The Impact and Empirical Analysis of the Development Level of E-commerce Industry on China's Export Trade

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Abstract. With its advantages of low cost and high efficiency, e-commerce is not only favored by ordinary consumers, but also effectively promotes SMEs to find business opportunities and win the market. This article starts with the development scale of China's e-commerce industry and the status quo of export trade, and measures the overall index of China's e-commerce industry development level from 2008 to 2018 through empirical methods to analyze its impact on China's export trade. The results show that the development level of the e-commerce industry has a significant positive impact on China's export trade. Finally, it analyzes the existing problems in the development of China's e-commerce industry.

1 Analysis of the status quo and impact of China's e-commerce industry export trade

1.1 Development status of China's e-commerce industry

Online retail sales amounted to According to data from the National Bureau of Statistics[1], the transaction volume of China's e-commerce industry in 2018 was 31.63 trillion yuan (the blue bar in Figure 1, the unit is trillion yuan), an increase of 8.5% year-on-year the orange9.01 trillion yuan, a year-on-year increase of 23.9%, as shown in the data in Figure 1.

Data source: E-Commerce Research Center

Fig1. Transaction scale of China's e-commerce industry market from 2009 to 2018

In 2018, China's IPv6 addresses were 41,079 blocks/32, with an annual growth rate of 75.3%. There were 21,243,478 CN domain names with an annual growth rate of 1.9%. International export broadband was 8,946,570 Mbps, with an annual growth rate of 22.2%. It shows that China's network resources are growing rapidly, and the infrastructure of China's e-commerce industry is improving day by day, and the entire industry continues to develop[2]. The number of Chinese websites and webpages increased rapidly from 2010 to 2017. As of the end of 2018, the number of Chinese websites was 5.23 million (the blue bar in Figure 2 with 10,000 units), and the number of webpages was 281.6 billion (Figure 2 Histogram in middle orange color, 100 million units), as shown in the data in Figure 2.

Fig2. Number of Chinese websites and webpages in 2008-2018

Data source: "The 43rd Statistical Report on Internet Development in China"

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1.3 China’s e-commerce industry human capital investment status

![Fig3. Number of employees in e-commerce in 2009-2018](image)

Data source: China Business Research Institute

The accelerating integration of China’s e-commerce industry and the real economy has driven more people to engage in e-commerce related work. As shown in the data in Figure 3: Not only are direct employees growing (blue histogram in Figure 3, 10,000 people), but indirect employees are also increasing (orange histogram in Figure 3, 10,000 people). According to estimates by the China Internet Economics Research Institute of Central University of Finance and Economics, China's e-commerce industry employed 47 million people in 2018, an increase of 10.6% year-on-year. The number of Chinese netizens has been rising as shown in Figure 4, increasing from 210 million in 2007 to 821 million in 2018 (blue bar in Figure 4, 100 million people). The ratio increased from 24% in 2007 to 99.1% in June 2019, indicating that mobile payment penetrates all areas of life, and people only need to carry a mobile phone to meet their needs when they go out. Therefore, the increase in the number of Internet users has promoted the development of e-commerce in Lao to a certain extent.

1.4 China’s e-commerce industry development potential

![Fig5. China's Internet penetration rate from 2007 to 2018](image)

Data source: "The 44th Statistical Report on Internet Development in China"

The popularity of the Internet is a necessary condition for the rapid development of e-commerce. "Internet +" has become the mainstream trend of economic development in the future. Artificial intelligence, big data, 5G and other cutting-edge science and technology are highly integrated with the real economy, and will surely produce economic development. New kinetic energy. As can be seen from Figure 5, China's Internet penetration rate has been increasing, and it has reached 59.6% by 2018, an increase of 3.8% from 2017.

With the popularization of Internet shopping online, the scale of online shopping users in China has been continuously increasing from 2007 to 2018, with an average annual compound growth rate of 17%, which is a very rapid growth. In 2018, China’s online users reached 610 million (the blue bar chart in Figure 6, Unit 100 million people), as shown in the data in Figure 6 below. The scale of online shopping users is one of the important factors to measure the potential of e-commerce development. Therefore, it can be said that the development potential of China's e-commerce industry is great, and the level of transactions is also gradually improving.

2 Impact of e-commerce industry on export trade

2.1 Impact of e-commerce transaction level

The participation of e-commerce in international trade can reduce transaction costs, increase the types of traded goods, and give play to the competitive advantages of SMEs, thereby increasing the transaction volume of e-commerce enterprises and increasing the number of online shoppers, further promoting the level of e-commerce transactions and ultimately affecting China's export trade amount.

2.2 Impact of e-commerce infrastructure

Electronic data exchange is a data exchange tool widely used in the world. It can standardize the company's daily economic information data according to the agreement and transmit it back and forth. Only standardized and standardized logistics services can improve the efficiency of e-commerce transactions, increase consumer satisfaction, and help increase the sales profits of e-commerce companies, thereby promoting the growth of export trade.
2.3 E-commerce Human Resources Impact

The vigorous development of e-commerce will inevitably increase the market's demand for high-end talents such as e-commerce and international trade. International trade competition will force companies to improve the overall level of human resources and optimize local talent resources through corporate training and other means. The government effectively improve the level of human capital, promote the improvement of labor efficiency, and finally optimize the operating environment of e-commerce companies, enhance their international competitiveness, and ultimately expand export trade.

2.4 Impact of e-commerce development potential

E-commerce has promoted the formation of a virtual trading market, allowing commodity transaction information to fully flow around the world, transaction information is more open, transparent, and time-sensitive, thereby reducing the asymmetry of transaction information between buyers and sellers, and avoiding the incomplete impact of transaction information on transactions the interests of both parties.

3 An Empirical Analysis of the Development Level of Electronic Commerce Industry on China's Export Trade

3.1 Model building and data description

| Variable | Meaning |
|----------|---------|
| EX       | China's export trade scale |
| ECDI     | e-commerce industry development level |
| REER     | Renminbi effective real exchange rate |

3.2 Related analysis

This article first analyzes each factor and total export trade, and the relevant analysis results are shown in Table 3.

3.3 Unit root test

According to the relevant test results, the correlation coefficient between the development level of the e-commerce industry and the total export trade is 0.8898, which has passed the significance test at the 1% significance level, indicating that there is a positive correlation between the development level of the e-commerce industry and the total export trade.
The author further tests the stability of each variable. This article will use the more common ADF test method to test the stability of each variable. The test results are shown in Table 4 below.

### 3.4 Cointegration test

It can be seen from the unit root test results that each variable is a stationary sequence of the same order. For this reason, the author further carries out the co-integration test and uses the Johansen co-integration test. The results of the cointegration test are shown in Table 5.

From the trace test and the maximum eigenvalue test results as shown in Table 6, the significance level of the total export trade and the e-commerce industry development level is less than 0.05, and the co-integration test is passed, indicating that the total export trade. There is a co-integration relationship with the development level of the e-commerce industry and the real effective exchange rate of RMB. To this end, OLS regression is further performed and the regression equation is obtained as follows. The regression equation can be obtained from the regression coefficient results in Table 7.

\[
\begin{align*}
\text{LNEX} & \quad -0.814997 \quad -4.297073 \quad -3.212696 \quad -2.747676 \quad 0.7695 \\
D(LNEX) & \quad -5.161069 \quad -4.420595 \quad -3.259808 \quad -2.771129 \quad 0.0039 \\
LNECDI & \quad -1.756745 \quad -4.297073 \quad -3.212696 \quad -2.747676 \quad 0.3773 \\
D(LNECDI) & \quad -2.947260 \quad -4.420595 \quad -3.259808 \quad -2.771129 \quad 0.0778 \\
LNREER & \quad -0.901685 \quad -4.297073 \quad -3.212696 \quad -2.747676 \quad 0.7424 \\
D(LNREER) & \quad -2.336729 \quad -2.847250 \quad -1.988198 \quad -1.600140 \quad 0.0260 \\
\end{align*}
\]

The model fitting degree is 0.989582, and the adjusted fitting degree is 0.986978, indicating that the model fitting degree is high, and the development level of e-commerce industry and the actual effective exchange rate of RMB have a high degree of explanation for the total export trade. The significance of F test is 0. Passing the F test shows that the regression results of the model are reliable.

The regression coefficient of the e-commerce industry development level at the 1% significance level is 0.208505, indicating that there is a significant positive correlation between the e-commerce industry development level and the total export trade. That is, for every positive percentage change in the development level of the e-commerce industry, the total export trade will also change positively by 0.208505 percentage points. The improvement of the development level of the e-commerce industry has played a positive role in promoting the total export trade.

The regression coefficient of the actual effective exchange rate of RMB at the 1% significance level is 0.824311, indicating that the effective exchange rate of RMB is significantly positively related to the total export trade. That is, for every positive change in the real effective exchange rate of RMB, the total export trade also changes positively by 0.824311 percentage points. The real effective exchange rate of RMB has a positive effect on the total export trade.

### 4 Conclusions

This article measures the development level of China's e-commerce industry from 2008 to 2018 by establishing a comprehensive and scientific e-commerce index system. The measurement results show that the development level of China's e-commerce industry from 2008 to 2018 has increased year by year and developed at a faster rate. However, the development of China's e-commerce industry is still not perfect, facing various problems, and there is still much room for improvement. The empirical results also show that increasing the level of e-commerce industry will have a positive impact on China's export trade. When regressing on the overall e-commerce index, it was found to be significant at a 1% significance level, indicating that the e-commerce industry development level has a positive impact on China's export trade.
trade. It can be seen from the empirical regression results of the extended model in this paper that e-commerce has become an important factor affecting China's export trade, and the improvement of its development level is conducive to increasing China's total export trade, thereby driving China's economic growth. However, due to the current limitations of China’s capital and technology, the focus of different reforms on e-commerce is also different. As can be seen from the regression results of e-commerce sub-indicators, different first-level indicators have different impacts on China’s export trade[6]. Therefore, we should first reform the indicators with greater impact, increase capital investment, and better promote the development of China's import and export trade.

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