rate of the Internet, the development of logistics system, and even the maturity of cross-border e-commerce. Compared with traditional trade, cross-border e-commerce possesses higher revenue, wider range of choices for consumers, less cost for enterprises and higher logistics efficiency. These advantages will attract more enterprises and more consumers to use cross-border e-commerce in the future, which will further promote consumption, investment and foreign trade for China. Therefore, it is of great realistic significance to study the factors influencing the development of cross-border e-commerce in China.

Many scholars have looked into the cross-border e-commerce in recent years. Mahdi Choshin and Ali Ghaffari [1] found out that in small-sized and medium-sized e-commerce enterprises, customer satisfaction, cost, infrastructure, knowledge and information are the effective factors that build the success of an e-commerce enterprise. Yuanyuan Suo[2] divided the factors that affect cross-border e-commerce into policy factors, economic factors and special factors, and put forward corresponding suggestions. Meng Li [3] empirically studied the impact of international express quantity, direct employment of e-commerce, number of B2C and C2C cross-border e-commerce enterprises, and Internet penetration rate on the development of cross-border e-commerce in China.

However, current quantitative analyses lack comprehensive variables and necessary verification accordingly. Therefore, based on a comprehensive analysis, this paper puts forward nine factors that

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may affect the development of China's cross-border e-commerce from three aspects: the development of China's foreign trade, the domestic economy situation and the construction of domestic related infrastructure.

2. Data and Method

Based on the past research and the current situation, from the above three aspects, the following nine variables are proposed: the total amount of import and export, the actually utilized foreign direct investment, the throughput of international trade cargo in national ports, the Belt and Road Initiative, disposable income of urban residents per capita, inhabitant's consumption expenditure, the added value of the service sector, Internet penetration rate and the express quantity. The explanation of variables and the method are as follows.

2.1 Variables

2.1.1 Variables Reflecting the Construction of Domestic Related Infrastructure: the Internet Penetration Rate, the Express Quantity

The Internet penetration rate refers to the ratio of Internet users to the total resident population of a country. In the research of Meng Li and Weinian Zhang [4], the Internet penetration rate and the express quantity are significantly related to the turnover of cross-border e-commerce in China, so this paper also includes these two variables to reflect the construction of domestic related infrastructure. Logistics is also an significant factor. According to Jiao [5], the logistics system of e-commerce directly affects the transactions and customer experience. The optimization of the logistics network is conducive to the improvement of freight transportation. This paper uses the express quantity to measure the current situation of logistics infrastructure in China.

2.1.2. Variables Reflecting the Domestic Economy Situation

The Disposable Income of Urban Residents Per Capita, the Inhabitant's Consumption Expenditure, the Added Value of the Service Sector

According to the theory of supply and demand, the basis of cross-border e-commerce commodity sales is the demand of consumers. The disposable income of urban residents per capita and inhabitant's consumption expenditure directly affect the cross-border e-commerce sales, so this paper uses them to represent the domestic average consumption level. Meanwhile, the service sector has gradually become the pillar of the national economy. The development of the service sector can improve the efficiency of cross-border e-commerce, while the expansion of cross-border e-commerce transaction can attract more capital to invest in this industry. So this paper uses the added value of the service sector to measure the domestic industrial structure.

2.1.3. Variables Reflecting the Development of China's Foreign Trade

The Total Amount of Import and Export, the Actually Utilized Foreign Direct Investment, the Throughput of International Trade Cargo in National Ports, the Belt and Road Initiative

As for the development of China's foreign trade, this paper uses the total amount of import and export, the actually utilized foreign direct investment, the throughput of international trade cargo in national ports and the Belt and Road Initiative to evaluate. The Belt and Road Initiative is proposed as a quality variable. Referring to the method of previous research [4], time dummy variable is introduced here to quantify the time period . The period before 2013 and after 2013 applies different numbers.

2.2 Data

After determining the variables, this paper uses the turnover of the cross-border e-commerce in China from 2008 to 2018 as the explained variables. The data of the variables are mainly from the National Bureau of statistics of the people's Republic of China and the China E-commerce Research Center.

2.3 Method

This paper uses multivariate regression method to explore the factors influencing development of China cross-border e-commerce. The initial equation is as follows:

$$Y = \beta + \alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 X_3 + \alpha_4 X_4 + \alpha_5 X_5 + \alpha_6 X_6 + \alpha_7 X_7 + \alpha_8 X_8 + \alpha_9 X_9 + \varepsilon \quad (1)$$

In equation (1), explained variable Y represents the turnover of cross-border e-commerce in China. $X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9$ stand for disposable income of urban residents per capita, inhabitant's consumption expenditure, the express quantity, Internet penetration rate, the Belt and Road Initiative, the total amount of import and export, the added value of the service sector, the actually utilized foreign direct investment and the throughput of international trade cargo in national ports respectively. $\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5, \alpha_6, \alpha_7, \alpha_8, \alpha_9$ are parameters to be estimated, ε is the random error terms. Although initial regression shows that the equation has a high fit degree, the regression coefficients of some variables are negative, which does not accord with realistic economic phenomenon. Through the VIF test, the data suggests there is a serious multicollinearity between variables. Therefore, the stepwise regression method is used to eliminate the collinearity, and the revised optimal regression model is as follows:

$$Y = \beta + \gamma_2 \ln(X_2) + \gamma_3 X_3 + \gamma_5 X_5 + \varepsilon \quad (2)$$

In equation (2), explained variable Y represents the turnover of cross-border e-commerce in China. X_2, X_3, X_5 stand for inhabitant's consumption expenditure, the express quantity, and the Belt and Road Initiative respectively. $\gamma_2, \gamma_3, \gamma_5$ are parameters to be estimated, ε is the random error terms. The regression result is shown in Table 1 below.

Table 1 the Regression Result of Equation (2)

Variable (2)	Coefficient (2)	Std. Error (3)	t-Statistic (4)	Prob. (5)
β	-2.053077	0.266751	-7.6966	0.0001
X_3	0.012933	0.000288	44.84513	0.0000
$\ln(X_2)$	1.795328	0.154888	11.59116	0.0000
X_5	0.318149	0.09575	3.322701	0.0127

The regression equation is as follows:

$$Y = -2.053 + 1.795 \ln(X_2) + 0.013 X_3 + 0.318 X_5$$

Meanwhile, the variance inflation factor of the variables are shown in the table 2 below. In the column (4) of table 2, all centered VIF are less than 10, which indicates that the multicollinearity has been eliminated.

Table 2 the Variance Inflation Factor of the Variables

Variable (1)	Coefficient Variance (2)	Uncentered VIF (3)	Centered VIF (4)
β	0.071	131.234	NA
X_3	0.000	8.253	4.103
$\ln(X_2)$	0.024	178.617	4.354
X_5	0.009	7.686	4.192

2.4 Result

After eliminating the multicollinearity, inhabitant's consumption expenditure, the express quantity and the Belt and Road Initiative can explain 99.93% of the variance of the explained

variable. The result shows that the above three factors have a strong positive correlation with the growth of cross-border e-commerce in China. The reasons why above three factors exert such considerable impact are as follows.

First of all, in recent years, the income of residents has been increasing steadily and the level of social security has been improving. Inspired by the great momentum of the policy, the residents are boosting their spending. Consumption growth and consumption upgrade have become the two main directions of the market. This trend has gradually spread to the second- and third-tier cities from the first-tier city. Cross-border e-commerce brings fine products with good quality and low price, which just caters to the trend of consumption upgrade in the domestic market. Therefore, inhabitant's consumption expenditure significantly promotes the growth of cross-border e-commerce in China.

Secondly, the quantity of express reflects the level of logistics system in China. The improvement of logistics system will bring out more effective cross-border logistics and less damage to goods. On the one hand, better function of logistics system reduces the cost of enterprises and attracts more investment, on the other hand, it increases the welfare of consumers and brings more consumption. At last, it forms a virtuous circle for the cross-border e-commerce market. Therefore, it establishes a positive correlation between the express quantity and the turnout of cross-border e-commerce in China.

Finally, the Belt and Road Initiative meets the development needs of China and other countries along the routes. It serves the common interests of relevant parties and answer the call of our time for global cooperation. The demand of countries along the routes is rapidly growing. Under the correct guidance of the national policy, the stable financial markets and the government support brings vast opportunity for cross-border e-commerce. To sum up, the above three factors have greatly promoted the development of cross-border e-commerce in China.

3. Conclusion

Based on above results, this paper suggests following policies to further stimulate the cross-border e-commerce in China. Firstly, while opening the cross-border e-commerce market, the brands of Chinese enterprises need to be improved. China needs to continue to expand market access to deepen international economic cooperation in new negotiation topics and explore other international markets for product exports.

Secondly, as a significant influencing factor of cross-border e-commerce and the driving force of national economic growth, the country should adopt policies to expand domestic demand and stimulate consumption. Active fiscal policy and monetary policy can be implemented to expand credit scale and reduce preventive savings reasonably.

Thirdly, logistics is one of the most important links in the development of cross-border e-commerce. Transportation plays a decisive role in the bond and arteries of urban socio-economic development. China can use the Internet, big data, artificial intelligence, 5G and other advanced technical means to allocate resources efficiently. The construction of domestic transportation facilities can be strengthened to connect with overseas transportation arteries. New logistics hubs in crowded ports can be built to provide support for cross-border e-commerce.

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