

The Impact of Trade Facilitation on China's Provincial Cross-border E-commerce Operational Performance under the "Dual Circulation" Development Pattern

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Abstract: Based on the provincial perspective, this paper constructs and calculates China's provincial Trade Facilitation Index and cross-border e-commerce operation performance index, and further investigates the impact of China's provincial trade facilitation on the improvement of cross-border e-commerce operation performance (quality) and its regional differences. The study found that the Trade Facilitation Index has a significant positive enabling effect on the performance improvement of cross-border e-commerce in China, but the impact of the Trade Facilitation Index on the performance improvement of cross-border e-commerce in different regions of China has significant regional differences. The higher level of Trade Facilitation Index in the eastern region makes the operation performance of cross-border e-commerce higher, followed by the central region, and the western region is the weakest, which is characterized by the regional distribution of "the stronger the stronger, the weaker the weaker". At the same time, the operation performance of cross-border e-commerce is closely related to the level of foreign direct investment, the degree of regional opening to the outside world, whether there are pilot cities for cross-border e-commerce comprehensive pilot zones, and the number of government policies to support the development of cross-border e-commerce. From the perspective of performance, a stronger level of foreign investment, a higher level of openness, a more intensive cross-border e-commerce pilot zone and more policy support for cross-border e-commerce development will achieve a higher level of cross-border e-commerce operation performance. Finally, the paper puts forward relevant policy suggestions on how to improve the level of trade facilitation and help improve the level of cross-border e-commerce operation in China from the four dimensions of the construction of the Trade Facilitation Index.

Keywords: Trade facilitation, Cross border e-commerce, Operational performance, Dual circulation.

1. Introduction

The strategy of "taking the major domestic cycle as the main body and developing the international and domestic cycles together" as emphasized in the "Proposal of the CPC Central Committee on the 14th Five-Year Plan for National Economic and Social Development and the 2035 Vision" adopted at the Fifth Plenary Session of the 19th CPC Central Committee has shown that China's economic development in the 14th Five-Year Plan period should not only play the role of internal consumption. In the 14th Five-Year Plan period, China's economic development should not only play the role of internal consumption cycle, but also play a good role of international external circulation. The new development pattern of the dual circulation requires cross-border e-commerce to play the role of integration and smooth flow: on the one hand, cross-border e-commerce takes industrial integration as the focus to promote the quality and efficiency of the domestic cycle. On the other hand, cross-border e-commerce will innovate the global industrial division of labor and collaboration, and promote the smooth flow of domestic and international dual circulation. The domestic industry belt and manufacturing base will be based on cross-border e-commerce, deeply participate in the global market and cultivate new competitive advantages in foreign trade. 2020, the new crown pneumonia outbreak brought a huge impact on the global economy, and China's export trade faced serious challenges. As an emerging trade mode, cross-border e-commerce with its online, multilateral, localized, non-contact delivery, short transaction chain and other advantages, showing rapid growth, for foreign trade enterprises to cope

with the impact of the epidemic played an active role, becoming an important force to stabilize foreign trade, pulling the "dual circulation" of the new pattern of the key link.

In order to help the development of cross-border e-commerce, through the "Internet + foreign trade" to promote the quality of China's cross-border trade, the Chinese government has launched a series of favorable policies. Approval of the establishment of cross-border e-commerce pilot cities, from the national strategic level to rational planning of the development of cross-border e-commerce route; vote to pass the "Electronic Commerce Law", to provide legal protection for the development of cross-border e-commerce. As of 2020, China has approved the establishment of 15 free trade zones and 105 comprehensive cross-border e-commerce pilot zones, with preferential tax exemption and rebate policies and convenient customs clearance conditions promoting the development of cross-border e-commerce enterprises, covering the southeast, north-west and central regions of China, with obvious regional radiation-driven effects, again with the aim of promoting the development of cross-border e-commerce nationwide.

However, as an integral part of international trade, the various difficulties encountered in the traditional trade field are difficult to be avoided by cross-border e-commerce. The not yet sound supporting logistics infrastructure and the lack of guaranteed cross-border payment are not conducive to the development of cross-border e-commerce. Cross-border e-commerce export procedures are inevitably related to trade facilitation, therefore, the development of cross-border e-commerce in China needs to pay more attention to the improvement of trade facilitation level. In this context, it is of

great practical significance to study the degree of trade facilitation in China's provinces and the operational performance of cross-border e-commerce, and to continue to explore the influence effect of trade facilitation on the operational performance of cross-border e-commerce on this basis, in order to develop China's cross-border e-commerce with high quality and better serve the new development pattern of the dual circulation.

2. Literature Review

2.1. Measurement of Trade Facilitation Level

According to the existing literature, the current academic research on the measurement of trade facilitation level mainly focuses on two parts: indicator selection and weight measurement, with rich research content and a relatively complete measurement system.

Regarding the selection of indicators, there are mainly two categories. The first category is to directly draw on the authoritative indices issued by international economic organizations for research. Among them, the Trade Facilitation Index (TFI) released by the Organization for Economic Cooperation and Development (OECD) is the most authoritative index system, which contains 11 primary indicators and 97 secondary indicators. In addition, the Trade Facilitation Index (ETI) released by the World Economic Forum, the Doing Business Index (DB) and the Global Logistics Performance Index (LPI) released by the World Bank provide references for measuring the level of trade facilitation. Felipe J and Kumar U [1], Luisa and Puertas and Garcia [2], and Hao Mengqi and Wang Ting [3] use the LPI index as an entry point to measure the level of trade facilitation in Central Asia and examine the trade benefits from trade facilitation, respectively. The second category draws on the research framework of Wilson et al. [4] to construct a measurement system using port efficiency, e-commerce, institutional environment, and customs environment as indicators, which is currently the most widely used system. Kong Qingfeng and Dong Hongwei [5] introduced indicators such as logistics competitiveness and financial service convenience in the measurement system. Wang Weiguo and Ding Xin [6], on the other hand, construct the indicator system and measure it from five aspects: infrastructure construction, information technology, customs efficiency, financial service efficiency, and legal regulation.

Regarding the weight assignment, there are four main methods: hierarchical analysis [7], arithmetic mean method [4, 8] and principal component analysis [9]. Among them, the arithmetic mean method assigns the same weight to all indicators and does not take into account the influence of heterogeneity of different indicators, while the hierarchical analysis method relies on the subjective judgment of experts to assign values to different indicators and is more subjectively influenced. In contrast, the principal component analysis method extracts the main components through factor analysis, which can overcome the arbitrariness and subjectivity of assigning values to indicators in previous studies.

2.2. Influencing Factors of Cross-border E-Commerce Development

Most foreign studies on the factors influencing the development of cross-border e-commerce have been conducted from the perspective of transaction costs. Lendle A

et al. [10] compared the impact of distance on eBay and traditional international trade, and using a gravity model and adding other control variables such as lack of common language, legal system or free trade agreements, the study found that the impact of distance on cross-border e-commerce was 65% smaller compared to traditional trade. Cardona M. and Duch-Brown N. [11] studied the impact of delivery costs on cross-border e-commerce flows in the EU and found that consumers' concerns about long delivery times reduce their spending on cross-border e-commerce consumption, while eliminating consumers' concerns about delivery costs increases cross-border e-commerce transactions by 5%.

Most domestic scholars study the influencing factors of cross-border e-commerce from the perspective of solving the risks and problems faced in the practical application of cross-border e-commerce and promoting the sustainable and stable development of cross-border e-commerce. In terms of cross-border logistics, Zhang [12] analyzed the current situation and problems of cross-border e-commerce overseas warehouses in terms of payment, law, financing, and storage technology, and proposed targeted solutions. He Jiang and Qian Huimin [13] used methods such as VAR models to verify the synergistic relationship between cross-border e-commerce and cross-border logistics. Regarding the application of e-commerce technology in enterprises, Jinfei Liu [14] establishes an index system to evaluate the use of electronic information technology by enterprises and empirically tests the survey data to point out that the application of e-commerce technology has a positive contribution to the development of cross-border e-commerce enterprises.

There are not many studies on the measurement system of cross-border e-commerce operation performance, and there is no more unified evaluation index system. Most domestic scholars construct corresponding index systems according to the research objects. For example, Yang Jianzheng and Yu Lu [15] have constructed a cross-border e-commerce evaluation index system based on the cross-border e-commerce transaction process, including online marketing, electronic payment, customs clearance, logistics and legal aspects; Zhao Zhitian and Yang Jianzheng [16] have conducted data research on 662 enterprises in China and used it as the basis for constructing a comprehensive evaluation model of cross-border e-commerce capability level for empirical analysis. Xiong Li and Yang Lu [17] relied on the "technology-organization-environment" framework to build a regional cross-border e-commerce comprehensive development level evaluation index system, which includes cross-border The index system includes cross-border e-commerce infrastructure construction, logistics development, customs clearance speed, payment level and transaction environment support level.

2.3. Research on the Relationship Between Trade Facilitation and Cross-border e-commerce

Wilson et al. [4] classified e-commerce as a dimension of trade facilitation and argued that the development of e-commerce is conducive to the improvement of the level of trade facilitation. In terms of qualitative analysis, Chen, X. et al. [18] pointed out that in the development of cross-border e-commerce, it would receive constraints from trade facilitation, and proposed that trade facilitation measures suitable for cross-border e-commerce should be established according to the business processes of cross-border e-commerce. Tu

Xinquan and Jiang Jieyuan [19] suggest advancing the development of international rules for cross-border e-commerce in the absence of unified international rules for cross-border e-commerce, so as to better promote the development of cross-border e-commerce in China. In terms of quantitative analysis, Bernard and Ben [20] found through quantitative analysis of digital products that the differences in regulatory and business environments in trade facilitation have a great impact on the trade flows of cross-border e-commerce. Lu Lu [21] explored the impact of trade facilitation on the development of cross-border e-commerce by constructing a gravity model, and the study showed that trade facilitation facilitates the expansion of cross-border e-commerce exports, while there is variability in the impact effect between high-income and low-income countries. Chai Li and Dong Chen [22] measured the level of trade facilitation in China by incorporating a subdivision index system with five dimensions: infrastructure, e-commerce, regulations, financial services and customs environment, and verified that trade facilitation has a positive effect on China's cross-border e-commerce exports by taking Asian countries along the Belt and Road as a sample. At the same time, it was also found that there were differences in the impact of China's trade facilitation level on the export trade of different regions in West Asia, East Asia, Central Asia and South Asia. Zhang Xibao et al. [23] examined the impact of the construction of China's cross-border e-commerce comprehensive pilot zones on the development of cross-border e-commerce using a quasi-natural experiment based on data from China's cross-border e-commerce comprehensive pilot zones. Zhonghai Cheng and Xiaoyue Wang [24] quantitatively measured the influencing factors on the facilitation of cross-border e-commerce export trade in China by means of a questionnaire survey, which concluded that the application of e-logistics technology is an important driving force to promote the timeliness and security of cross-border e-commerce export trade in China, and that the international network marketing capability and the degree of customs clearance facilitation are important influencing factors to determine the scale of cross-border e-commerce export transactions in China. Network platform construction has the least impact on cross-border e-commerce exports. Zhang Mengting et al. [25] measured China's cross-border e-commerce trade facilitation index based on hierarchical analysis by incorporating three dimensions of customs clearance, logistics and payment, and the study concluded that customs clearance efficiency, logistics system improvement and policy support are the most important factors affecting cross-border e-commerce trade facilitation.

2.4. Literature Review

From the relevant literature on trade facilitation, scholars at home and abroad have conducted more comprehensive studies on trade facilitation, but the measurement system involving trade facilitation, because of different research directions, has selected different indicators and methods. Most scholars have further refined Wilson's indicator system based on a broader coverage, and the main problem still lies in the availability of data.

From the relevant literature on cross-border e-commerce, most scholars at home and abroad have conducted research from the perspectives of the current situation, development direction and influencing factors of cross-border e-commerce development. The research results show that efforts can be

made to create a healthier cross-border e-commerce ecosystem by improving the logistics system and payment system. In contrast, most of the studies by domestic scholars focus on the application of operational perspectives to promote their healthy development through the identification and analysis of hindering factors, but there are fewer analyses of theoretical mechanisms. In addition, there are fewer studies on the measurement system of cross-border e-commerce operational performance.

From the literature on the correlation between the two, scholars at home and abroad have studied the impact of trade facilitation on China's cross-border e-commerce exports from different dimensions, which paves the ground for further in-depth research in this paper. However, the existing studies are mostly based on the export scale perspective, and although they can analyze the relationship between trade facilitation and cross-border e-commerce development to a certain extent, it is difficult to precisely explore the degree of trade facilitation on the operational performance of cross-border e-commerce, i.e., the improvement of development quality. Meanwhile, existing studies are more often based on national-level data or on sample data from China's cross-border e-commerce comprehensive pilot zones, while lacking in examining the impact of trade facilitation development on cross-border e-commerce development from the provincial level.

2.5. Innovation Points

Domestic studies on the combination of trade facilitation and cross-border e-commerce development in China mainly focus on the export scale at the national level, and the research objects are mostly countries along the "the Belt and Road" or ASEAN countries. The research on the impact of trade facilitation on the operational performance of China's provincial cross-border e-commerce in the context of the new double-loop development pattern is still vacant. For the possible innovations in this paper, we will focus on the following three aspects. First, in terms of the construction of trade facilitation index system, in view of the uniqueness of the emerging trade development of cross-border e-commerce, this paper adjusts the traditional trade facilitation level measurement index system and innovative adds indicators such as marketability index, service capability and development potential, so as to construct a set of trade facilitation index system that meets the current development status and actual needs of cross-border e-commerce, which makes the research results of this paper more reasonable. Second, on the construction of the index system of provincial cross-border e-commerce operation performance, due to the limited index system available in the research of previous scholars, this paper mainly refers to the research of Zhang Xiaheng and Chen Yixin (2019), and combines the research objectives of this topic, innovative constructs the market scale index, service support index and growth and development index as the first-level indicators, and uses the coefficient of variation method to measure the weights of each subdivision index. The analysis is more scientific. Thirdly, in the selection of influence variables of the empirical model, considering the current situation of cross-border e-commerce development in China, four control variables, namely, the level of foreign direct investment, the degree of openness to the outside world, whether the province has a cross-border e-commerce comprehensive pilot zone and the degree of government support, are selected in this paper, which are more reasonable

and more targeted.

3. Model Design and Variable Data Calculation

3.1. Model Design

Build an empirical test model for the dynamic relationship between China's provincial Trade Facilitation Index and cross-border e-commerce operation performance:

$$KJDS_{it} = \alpha + \beta MYBLH_{it} + \xi Control_{it} + \mu_{it} \quad (1)$$

$KJDS_{it}$ indicates the provincial cross-border e-commerce operation performance index, $MYBLH_{it}$ surface Trade Facilitation Index, $Control_{it}$ refers to other control variables that affect the operation performance of cross-border e-commerce.

3.2. Measurement of Trade Facilitation Index and Cross-border e-commerce Operation Performance Index.

The degree of trade facilitation reflects the degree of trade facilitation in a region, which can be reflected through the four dimensions of trade marketability index, facilitation infrastructure, service capacity and development potential. This paper uses Fan Gang's product market development score to measure the marketability index. It reflects the

facilitation infrastructure dimension through port trade level, highway density, railway density and communication infrastructure level, reflects the service capacity through two indicators: Internet penetration rate and the number of cross-border e-commerce parks, and reflects the development potential through two indicators: intellectual property protection and e-commerce development level, Specific indicators and data sources are shown in Table 1. The above data are from China's provincial marketability index report (Fan Gang), port Yearbook, local statistical yearbook over the years, China Internet Information Center, statistical yearbook of the State Intellectual Property Office, wind database and China Urban e-commerce development index report.

In addition, the cross-border e-commerce operation performance refers to the existing research, and according to the data availability, select three dimensions and seven sub indicators, as shown in Table 2. The original data for measuring the operation performance of cross-border e-commerce come from Alibaba Research Institute, local statistical yearbooks over the years, the database of the Ministry of Commerce, China information society development report, China regional innovation index report and China Internet Network Information Center.

According to Table 1 sub index system of Trade Facilitation Index and Table 2 sub index system of cross-border e-commerce operation performance index, the weight of each sub index is calculated by coefficient of variation method to calculate China's provincial Trade Facilitation Index and cross-border e-commerce operation performance index.

Table 1. Trade Facilitation Index dimensions and breakdown index system description and data sources

Dimension	Segmented Metrics	Indicator Description
Marketability Index	Marketability Index	Product market development degree rating
Facilitation infrastructure	Level of trade at the port	Ratio of import/export trade at ports to total import/export trade
	Road Density	Road miles per 100 square kilometers
	Rail Density	Rail miles per 100 square kilometers
Service Capability	Communication infrastructure level	Length of fibre access per unit area
	Internet penetration rate	Mobile phones per 100 people
	Number of cross-border e-commerce parks	Number of cross-border e-commerce parks in the province in each year
Development Potential	Intellectual property protection efforts	Ratio of the number of IP enforcement cases to the number of authorizations per year
	E-commerce development level	Provincial E-Commerce Development Index

Table 2. Provincial cross-border e-commerce operation performance measurement index system

Dimension	Segmented Metrics	Indicator Description
Fundamental efficiency	Cross-border e-commerce business density	Number of cross-border e-commerce enterprises
	Cross-border e-commerce transaction value	Annual transaction value of provincial cross-border e-commerce
Serviceability efficiency	Number of cross-border payment companies	Number of registered companies conducting cross-border payments in the province
	Number of cross-border logistics enterprises	Number of cross-border logistics enterprises in the province
	Number of cross-border e-commerce parks	Number of cross-border e-commerce parks in the province in each year
Growth efficiency	Innovation Capability	The province's innovation in cross-border e-commerce is active
	Human Capital	Ratio of the number of people with tertiary education and above to the total number of people in the province

3.3. Other Control Variables and Data Sources

The control variables are the level of foreign direct investment, the degree of openness to the outside world, whether there is a cross-border e-commerce comprehensive test area in the province (based on the approval time limit), and the degree of government support (based on the number of policies and measures issued by the government for the development of cross-border e-commerce (based on the documents)). The level of foreign direct investment is measured by the logarithm of foreign direct investment in the province. The openness is measured by the total import and export trade of the province accounting for the total GDP of the province. Whether the province has a cross-border e-commerce comprehensive test area is a dummy variable. If the province has a cross-border E-commerce comprehensive test area, the value is 1, otherwise the value is 0. The government has issued policies and measures for the development of cross-border e-commerce, which are measured by the number of cross-border e-commerce or e-commerce related documents, and the data are obtained from the Internet through crawler technology. The other data mentioned above are from the provincial local statistical yearbook over the years, wind database and the database of the Ministry of Commerce.

4. Empirical Research

4.1. Full Sample Analysis

This paper uses the panel data of 30 provinces, autonomous regions and cities in China (Tibet Autonomous Region, Hong Kong, Macao and Taiwan, etc. are not included in the sample due to lack of data or difficulties in collection) from 2013 to 2019 for empirical analysis. Based on the panel unit root test of each variable, the model for empirical estimation in this paper is determined to be a fixed effect model through F test and Hausman test. The estimation results are shown in Table 3. Table 3 empirical estimation results show that the impact of trade facilitation on China's cross-border e-commerce operation performance is significantly positive and statistically significant, which confirms the conclusion that trade facilitation is conducive to the improvement of China's cross-border e-commerce operation performance (development quality). From the perspective of impact effect intensity, the degree of trade facilitation has a stronger impact on the operation performance of cross-border e-commerce than other control variables. This shows that the optimization of trade and business environment is very important for the development of cross-border e-commerce export trade. Whether it is the improvement of marketability level, trade facilitation, transportation infrastructure, Internet penetration, or intellectual property protection, it can improve China's trade facilitation level, and then the expansion of China's cross-border e-commerce export scale. The reduction of transaction costs and convenient and efficient circulation will play a beneficial role in promoting the operation performance (development quality) of cross-border e-commerce.

Among the control variables, the increase in the level of foreign direct investment has a significant positive contribution to the improvement of China's cross-border e-commerce operational performance, which may be due to the fact that, with a large amount of foreign direct investment in China's cross-border e-commerce enterprises, the

development of cross-border e-commerce trade has crossed the limits of national borders, such as Target, Etsy, Walmart, eBay, Amazon and other multinational e-commerce platforms also play an important role in promoting China's cross-border e-commerce exports. The advanced operation technology and management level of foreign cross-border e-commerce platforms enter the country in the form of foreign investment, forming the main body of cross-border e-commerce trade in the country and promoting the improvement of China's cross-border e-commerce operation performance. The higher the degree of openness is, the more conducive to the improvement of cross-border e-commerce operation performance, which also verifies the conclusion that the increase of foreign direct investment level is conducive to the improvement of cross-border e-commerce operation performance. In general, the more open the region is, the more active foreign direct investment is, and the easier it is to cultivate cross-border e-commerce operation subjects and promote the development of cross-border e-commerce. Further analysis of the estimated results in Table 3 reveals that the presence or absence of a comprehensive cross-border e-commerce pilot zone has a significant positive contribution to the improvement of cross-border e-commerce operation performance, which is relatively easy to understand. The establishment of a comprehensive cross-border e-commerce pilot zone empowers institutional breakthroughs and model innovations in the operation of cross-border e-commerce in the region, which will certainly have a positive Promotional effect. For example, Hangzhou, as one of the first cross-border e-commerce pilot zones, has made bold attempts and reforms in Internet finance to support the services of the comprehensive cross-border e-commerce pilot zone, and has come up with 85 experiences for national replication, which has played a positive role in promoting the development of cross-border e-commerce. In Shenzhen, for example, the early and pilot implementation of "direct purchase import, online bonded import, special supervisory area export, global central warehouse" has greatly contributed to the expansion of Shenzhen's cross-border e-commerce export scale and the improvement of the operation level. Finally, government support also has a positive empowering effect on the improvement of cross-border e-commerce operation level, which is consistent with theoretical expectations. The more government policies on cross-border e-commerce development are introduced, the more conducive to the development of cross-border e-commerce naturally. To some extent, the introduction of government support policies is to empower institutional innovation and model innovation in cross-border e-commerce development, for example, the establishment of cross-border e-commerce comprehensive trial zone is the biggest government policy support for cross-border e-commerce development, which has a profound impact on China's cross-border e-commerce. This has had a profound impact on the development of cross-border e-commerce in China. A realistic comparison can also reveal that the 35 regions (from the first to the third batches) that have established cross-border e-commerce pilot zones have the level of cross-border e-commerce development is significantly higher than that of other regions, while Hangzhou, Shenzhen, Guangzhou and other first and second batches of cross-border e-commerce pilot zones have been established. The level of cross-border e-commerce operation in the provinces where the first and second batches of cross-

border e-commerce pilot zones were established, such as Hangzhou, Shenzhen and Guangzhou, is also significantly higher than that in other regions. The level of cross-border e-commerce operation is also significantly higher than that of the other provinces where the first and second batch of cities with comprehensive pilot zones for cross-border e-commerce

were set up relatively late. The level of cross-border e-commerce operation in the provinces where the first and second batch of cities with comprehensive pilot zones for cross-border e-commerce are located is also significantly higher than that in the provinces where other cities with comprehensive pilot zones were established later.

Table 3. Estimated results of the impact of trade facilitation on China's cross-border e-commerce operation performance

Variables	Estimated results
Trade Facilitation Index	0.2175***(4.38)
Foreign direct investment level	0.1284***(3.36)
Openness to the outside world	0.1563***(4.53)
Whether there is a comprehensive cross-border e-commerce test area	0.1109***(3.08)
Level of government support	0.0837***(4.12)
Constant term	1.2593***(3.99)

Note: *** indicates that the statistics are significant at the 5% significance level.

Table 4. Estimation results of the impact of trade facilitation on the performance of cross-border e-commerce in different regions of China

Variables	East	Central	West
Trade Facilitation Index	0.3184***(4.64)	0.2058***(3.54)	0.0938***(5.22)
Foreign direct investment level	0.1984***(5.33)	0.1481***(2.79)	0.0998***(3.34)
Openness to the outside world	0.2096***(5.98)	0.1327***(3.46)	0.0863***(4.47)
Whether there is a comprehensive cross-border e-commerce test area	0.1872***(6.03)	0.1421***(4.66)	0.0736***(3.04)
Level of government support	0.1137***(4.96)	0.0657***(3.64)	0.0218***(4.88)
Constant term	0.9875***(3.39)	1.2075***(2.84)	2.0947***(3.95)

Note: *** indicates that the statistics are significant at the 5% significance level.

4.2. Regional Difference Analysis.

From the above full sample estimation results, it can be seen that trade facilitation and control variables have a significant positive enabling effect on the operation performance of cross-border e-commerce. Subsequently, there are great differences in the degree of trade facilitation between different regions in China, which is obviously determined by the differences in resource endowments and business environment between different provinces in China. Therefore, according to the conventional division method, this paper further divides China into three regions: the eastern region, the central region and the western region, and examines the impact of Trade Facilitation Index on the performance of China's cross-border e-commerce among different regions. Also, through the selection of model statistics, the fixed effect model is finally selected, and the estimation results are shown in Table 4. The estimation results in Table 4 show that, firstly, trade facilitation has a significant positive promoting effect on the improvement of China's cross-border e-commerce operation performance, which is consistent with the conclusions obtained from the full sample estimation in Table 3. Secondly, there are significant regional differences in the impact of trade facilitation on the performance of cross-border e-commerce. Trade facilitation has the strongest effect on the performance of cross-border e-commerce in the eastern region, followed by the central region and the western region, showing a gradient decreasing trend of "the stronger the stronger, the weaker". This is in line with the reality. The eastern region has the highest degree of trade facilitation, the best trading environment, and the

strongest improvement in the performance of cross-border e-commerce. In fact, the eastern region is the first region in China to open and also the first pilot region in China to carry out cross-border E-commerce comprehensive pilot zone. In addition, the eastern region has good transportation infrastructure, the most extensive application of Internet informatization and the best port service level, As well as the blessing of various resource endowments, it is obvious that it can bring an enabling role for the development of cross-border e-commerce in China. The estimation results of control variables also show that the high intensity of foreign direct investment (favorable investment environment), the high degree of opening to the outside world, the first and numerous pilot cities of cross-border e-commerce comprehensive pilot zones, and the superior business environment provided by the government (a large number of policies and measures to support cross-border e-commerce development) have laid the foundation for the leapfrog development of cross-border e-commerce in eastern China, The performance of cross-border e-commerce in the eastern region is significantly stronger than that in the central and western regions.

5. Countermeasures and Suggestions

First, improve the level of marketization, create a market atmosphere conducive to fair, just and open competition, break down the institutional barriers that are not conducive to open, fair and fair competition in the market, and fully grasp the relationship between the visible hand of the government and the invisible hand of the market Balance point, give more

play to the basic role of the market in resource allocation, and improve trade and business environment to improve the level of marketization.

Second, improve the infrastructure construction related to trade facilitation, especially accelerate the construction of trade circulation infrastructure such as roads and railways, as well as the infrastructure construction of port customs clearance facilitation, give full play to the functions of Internet information technology, and enable new trade infrastructure by relying on technologies such as big data, cloud computing, artificial intelligence and blockchain, so as to improve the level of trade informatization, improve trade efficiency and reduce trade costs, Promote the operation performance of cross-border e-commerce.

Third, accelerate the full coverage of the Internet in parks and households, and improve the Internet penetration rate. At the same time, it is also necessary to improve the Internet optical fiber access rate, increase the Internet speed, reduce the Internet rate, and promote cross-border e-commerce operation to reduce costs and increase efficiency. On this basis, the construction of cross-border e-commerce parks should be accelerated, especially in the central and western regions. Efforts should be made to obtain cross-border e-commerce comprehensive pilot zones and obtain the first trials of relevant systems and models of cross-border e-commerce, so as to lay the foundation for improving the quality and efficiency of cross-border e-commerce.

Fourth, we should increase technological innovation, strengthen the protection of trade facilitation related intellectual property rights, combat intellectual property infringement, encourage cross-border e-commerce enterprises to carry out technological innovation, improve the operation level of crossborder e-commerce, and ultimately enable the improvement of cross-border e-commerce operation performance.

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