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Research on the impact of China's comprehensive pilot zone policies on economic growth from the perspective of dual circulation: An empirical study based on provincial panel data in Jiangsu, Zhejiang and Shanghai regions

Jinming Li[a,*], Ziyihui Yang[b], Chan Huang[c]

School of Economics, Guangdong University of Finance and Economics, Guangzhou, China
[a]a13148941341@163.com, [b]yangziyihui2022@163.com, [c]huangchan@gl.-xcl.com
**Corresponding author*

Abstract: *In May 2020, the central government proposed to build a dual-circulation development strategy with the domestic cycle as the leading factor and the domestic and international cycles reinforcing each other. As of 2020, China has established total 105 cross-border e-commerce comprehensive pilot zones, covering 30 provinces, Autonomous regions and municipalities. However, how effective is the implementation of the cross-border e-commerce comprehensive pilot zone? Can it effectively promote economic growth? This paper takes the cross-border e-commerce comprehensive pilot zone established in Jiangsu, Zhejiang and Shanghai during 2010-2019 as the research object, builds panel data with reference to relevant studies, and evaluates the policy effect of cross-border e-commerce comprehensive pilot zone by using the difference-difference method. The results show that the cross-border e-commerce comprehensive pilot zone can significantly promote regional economic growth.*

Keywords: *cross-border e-commerce comprehensive pilot zone; economic growth; double difference*

1. Introduction

The development momentum of cross-border e-commerce in China is strong, which is not only supported by favorable policies and standardized industry development, but also supported by the accumulation of consumer market and development experience. China has the potential and strength to lead the world in cross-border e-commerce. With the rapid development of cross-border e-commerce, China is actively seeking ways to overcome difficulties based on the current development situation. Four batches of comprehensive pilot zones have been established successively, aiming to make innovations and breakthroughs in warehousing and logistics, payment and settlement, customs clearance and tax refunds, solve difficult and pain points, and innovate supervision models and development models. The continuous expansion of the comprehensive pilot zones reflects the contribution of the cross-border e-commerce industry to China's economic growth and social stability, and also reflects the good experience and practices of the first two batches of comprehensive pilot zones. The establishment of the comprehensive pilot zone has gathered a large number of small and medium-sized enterprises, which has promoted the growth of new cross-border e-commerce formats and increased employment. In addition, it also shows that the experience and practices of the first two batches of comprehensive pilot zones have become more systematic and can be promoted.

Based on its unique advantages, cross-border e-commerce can effectively release domestic consumer demand, effectively reduce trade costs, promote trade facilitation, promote consumption upgrades, and introduce new data production factors. Cross-border e-commerce exports can not only link the domestic supply side, promote industrial transformation and upgrading, promote product and technological innovation, and help the country implement supply-side reforms, but can also link the domestic demand side, improve consumption levels and release domestic consumption potential. This fully reflects the endogenous logic of cross-border e-commerce in promoting the construction of a new dual-circulation development model. Promoting the construction of a dual-circulation development model, the infrastructure and environment required for cross-border e-commerce can quickly realize the construction path of cross-border e-commerce and promote a new dual-circulation development model.

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This article selects the cross-border e-commerce comprehensive pilot zone in the Jiangsu, Zhejiang and Shanghai regions as the research object, and uses the relevant data of various districts and cities in the Jiangsu, Zhejiang and Shanghai regions from 2010 to 2019 to try to explore the impact of the establishment of the comprehensive pilot zones on regional economic growth from an empirical perspective. This article only verifies the impact of the cross-border e-commerce comprehensive pilot zone on economic growth, but does not conduct an empirical analysis on the impact of factors within the mechanism on economic growth. Due to workload issues, the empirical part of this article only takes the comprehensive pilot zones in Jiangsu, Zhejiang and Shanghai as the research object, and lacks empirical analysis of the economic effects of comprehensive pilot zones established across the country.

2. Literature review

In the study of how e-commerce promotes economic growth, from a micro level, e-commerce can not only improve consumer shopping efficiency, increase consumer spending, but also save transaction costs for enterprises; at a meso level, e-commerce can promote the scale structure of enterprises. The adjustment will drive the development of related industries and be conducive to the growth of import and export trade; at the macro level, e-commerce drives economic growth through economies of scale and consumption multiplier effects (2014).[1] Yang Min (2017) conducted an in-depth analysis based on the inframarginal analysis theory and found that e-commerce reduces costs in the operation process, thereby reducing the final price of goods.[2]

Wang Chaoxian (2016), based on the perspective of the circulation system, believes that e-commerce has improved the basic structure of China's circulation system, played an important role in reforming the circulation field, and also promoted economic growth.[3] Currently, China's cross-border e-commerce also has the "Belt and Road" The positive effects brought by the "One Road" dividends, but uneven regional development is a constraint. The newly established two batches of comprehensive pilot zones are obviously tilted towards the central, western and northeastern regions and non-provincial capital cities, and at the same time have played a role in improving the imbalance of regional development to a certain extent.

Lin Yuanchun and Zhang Juntao (2019) summarized the experience in the construction of comprehensive pilot zones, including comparing the basic advantages and development priorities of the four comprehensive pilot zones of Hangzhou, Guangzhou, Ningbo, and Zhengzhou, and establishing a scientific management system.[4] Zhang Xiaodong (2019) studied the degree of coupling between the cross-border e-commerce system, including cross-border e-commerce, e-commerce, e-commerce logistics and foreign trade, and the current economic situation, social consumption, human resources services and technology.[5] The degree of coupling between the two systems is used in the cluster analysis of the comprehensive test domain. The increase in the number of cross-border e-commerce policies issued by the government can promote the expansion of cross-border e-commerce. At the same time, the support of cross-border e-commerce policies for e-commerce companies is conducive to the industrial agglomeration effect in the region (2020).[6]

Ding Huiping (2019) divided the existing 13 cross-border e-commerce comprehensive pilot zones into three development levels and believed that the four major systems of the pilot zones should be strengthened, namely information sharing, financial services, logistics support and credit systems.[7] Lin Yuanchun and Zhang Juntao (2019) put forward suggestions for the construction of Zhengzhou comprehensive cross-border e-commerce pilot zone based on a comparative analysis of my country's cross-border e-commerce comprehensive pilot zones. [4] Wang Rui, Gu Qiuyang, and Zhong Bingping (2020) analyzed the impact of different factors on the comprehensive pilot field of cross-border e-commerce from the perspective of trade facilitation factors, and believed that cross-border e-commerce was different from traditional trade and needed to coordinate cross-border e-commerce systems more flexibly, including transportation, warehousing, customs clearance, settlement, payment, exchange and tax.[8]

3. Research design

3.1. Model building

Cross-border e-commerce comprehensive pilot projects are promoted in different cities in different years, which provides a quasi-natural experiment for studying the impact of cross-border e-commerce

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comprehensive pilot zones on economic development. Therefore, this article uses the double difference method to explore the impact of cross-border e-commerce comprehensive pilot zones on economic development. First set two dummy variables: (1) Experimental group and control group dummy variables treated. The cities that have implemented cross-border e-commerce comprehensive pilot zones are set as the experimental group, that is, treated=1; the remaining cities that have not implemented cross-border e-commerce comprehensive pilot zones are set as the control group, that is, treated=0. (2) Time dummy variable time. Set the year when the city starts to implement the cross-border e-commerce comprehensive pilot zone policy and subsequent years as time=1, and the remaining years as time=0. Therefore, the multiplication term treated×time of the above two dummy variables is the impact of the cross-border e-commerce comprehensive pilot zone on economic growth, that is, the double difference term did constructed in this article. In this way, this article builds the following model:

$$Develop_{i,t}=\beta_0+\beta_1 did_i, t+\beta_2 X_{i,t}+\mu_i+\eta_t+\varepsilon_{i,t}$$

Among them, i is an urban individual, t is time, develop is a measure of urban economic development, and X is a control variable. did is the double difference item, which refers to the cities that implement the cross-border e-commerce comprehensive pilot zone policy in that year and in subsequent years. εis the random interference term, μ_i is the individual effect, η_t is the time effect, β_0 is the constant term, and β_2 is the estimated coefficient vector of the control variable X. The estimated coefficient β_1 is a double difference regression coefficient, through which we can understand the impact of the establishment of a cross-border e-commerce comprehensive pilot zone on economic growth.

3.2. Selection of variables and description of data

(1) The explained variable. The explained variable in this article is urban economic development, measured by the gross regional product (gdp) and per capita gross product (per gdp) of each city in that year. Regional GDP per capita refers to the actual GDP of the region divided by the total resident population at the end of the year; all original data come from the statistical yearbooks of prefecture-level cities.

(2) Explanatory variables. The cross-border e-commerce comprehensive pilot zone is a dummy variable, and the coefficient obtained from the regression of the double difference term did is the policy effect of the cross-border e-commerce comprehensive pilot zone on economic development. According to the list of comprehensive pilot zones approved by the State Council, each county-level city is assigned a value. If a city has started to establish or has established a cross-border e-commerce comprehensive pilot zone in the same year, it will be assigned a value of 1, otherwise it will be assigned a value of 0.

(3) Control variables.

①According to existing literature, this article uses the government development level (gov) as one of the control variables, and uses the ratio of fiscal expenditures within the government budget to GDP to measure the government's role in economic development(2015).[9] ②Changes in industrial structure are the Granger cause of economic growth (2016).[10] Modern economic growth is economic growth dominated by changes in industrial structure. Therefore, referring to the existing literature, the ratio of the added value of the secondary industry to GDP is selected as the development level of the secondary industry (sec), and the ratio of the added value of the tertiary industry to GDP is (thi). ③Foreign direct investment can be regarded as a carrier of capital, technology and management experience, and can promote economic growth in various ways. Based on this, this article uses the ratio of actual foreign direct investment to GDP to reflect the level of foreign direct investment (fdi). ④Fixed asset investment can improve infrastructure and expand production scale, thereby promoting economic growth. Referring to relevant research, this article uses the ratio of fixed asset investment to GDP to reflect the level of fixed asset investment (growth). ⑤Neoclassical growth theory believes that further opening up of trade will bring economies of scale and promote the efficiency of capital accumulation and resource allocation. Therefore, this article chooses the ratio of total imports and exports to gross domestic product to represent trade dependence (trade). ⑥The improvement of social consumption level will stimulate the expansion of social production scale, thereby promoting sustained economic growth. Therefore, drawing on relevant literature practices , the ratio of total retail sales of consumer goods to GDP is used to characterize social consumption level (consum).

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4. Empirical Analysis

This paper first examines the direct impact of integrated pilot zones for cross-border e-commerce on economic growth. Table 1 is the regression result of the fixed effect of difference-in-difference method. Columns (1) and (2) are the fixed effect regression results of GDP and per capita GDP without adding control variables, respectively. Columns (3) and (4) are the fixed effect regression results after adding control variables. The results show that the regression coefficient of the difference-in-difference item did is significantly positive, whether or not the control variable is added to the regression. This suggests that the construction of integrated pilot zones for cross-border e-commerce has significantly promoted local economic development, and the net effect on per capita GDP is greater than the net effect on GDP.

Table 1: Baseline regression results.

	(1)	(2)	(3)	(4)
	gdp	pergdp	gdp	pergdp
did	0.333***	1.157***	0.082***	0.625***
	(9.92)	(6.25)	(2.85)	(3.71)
govsize			-1.297***	-9.026***
			(-3.61)	(-4.30
second			-1.265	-27.077***
			(-1.58)	(-5.78)
third			2.233**	-25.876***
			(2.41)	(-4.77)
fdi			0.669	-16.154***
			(0.79)	(-3.26)
growth			-0.104*	-1.167***
			(-1.72)	(-3.30)
trade			-0.372***	-0.114
			(-7.07)	(-0.37)
consum			-0.776***	-9.241***
			(-3.05)	(-6.21)
time effect	Yes	Yes	Yes	Yes
N^2	230	230	230	230
R^2	0.966	0.971	0.986	0.986
F	47.160	230.250	66.227	241.766

*, **, and *** represent the significance levels of 1%, 5%, and 10% respectively; the values in parentheses are t values, and the same applies to the following tables.

From an overall perspective, it can be seen, based on the results in Table 1, that regardless of whether or not control variables are included, when using GDP and per capita GDP as the dependent variables, the regression coefficient of the comprehensive test area (CTA) is significantly positive. This indicates that the CTA has a significant positive impact on GDP and per capita GDP. With and without control variables, the net effect of the CTA on GDP is 0.333 and 0.082, and on per capita GDP is 1.157 and 0.625, respectively. It can be observed that whether or not control variables are included, the net effect of the CTA on per capita GDP is always greater than its effect on GDP, indicating that the CTA's promotion of per capita GDP is faster. This may be due to the establishment of the CTA improving the development environment for market entities through trade facilitation, reducing transaction costs, and promoting regional economic growth effects, but without bringing about a corresponding population growth effect, leading to a greater promotion effect on per capita gross domestic product than on the region's overall gross domestic product.

Further analysis of the control variable coefficient. From the analysis of the promotion effect on per capita GDP, the coefficients of government size (govsize), the level of development of the secondary industry (second), the level of development of the tertiary industry (third), the level of foreign direct investment (fdi), the level of fixed asset investment (growth), and the level of social consumption (consum) are significantly negative. Taking the analysis of the promotion effect on GDP as an example, the development level of the tertiary industry third) is significantly positive, indicating that the development of the tertiary industry and the maintenance of a reasonable fiscal balance are important driving forces for economic growth.The coefficient of government size (govsize) is negative, indicating that the government's excessive intervention in the market hinders the role of the market in resource allocation. The market economy can stabilize on its own and should be allowed to play a fundamental role in improving the efficiency of economic activities. The government should intervene when the

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market fails.

The coefficient of fixed asset investment level (growth) is significantly negative, which proves that the level of fixed assets has a certain restriction on the promotion of economic growth. It is not simply relying on expanding the scale of fixed asset investment but optimizing the existing investment structure. The coefficient of social consumption level (consum) is significantly negative, indicating that there is a significant negative correlation between the level of social consumption and economic growth. Residents' consumption structure and consumption growth will determine the industrial structure, industrial growth and the whole economic growth through the industrial correlation effect. The widening income gap between urban and rural residents in China leads to differences in consumption structure, and insufficient market structural demand also seriously restricts economic growth. Due to the ongoing transition in our country's economy from industrialization to urbanization, the level of development in the secondary sector (second) is not significant. The previous development model, which relied on simple processing exports and expanding market size to drive economic growth, is no longer viable in the context of a saturated global market. The secondary sector is no longer a sustained driving force for economic growth.

The lack of significance in the coefficient for the level of foreign direct investment (FDI) is due to the presence of economic growth convergence. The improvement in domestic industrial sectors in the eastern region has reduced the positive spillover effects of foreign investment due to improvement. When attracting foreign investment, consideration should be given to high technological levels and advanced management practices of foreign investment.

5. Conclusion and Suggestions

To assess the implementation effect of integrated pilot zones, based on the panel data of 23 prefecture-level cities in jiangsu-zhejiang-shanghai area from 2010 to 2019. It uses the establishment of integrated pilot zones as the policy time variable and adopts the Difference-in-Differences (DID) method to evaluate the policy effect of establishing a integrated pilot zones for cross-border e-commerce. The study found that the establishment of the integrated pilot zones has produced significant policy effects, which has played a significant and powerful role in promoting the development of cross-border e-commerce in the integrated pilot zones. This means that the experience gained from the pilot can be further promoted to more non-pilot areas, thus better and faster promoting the development of cross-border e-commerce in China. The main theoretical and empirical results of this study are as follows: whether or not control variables are included, the establishment of the integrated pilot zones has a significant positive impact on the regional GDP and per capita regional GDP, and the net effect on per capita GDP is greater than GDP, indicating that the promotion effect of establishing a integrated pilot zones for cross-border e-commerce on per capita GDP is greater than its promotion effect on regional GDP. To support the development of cross-border e-commerce, it is necessary to combine the local industrial reality with the goal of promoting the development of local key industries, rather than simply increasing the transaction volume of cross-border e-commerce and introducing leading cross-border e-commerce leading enterprises as the sole criterion for determining whether local cross-border e-commerce is developed. The overall principle and starting point should be whether it brings support to the local economy. Regarding the newly established cross-border e-commerce integrated pilot zones, although the western and middle regions have substantial gaps in industrial structure, transportation conditions, and e-commerce environment, they can learn from the mature experience of areas like Hangzhou to reduce the gap with the integrated pilot zones, maintain steady growth, explore a suitable development model based on regional location, resource advantages, and characteristic industries. Based on the pilot projects for commercial retail imports and the country's proactive measures, strategic market procurement trade models need to be formulated, and the combination of "market procurement" and "cross-border e-commerce" for export business needs to be explored. Combining the actual situation of various provinces and cities to form a fully networked commercial import consumption system. Effectively utilizing the cross-border e-commerce retail import model will promote the import of high-quality goods and meet the consumption needs of the domestic market. Regions such as Hangzhou and Shanghai, where e-commerce itself develops rapidly and have established trial areas earlier, should focus on further innovation, addressing severe homogenous competition issues, forming economies of scale and spillover effects, and accelerating sustainable growth.

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