Study on the Influence of Cross-border E-commerce Comprehensive Pilot Zone on Export Trade

-- Empirical Evidence from Panel Data of Six Cities in Anhui Province

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Abstract

Under the new development pattern of double cycle, the comprehensive pilot zone of cross-border e-commerce is of great significance for the region to accelerate the development of new forms and models of foreign trade. It is urgent to explore how to better adapt to the external environment and promote the development of export trade in Anhui Province. This topic selects the total export trade data of Anhui Province from 2015 to 2022, adopts the difference difference method, analyzes the influence mechanism of cross-border e-commerce comprehensive pilot zone on export trade growth from the perspective of policy effect, explores its linear relationship, uses regional heterogeneity analysis and other methods to ensure the robustness of the results, and puts forward relevant policy suggestions according to the conclusions.

Keywords

Cross-border E-commerce Comprehensive Pilot Zone; Double Difference Method; Export Trade.

1. Introduction

The comprehensive pilot zone of cross-border e-commerce is an urban area set up by China for the first trial of the comprehensive nature of cross-border e-commerce. It is conducive to solving the deep-seated contradictions and institutional problems in the development of cross-border e-commerce, and promoting the building of a complete industrial and ecological chain of cross-border e-commerce. In the era of information technology and global economic integration, cross-border e-commerce also develops rapidly with the wide application of the Internet. Cross-border e-commerce reduces the effect of spatial barriers on trade, simplifies the trade process, and promotes the transformation and upgrading of export trade.

Since the State Council approved the establishment of the China (Hefei) cross-border E-commerce Comprehensive Pilot Zone in 2016, Anhui Province's export trade has been breaking through. Anhui Provincial Party Committee and provincial government attach great importance to the construction of the comprehensive pilot zone, taking Hefei City as the base, to point and surface, strategically put forward and actively promote the demonstration and construction of Anhui Province cross-border e-commerce industrial park. Under the new development pattern, the comprehensive pilot zone of cross-border e-commerce is conducive to enhancing the resilience of Anhui's export trade development and injecting new impetus into the economic development. Based on the background of China's double-cycle new development pattern and economic strategic recovery, this topic explores the impact of cross-border comprehensive

pilot zone on the growth of export trade in Anhui province, and puts forward relevant policy suggestions.

2. Literature Review

2.1. Relevant Research on the Comprehensive Pilot Zone of Cross-border E-commerce

The establishment of comprehensive pilot zones for cross-border e-commerce has built a complete system for the development of cross-border e-commerce, and the construction of comprehensive pilot zones for cross-border e-commerce across the country has been steadily improving. Ma Shuzhong and Fangchao (2021) quantitatively analyze the overall and structural impact of China's cross-border e-commerce industrial policies on exports by using the difference difference method, and explore the mechanism of action, and finally conclude that the development of cross-border e-commerce can expand the growth of export margin. Peng Huaian and Zhang Changmou (2023) believe that the comprehensive pilot zone of cross-border e-commerce is an institutional plateau created for deepening reform, further enhancing the level of opening up and supporting the new business forms of cross-border e-commerce, as well as an important measure to promote the transformation and upgrading of industrial structure and achieve high-quality development. Hu Guoliang and Lu Shou 'an (2023) showed that they have accumulated rich and mature experience in the construction of basic framework of cross-border e-commerce comprehensive pilot zone, smooth cross-border e-commerce logistics, facilitation of cross-border e-commerce import and export customs clearance, leading the innovation of cross-border e-commerce development mode and other aspects, which is of great significance for China to accelerate the development of new foreign trade forms and models.

2.2. Related Research on Export Trade and Cross-border E-commerce in Anhui Province

With industrial upgrading and expansion, the export structure of Anhui Province has been continuously optimized, and the overall export trade scale of Anhui province has expanded. Hu Lei (2023) believed that Anhui's export trade structure would usher in an important opportunity for transformation and optimization. However, Yu Maojun and Dou Jin (2020) believed that the volume of foreign trade in Anhui Province was relatively small and its dependence on foreign trade was relatively low. However, the impact and impact of the epidemic were direct and diverse, including shrinking international market demand, difficulties in converting exports to domestic sales, potential risks such as employment, and deep-rooted difficulties in export trade to be solved. Wang Wuyi (2023) concluded through empirical analysis that the establishment of cross-border e-commerce comprehensive pilot zones could effectively promote the development of export trade in the Yangtze River Delta. As the core part of the Yangtze River Delta, Anhui Province's export trade is also closely related to the cross-border e-commerce comprehensive pilot zone.

It can be seen that the comprehensive pilot zone of cross-border e-commerce maintains institutional innovation, management innovation, service innovation and collaborative development, which can continuously adapt to the era of big data and dig deeply various problems at different levels in trade.

3. Model Construction and Data Explanation

This paper selects the relevant annual data of 16 cities in Anhui Province from 2015 to 2022, with Hefei, Bengbu, Wuhu, Anqing, Maanshan, Xuancheng and other cities with cross-border e-commerce comprehensive pilot zones as the experimental group and other cities without cross-border e-commerce comprehensive pilot zones as the control group. The data are mainly from

the China City Statistical Yearbook over the years. Due to the lack of comprehensive data on import and export trade and foreign direct investment, part of the data came from the local statistical yearbook of various provinces, regions and municipalities, Statistical Bulletin of National Economic and Social Development, statistical database of China Economic Network and National Bureau of Statistics.

Drawing on the research methods of Zhou Li 'an et al., the following differential model is constructed:

$$Y_{it} = \beta_0 + \beta_i Treat_i \times Post_t + \gamma_i X_{it} + \theta_i + \mu_t + \varepsilon_{it}$$

Where, Y_{it} is the explained variable, represents the total export, $Treat_i$ represents the policy implementation dummy variable, the experimental group of cities assigned a value of 1, the control group of cities assigned a value of 0; $Post_t$ represents the policy implementation time dummy variable, which is assigned a value of 1 when it is set up in the comprehensive pilot area in t year, and 0 when it is not set up. For the cities in the experimental group, the value is 1 after the establishment of the comprehensive trial zone, and 0 before the establishment of the comprehensive trial zone. In the control group, the value of $Post_t$ is always 0 because there is no comprehensive trial zone. $Post_t \times Treat_i$ is the cross-term of policy effect, and its coefficient, β_1 represents the net effect of policy. X_{it} represents a series of control variables, θ_i represents the individual fixed effect, μ_t represents the time fixed effect, ε_{it} is the random disturbance term.

Table 1. Description of relevant variables and their meanings

Variable name	Meaning and calculation method
Total value of imports and exports ($Trade$)	Represents the level of trade
Policy effect($Treat_i \times Post_t$)	Represents the policy effect of setting up the cross-border e-commerce comprehensive pilot area. If the individual belongs to the experimental group, it is $Treat_i$ 1; otherwise, it is 0; If the comprehensive pilot zone is set up or has already been set up in year t, $Post_t$ 1 is taken; otherwise, 0 is taken
Level of economic development ($PGDP$)	Measured by the level of output per capita, generally speaking, the level of economic development of a region reflects the potential trade demand. The higher the level of economic development, the greater the trade demand
The level of industrialization ($Sein$)	Measured by the ratio of the output value of the secondary industry to GDP, it represents the development level of the regional secondary industry. Generally speaking, the higher the level of regional industrialization, the more ability to provide products and services needed for trade
Free Trade zone (FTA)	Dummy variable, if the city i set up a free trade area in the t year, then the FTA takes 1. The establishment of free trade area generally has a promoting effect on trade
Foreign direct investment (FDI)	Measured by the total amount of foreign direct investment in that year, foreign direct investment promoted the development of export trade in Anhui province, and the relationship between them was generally positive

Table 2. Variable descriptive statistics

Variables		Experimental group			Control group		
		Observed values	mean	Standard deviation	Observed value	mean	Standard deviation
Explained variable	ln *Trade*	212	0.875	1.281	156	0.521	1.365
Explanatory variables	$Treat_i$ x $Post_t$	212	0.063	0.135	156	0	0
Control Variables	ln *PGDP*	212	10.455	0.599	156	9.576	0.612
	ln *Sein*	212	3.632	0.301	156	3.644	0.298
	FTA	212	0.151	0.29	156	0.113	0.263
	FDI	212	25.337	26.252	156	12.153	16.814

As can be seen from the descriptive statistical results, the mean values of explained variables in the experimental group were higher than those in the control group, suggesting that the establishment of cross-border e-commerce comprehensive pilot zones effectively promoted the development of import and export trade. The standard deviation of the explained variables of the experimental group and the control group is large, which reflects the imbalance of import and export trade development between regions. It can be seen from the control variables that the mean value of the control variables of the experimental group is basically higher than that of the control group, among which the most prominent one is foreign direct investment, and the huge standard deviation of FDI indicates that there is a large difference between different regions in foreign direct investment.

4. Analysis of Regional Heterogeneity

Comprehensive pilot areas of cross-border e-commerce are widely set up in the central and southern parts of Anhui Province, with obvious characteristics of unbalanced regional development. Therefore, the influence degree of policy effectiveness varies among different regions. Based on this, this paper conducts regional heterogeneity test to verify the policy effect of the cross-border e-commerce comprehensive pilot zone by region. The samples are divided into southern and non-southern regions, representing the economically developed regions and the regions with average economic development.

Table 3. Regional heterogeneity test results

Variables	Southern region	Non-southern regions
	ln *Trade*	ln *Trade*
Treat×Post	0.178	0.180
Constant term	3.851	9.642
Control variables	K	K
Time fixation effect	K	K
Individual fixation effect	K	K
Sample size	212	212
R^2	0.985	0.936

As can be seen from the table, the coefficients of the cross-term of policy effect of the total import and export volume of the southern region are significantly positive, indicating that the establishment of the cross-border e-commerce comprehensive pilot zone has a significant promoting effect on the import and export volume of the southern region, while the coefficient of the cross-term of policy effect of the total import and export volume of the non-southern region is positive but not significant. Because the economy of the southern region is relatively developed, The level of resource endowment and infrastructure is higher than that of the non-southern region, so the southern region has the basic conditions and guarantee facilities for the establishment of cross-border e-commerce comprehensive pilot zone, and can provide supporting facilities for the establishment of cross-border e-commerce comprehensive pilot zone. Moreover, due to the higher technical level of the southern region, it can meet the requirements of the establishment of cross-border e-commerce comprehensive pilot zone on the technical level of urban informatization construction. The development level of cross-border e-commerce in the southern region is also relatively high, so the policy effect of the establishment of cross-border e-commerce pilot zone in the southern region is easier to play, to enhance its ability to provide products and services, and its market consumption potential is relatively large, thus promoting the development of import and export trade in the southern region. However, in the non-southern regions, the establishment of cross-border e-commerce comprehensive pilot zone has little impact on the import and export trade in the non-southern regions, as it is difficult to fully implement the corresponding supporting measures for the establishment of cross-border e-commerce comprehensive pilot zone, and the corresponding policy effect is difficult to fully emerge in a short period of time

5. Conclusions and Policy Implications

5.1. Strengthen the Social Research in the Location of the Comprehensive Pilot Zone of Cross-border E-commerce

Before cross-border e-commerce is conducted, a full social survey should be conducted to understand the local economic conditions, social needs and employment conditions. This helps identify key areas and projects for investment to better meet local needs and promote economic development.

5.2. Strengthen Experience Sharing in Pilot Areas

At present, China has built four batches of comprehensive pilot zones for cross-border e-commerce, gradually exploring and forming some mature experience practices that can be copied and promoted. To build cross-border e-commerce in the information age, we should vigorously promote data exchange among government departments, further optimize the import and export workflow such as customs clearance, tax declaration and settlement, and open up information communication channels. To realize the connectivity among government supervision, financial institutions, cross-border e-commerce enterprises and logistics enterprises

5.3. Promoting Technology Transfer and Personnel Training

Anhui Province can improve the industrial level and job opportunities in the provinces along the routes through technology transfer and personnel training. By introducing advanced technology and management experience, the province can enhance the competitiveness of local enterprises, create more job opportunities, raise the skill level and income of laborers, and create conditions for the establishment of more comprehensive pilot zones for cross-border e-commerce.

5.4. Encourage Sustainable Development and Environmental Protection

Pay attention to sustainable development and environmental protection in investment projects, abide by local environmental laws and regulations, adopt environmental protection measures and reduce the negative impact on the environment. It can promote the development of a low-carbon economy, encourage the use of clean energy and promote the efficient use of resources, thus driving sustainable economic growth.

5.5. Establish a Scientific Evaluation System

Establish a scientific evaluation system to evaluate and monitor the social and economic benefits of investment projects. Through regular evaluation and feedback, problems should be identified in time and measures should be taken to improve them, so as to ensure that the effects of cross-border e-commerce can be sustained and enhanced.

Acknowledgments

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