Study of the Impact of the Cross-border E-commerce Model Based on the Belt and Road on China's International Trade System

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Abstract

The Belt and Road is the general term of Silk Road Economic Belt and the 21st-century Maritime Silk Road proposed by General Secretary Xi Jinping on the Boao Forum for Asia in 2015. It refers to build the regional depth cooperation platform, carry out economic cooperation with countries along the Belt and Road and thus create an interest community covering economy, culture, politics, responsibility and others among cooperative countries by view of China’s inherent bilateral or multilateral mechanisms with neighboring countries, relying on the Silk Road in ancient times and taking the peaceful common development as the core. The Belt and Road has been quickly adopted as the important strategic direction of China upon being proposed. With huge annual trade volume, it plays an important role in promoting the economic development of China and has been a new growth point of China's economy. Therefore, the paper studies the cross-border e-commerce under the context of the Belt and Road in an in-depth manner, analyzes the formation mechanism of cross-border e-commerce market, illustrates the positive and negative impact of cross-border e-commerce on the international trading system and plays an important role in promoting the development of cross-border e-commerce.

Keywords: Cross-Border E-Commerce, International Trade, The Belt and Road.

1. REVIEW OF STUDY

1.1 Background

With the high development of information technology, the penetration of the Internet rises continuously. Featured with a large amount of information, rapid transmission, lower use threshold and highly interaction, the Internet plays an important role in promoting the development of traditional fields. China has paid enough attention to the advantages of the Internet, and Premier Li Keqiang formally put forward the "Internet +" strategy at the twelfth National People's Congress, which has played a crucial impact on the development of e-commerce. At present, e-commerce has become the focus of the work of all levels of government. Its coverage is increasingly widespread, and the e-commerce has been not only deeply integrated with the major cities, but greatly promoted in rural areas. Along with the continuous development of mobile information technology, mobile terminal shopping shows an explosive growth, a variety of electronic commerce modes are leading the traditional enterprises to be Internet-oriented, and e-commerce system tends to be more mature and has become the main trend of economic development in China.

1.2 Literature review

Under the background of the Belt and Road, the cross-border e-commerce has produced a profound impact on China's international trade system. On the one hand, the cross border e-commerce has subverted the traditional mode of foreign trade operation with closer international communication and more diversified payment mode, and the logistics mode is also undergoing high-speed changes and development. At the same time, cross-border e-commerce also reconstructed the industrial chain of China's foreign trade, established a perfect industry standard, realized the scale effect of enterprises, and brought new vitality to the development of enterprises. On the other hand, cross-border e-commerce has also brought some adverse effects on China's international trade. First of all, the legal protection of intellectual property rights is not perfect, so it’s easy to result in infringement and disputes of intellectual property rights, which are difficult to deal with. Secondly, the credit mechanism of
cross-border e-commerce is not perfect, there are loopholes in the evaluation mechanism, and the cross-border payment can involve security problems. Thirdly, the cooperation between countries is not deep enough, and there are still some problems in cross-border trade goods clearance. Finally, there is a shortage of human resources in the development of cross-border e-commerce (Chen, 2016). E-commerce can effectively promote the development of small commodity enterprises in China, and can optimize the market structure of China, and promote the transformation and upgrading of the market, and also the main direction of the development of traditional enterprises. In order to promote the development of cross-border e-commerce, the most important task is to build a good environment for cross-border e-commerce, so that more e-commerce enterprises can join the cross-border e-commerce (Liu, 2016). To solve the problems in cross-border e-commerce, we can start from the following aspects: firstly, we should pay more attention to enhance the added value of goods and sell goods with high value. Secondly, we should improve the construction of cross-border logistics. Thirdly, we should strengthen the cross-border e-commerce supervision mechanism and build a sound environment for cross-border e-commerce. Finally, we should focus on developing our own third-party payment platforms and relevant legal mechanisms to ensure secure cross-border payments (Feng, 2016).

2. FORMATION MECHANISM OF CROSS-BORDER E-COMMERCE MARKET BASED ON THE BELT AND THE ROAD

2.1 Basic assumptions

Assuming that in an international trading environment, there are three main entities, namely buyers, sellers and intermediaries, which together constitute a complete cross-border e-commerce market, without involving other aspects and influencing factors and we focus on the study of trading process of three main entities (Xiang, 2016), where the total sales of the seller is $T_x$, the total purchase amount is $T_y$, the domestic trade is $X$, and the foreign trade is $Y$. For the goods $X$, $x$ represents the consumption of goods and $X^d$ represents the sales of goods, while $X^s$ represents the purchase amount of goods. For the goods $Y$, $y$ represents the consumption of goods, $y^s$ represents the sales of goods, while $y^d$ represents the purchase amount of goods. According to the above content, we can see that in cross-border e-commerce trade, the transaction efficiency is $K_xX^d$ or $K_yY^d$. In the course of the transaction, intermediaries take charge of goods turnover and service function, $r$ represents the dual-purpose of the service. $r^d$ represents supply and $r^s$ represents demands. Labor productivity coefficient of buyers, sellers and intermediaries is respectively represents by $\alpha, \beta, \eta$(Zhu and Zhu,2016). Assuming that when cross-border e-commerce enterprises use the e-commerce platform, the resulting cost is $1 - R(R \in [0,1])$ while the efficiency of the platform is $R = 1 - np(p \in [0,1])$, where $P$ is the cost coefficient of the enterprise. In international trade, buyers and sellers inevitably produce certain preferences for goods (Li,2015). Assuming that the preference coefficients for X and Y are both 1/2, and the labor endowment value for each individual is 1, the time consumed for each individual product $X$ and $Y$ is $L_{ix}$ and $L_{iy}$ respectively, where $(i=1,2)$ $(i=1,2)$ and $L_{ix}+L_{iy}=1$, then it can also be concluded that in the process of cross-border e-commerce, the economic benefit of the seller:

$$U = (x + Rk_xr^dx^d)^{1/2}(y + Rk_yr^dy^d)^{1/2}$$  \hspace{1cm} (1)

Suppose that the production functions of commodity $X$ and $Y$:

$$x^p = x + x^d = \alpha L_x$$
$$y^p = y + y^d = \beta L_y$$
$$r^p = r + r^s = \eta L_r$$

Where, personal labor endowment of every commodity:$L_x + L_y + L_r = 1, L_x, L_y, L_r \in [0,1]$

Assuming the prices of goods $X$ and $Y$ are respectively represented by $P_x$, $P_y$ while $P_t$ represents the service provided by intermediaries, then the budget of cross-border e-commerce: $P_x(x^d - x^s) + P_y(y^d - y^s) + P_t(r^d - r^s) = 0$.

2.2 Optimal decision-making of individuals in cross-border trade

2.2.1 Self-sufficiency model

Under this division of labor, both sides of international trade will face certain choices, in which the question that the seller should choose is as follows (Chu,2016):
Max: \( U_1(A) = (xy)^\frac{1}{2} \)

\[ S.T. \ x = aL_x \]
\[ y = \beta L_x \]
\[ L_x + L_y = 1 \] (2)

After deduction, it can be concluded that the seller's utility:
\[ U_1(B) = U_1(A) = \frac{1}{2} (a\beta)^{1/2} \]

2.2.2 Direct trade model

In the cross-border e-commerce trade, intermediaries play an important role in connecting as both buyers and sellers of the goods. In this mode, both the seller and the buyer only need to take charge of domestic trade, and the intermediary shall take charge of foreign trade, which greatly reduces the pressure of cross-border e-commerce enterprise in foreign trade (Liu, 2016). Therefore, the seller's decision-making can be expressed by the following formula:

Max: \( U_3(A) = (xRk_yr^d y^d)^{1/2} \)

\[ S.T + x^s = aL_x \]
\[ L_x = 1_y \]
\[ P_x x^s = P_y y^d + P_r r^d \] (3)

After deduction, it can be concluded that the buyer's utility:
\[ y^d = \frac{aP_x}{3P_y}, r^d = \frac{aP_r}{3P_r}, x^d = \frac{a}{3}, x^s = \frac{2}{3}a \]
\[ U_3(A) = \left[ \left( \frac{a}{3} \right)^3 \frac{Rk_y P_p}{P_r P_y} \right]^{1/2} \] (4)

In the process, environment for the cross-border e-commerce enterprises is relatively complex, the cross-border e-commerce enterprises serve as both sellers and buyers, and some of their decisions won't exert impact, namely 0, the expression for their decision:

Max: \( U_3(B) = (RKx y^d y)^{1/2} \)

\[ S. Ty + y^s = \beta L_y \]
\[ L_y = 1 \]
\[ P_y y^s = P_x x^d + P_r r^d \] (5)

After deduction, it can be concluded,
\[ r^d = \frac{\beta P_y}{3P_r}, y^s = \frac{2\beta}{3}, y = \frac{\beta}{3}, x^d = \frac{\beta P_y}{3P_x} \]
\[ U_3(B) = \left[ \left( \frac{\beta}{3} \right)^3 \frac{Rk_y P_p^2}{P_r P_y} \right]^{1/2} \] (6)
In the same trade scope, the total utility is balanced, namely, \(U_3(A)=U_3(B)=U_3(C)\), while the market clearing conditions:

\[
M_x x^s = M_x x^d + M_y y^d, M_y y^s = M_x y^d + M_y y^d
\]  

(7)

The two any conditions of market clearing conditions are combined with utility equilibrium formula, it can be obtained:

\[
\frac{P_x}{P_y} = \frac{\beta k_x}{\alpha k_y} \left(\frac{4}{R^2 k_y}\right)^{1/3}, \quad \frac{P_y}{P_x} = \frac{\beta}{3} \left(\frac{4}{R^2 k_x}\right)^{1/3}
\]

\[
k_y = \left(\frac{M_x}{M_y}\right)^3, \quad U_3 = \left(\frac{2^9}{3^3} \frac{M_x M_y}{k_x k_y}\right)^{2/3} (k_x k_y)^{1/3}
\]  

(8)

The above content, in combination with the basic theory of economics, can reflect the formation mechanism and optimization measures of cross-border e-commerce trade market (Liu, 2016).

3. POSITIVE INFLUENCE OF CROSS-BORDER E-COMMERCE ON CHINA'S INTERNATIONAL TRADE SYSTEM—CASE OF ALIEXPRESS

3.1 Operation mode of AliExpress

Alibaba group is China’s largest e-commerce enterprise in China, and its seven affiliated business groups respectively bear different responsibilities in the field of electronic commerce, where the Ali International business is mainly engaged in international trade market, with such projects as AliExpress and One-touch (Zhou, 2017). AliExpress is a platform established to solve the limitation of traditional foreign trade development and promote the development of foreign trade of small and medium enterprises after the financial crisis, deeply integrating the orders, payment, logistics and other aspects of foreign trade with the operation mode shown in Figure 1:

![Figure 1. AliExpress Operation Mode](image)

From the above figure, the operation mode of AliExpress has some similarities with the Taobao mall in China, but also has its particularity. At present, China has more than 40 million of small and medium enterprises, of which 80% don’t have independent brands, and many famous domestic brands have no influence in foreign countries,
which has brought some difficulties to the cross-border e-commerce. AliExpress platform may help domestic enterprises establish brand image in overseas sales, and domestic products sell to foreign consumers at more preferential prices to help, reflecting such characteristics of our products as high quality and inexpensive price and significantly promoting the establishment of China's enterprise brand image (Shi, 2014).

3.2 AliExpress’ innovation on traditional cross border e-commerce mode

3.2.1 Constructing communication channels at home and abroad

In the traditional cross-border e-commerce mode, there will be many links between the two sides of the transaction, which will not only produce expensive cost, but also lead to communication difficulties between the two sides in the transaction. While in AliExpress, consumers can check the relevant products by directly logging in the platform with computers and mobile phones, as well as check product sales, information, user evaluation so as to make foreign consumers have a clear understanding of commodity information. In addition, the seller can also master the consumers’ search and purchase habits so as to understand consumers' shopping psychology, and purposefully provide the goods and services. AliExpress platform is also provided with the communication software the same function of Ali Wangwang, and such software has a unique function of translation, which can achieve real-time communication between businesses and consumers, broaden the cross-border communication channels, and thus lays a solid foundation for the development of cross-border e-commerce (Chen, 2015).

3.2.2 Providing a new payment method

In order to guarantee the capital security of consumers and businesses in cross-border e-commerce, AliExpress have cooperated with Alipay in an in-depth way to develop a third-party payment platform, which has become the first choice for shopping on AliExpress platform. In this process, the money that consumers spend to buy goods will be stored in a third party platform after the consumers receive and confirm goods, the money will be transferred to the businesses, which effectively guarantees transaction security of the cross-border e-commerce and also solve such issues of traditional cross-border e-commerce as cumbersome procedures, longer period of payment and lower efficiency (Li, 2017).

3.2.3 Building a sound logistics system

Logistics factor is the most important factor that restricts the development of cross-border e-commerce. In the traditional cross-border e-commerce, the construction level of logistics system is low, which will result in a large number of intermediate links, a higher cost of transportation, lower logistics efficiency, easy to cause damage to the goods and others. AliExpress has established an in-depth cooperation with a number of domestic and foreign logistics enterprises and developed a diversified logistics system, greatly easing the problems arising from traditional logistics (Zhao, 2017). Its main collaborative logistics is shown in Table 1:

### Table 1 Collaborative logistics model

<table>
<thead>
<tr>
<th>Express name</th>
<th>Carrier</th>
<th>Main line</th>
<th>Delivery</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postal package</td>
<td>China Post, Hongkong post</td>
<td>Hongkong, Macao and Taiwan</td>
<td>Freight forwarding</td>
<td>Cheap, slow, packet loss</td>
</tr>
<tr>
<td>EMS on line delivery</td>
<td>Zhejiang post</td>
<td>Europe, America, Asia, Australia</td>
<td>Online delivery, freight forwarding</td>
<td>High cost performance, suitable for retail</td>
</tr>
<tr>
<td>International E Po</td>
<td>China Post</td>
<td>America</td>
<td>Online delivery, freight forwarding</td>
<td>High speed, high price and good service</td>
</tr>
<tr>
<td>DHL Express online delivery</td>
<td>Sinotrans - DHL</td>
<td>Europe, America, Asia, Australia</td>
<td>Online delivery, freight forwarding</td>
<td>High speed, high price and good service</td>
</tr>
<tr>
<td>UPS online delivery</td>
<td>UPS</td>
<td>North America, Australia</td>
<td>Online delivery, freight forwarding</td>
<td>High speed, high price and good service</td>
</tr>
<tr>
<td>TNT on line delivery</td>
<td>TNT</td>
<td>Europe</td>
<td>Online delivery, freight forwarding</td>
<td>High speed, high price and good service</td>
</tr>
<tr>
<td>FedEx on line delivery</td>
<td>FedEx</td>
<td>America, East Asia</td>
<td>Online delivery, freight forwarding</td>
<td>High speed, high price and good service</td>
</tr>
</tbody>
</table>

Analysis chart shows that AliExpress has a variety of collaborative logistics models, and each logistics model has its advantages and disadvantages. When choosing the logistics mode, the businesses can take a
4. NEGATIVE IMPACT OF CROSS-BORDER E-COMMERCE ON CHINA'S INTERNATIONAL TRADE

4.1 Prone to intellectual property disputes

Intellectual property issue is one of the most common problems in modern trade and various problems related to intellectual property infringement frequent occur in cross-border e-commerce. In essence, cross border e-commerce and intellectual property rights themselves are in opposition. On the one hand, cross-border e-commerce providers pay more attention to the disclosure of information and environment and promote the development of cross-border e-commerce with good trading environment. On the other hand, intellectual property rights is more relevant to the confidentiality and exclusivity of information, with strict control over the spread of information, which makes the process of cross-border e-commerce inevitably produce intellectual property disputes, which are difficult to solve. In the cross-border e-commerce, although most of cross-border trading platform have explicitly banned the sale of counterfeit products, there are still many high imitation or fake products in reality, which has exposed the weak consciousness of intellectual property rights of Chinese enterprises and has a great impact on the image of Chinese products.

4.2 Credit security

The market environment facing cross-border e-commerce is far more complex than domestic e-commerce with some risks. In the process of cross-border e-commerce, credit security is an important issue that restricts the development of cross-border e-commerce. First of all, in terms of payment, although there are various third-party platforms, there is still a lack of a clear standard in general, and it’s more likely to have false users. At the same time, in cross-border transactions, it’s possible to use the anonymous trading method, which produces a greater impact on the supervision of the transaction information. Second, it’s the issue of payment security. Because the Internet itself has the characteristics of virtualization, cross-border e-commerce relies on the existence of the Internet and necessarily have the characteristics of virtualization, which also leads to cross-border trade to bear a certain risk. In addition, due to the impact of viruses, hackers and other factors, the information leakage problems are numerous, which has brought great impact on the development of cross-border e-commerce (Zhu, 2016).

4.3 Customs clearance

Currently, there are three main customs clearance modes for goods in cross-border e-commerce, as shown in Figure 2:

<table>
<thead>
<tr>
<th>mode</th>
<th>Express customs clearance</th>
<th>Cargo collection customs clearance</th>
<th>Make customs clearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characteristic</td>
<td>International express direct mail</td>
<td>Uniform packing and customs clearance</td>
<td>Prepare the goods and send the goods after order</td>
</tr>
<tr>
<td>Advantage</td>
<td>No need to stock up in advance</td>
<td>No stock in advance, high efficiency and low cost</td>
<td>The lowest cost, the highest efficiency</td>
</tr>
<tr>
<td>shortcoming</td>
<td>The express mail is confusing, inefficient and costly</td>
<td>Seller cost high, long delivery cycle</td>
<td>Warehousing cost</td>
</tr>
<tr>
<td>Applicable conditions</td>
<td>A small amount of business</td>
<td>Large volume of business</td>
<td>The business is large and stable</td>
</tr>
</tbody>
</table>

Analysis chart shows that cross-border e-commerce goods mainly have three customs clearance modes. First of all, express customs clearance, that’s, goods shall be sent directly through international express mail, and this method doesn’t need to stock, but is easy to produce confusion, with lower efficiency and higher cost. This method is suitable for fewer and unstable orders. The second is collecting goods for customs clearance, that’s, accumulating some goods to a certain extent for the unified customs clearance, this approach doesn’t require the...
stock with higher customs clearance efficiency, low cost, and a longer delivery period because of overseas package with certain cost. Therefore, it’s mainly used for the cases with a large quantity of orders. The last is to stock up for customs clearance, which is to establish a storage warehouse, stock up a certain amount of goods, and directly carry out customs clearance once there are orders. This approach has a low cost and high customs clearance efficiency. But because of the need for early stocking, it’s necessary to establish or lease a warehouse, which will produce a certain cost. This method is mainly applicable to large and stable business conditions. These three methods will have some problems, which will also produce expensive costs and are not conducive to the development of cross-border trade (Wu, 2017).

ACKNOWLEDGMENTS

Project Source: The Humanities and Social Sciences Research Project of Colleges and Universities in Hebei province—Youth recruitment projects, Project name: Trade Potential and Influencing Factors in Hebei Province at the Background of Docking Beijing-Tianjin-Hebei Coordinated Development and the Strategy of "the Belt and Road Initiatives "—Based on Empirical Studies of Stochastic Frontier Gravity Model, Project number: BJ2016069. Project Source: Research on Social Science Development in Hebei Province, Project name: Research on Agricultural Trade Flow and Trade Potential in Hebei Province, Project number: 201603020217

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