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Is China's Pilot Free Trade Zones Promote Foreign Trade: An Empirical Analysis of Guangdong Province

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Abstract

Since 2013, China has set up pilot free trade zones to carry out major institutional innovation attempts in reform and opening up, which has become a unique special economic zone in the world. Based on counterfactual analysis, this paper empirically studies the impact of Guangdong Pilot Free Trade Zone on the import and export of Guangdong Province. The results show that there is a negative relationship between import and export, which is not in line with the expected judgment. This paper tries to analyze the results from the perspectives of policy effect, the nature of the Pilot Free Trade Zone, regional characteristics and research methods, and further puts forward the research enlightenment and further research direction.

Keywords: Pilot Free Trade Zone; Foreign trade; Counterfactual analysis

1. Introduction

In order to further expand the opening-up in an all-round way, China has carried out the so-called "stress test" in the way of "first trial". Since 2013, China has set up pilot free trade zones (hereinafter referred to as the "FTZ"), and hopes to make a promotion and replication in a wider range of the country after passing the test. This is not only an attempt of institutional innovation in China, but also rare in the global scope. This policy is not the same as the "Free Trade Port" adopted by many countries. Its main purpose is to connect with relevant international rules and carry out a series of major reform attempts, and serve as the "experimental field" of domestic overall system reform, so as to provide experience for the reform in other regions of China in the next step. At present, China has built 14 pilot free trade zones. The main areas of institutional innovation in these zones include the following four aspects: trade liberalization, investment facilitation, financial reform and government management reform. Among them, in the aspect of international trade management, the construction of "single window", the classified supervision of goods status and the 24-hour customs clearance system have been implemented. By simplifying the various links required by trade activities, the level of trade facilitation has been greatly improved, thus further promoting the development of foreign trade.

With the earliest foreign trade development in China, Guangdong Province at present has the largest development scale, and its trade development level is higher than that of other regions. Taking Guangdong Pilot Free Trade Zone as an example, this paper employs the counterfactual analysis method to study the impact of the FTZ on import and export trade. The second part is literature review, and then empirical methods. The fourth part is the empirical results and analysis, and finally the conclusion and enlightenment.

2. Literature Review

As FTZ in the world is an emerging thing, the relevant empirical research is still not much. Most of the research on the impact of FTZ on import and export trade is concentrated in Shanghai Free Trade Zone, which is analyzed by traditional methods. Taking Shanghai Free Trade Zone as an example, He Qin and Yang Qiong (2014) constructed a comprehensive evaluation model of trade facilitation level, and conducted empirical test based on the trade gravity model. It was found that compared with GDP, per capita GDP and other factors, the level of trade facilitation had the greatest impact on the total import and export. Jin Zehu and Li Qingqing (2016) analyzed the import and export volume data of Shanghai Free Trade Zone, and concluded that the import and export volume of Shanghai Free Trade Zone was in a positive and active state. The growth rate of its import and export volume and total import and export volume were high, and its international economic status was also constantly improving.

Based on the newly developed counterfactual analysis approach, some literatures have studied the economic and trade effects of FTZ. Tan Na and Zhou Xianbo et al. (2015) used the panel data of 31 provinces and cities to conduct a counterfactual analysis on the changes of the growth rate of industrial added value and the growth rate of total import and export in Shanghai before and after the establishment of Shanghai Free Trade Zone. The empirical results showed that the two variables of Shanghai had increased by 2.69% and 6.73% respectively after the establishment of FTZ. Wang Lihui and Liu Zhihong (2017) analyzed the economic effect of the establishment of FTZ on Shanghai by using two methods: the panel data policy evaluation method and the composite control method. The study found that the total amount of local import and export had been significantly increased after the establishment of FTZ, and the impact measured by the two different evaluation methods was 2.34% and 2.23%. Based on the fact that there is a certain degree of similarity in the economic development between provinces and cities, Yin Hua and Gao Weihe (2017) conducted a research on the counterfactual analysis method, which showed that the import and export of Shanghai region had been significantly promoted after the establishment of FTZ. Liu Binglian and Lu Cheng (2018) used the synthetic control method to construct the counterfactual estimation value, and concluded that FTZ effectively promoted the regional trade liberalization, significantly increased the total import and export volume, and played a positive role in economic development, but the specific impact was different in different regions.

However, some scholars take other FTZs as the research objects and draw different conclusions. Han Peijun (2018) used the intervention analysis model to analyze and predict the impact of the establishment of Sichuan Free Trade Zone on the scale of agricultural import and export. The results showed that in the short term, the establishment of FTZ would intensify trade competition and reduce the scale of agricultural products trade due to the gap between the quality of agricultural products in Sichuan and international standards. But in the long run, with the further opening up, FTZ would be beneficial to the agricultural trade in Sichuan. This different research results and mechanism analysis provide the basis for further research.

To sum up, the trade and economic effects of the establishment of FTZ have been studied in many aspects, and some achievements have been made. However, due to the development time, most of the research is concentrated in Shanghai Free Trade Zone. The research of Han Peijun (2018) shows that there may be different conclusions and mechanisms, which indicates the research space of this topic. At the same time, in the literature using counterfactual analysis approach, the experimental period of empirical analysis does not involve the time after the establishment of the third batch of FTZs. Based on the counterfactual analysis approach proposed by Hsiao et al. (2012), this paper constructs an empirical model, and takes the establishment of the third batch of FTZs into consideration during the experimental period, and estimates the processing effect of the establishment of Guangdong Free Trade Zone on local imports and exports.

3. Empirical Model and Data

(1) Empirical model based on counterfactual analysis

The foundation of counterfactual analysis approach based on panel data is the correlation between cross-section individuals. It is assumed that there are some common factors that determine the cross-sectional correlation between individuals, but their effects on each cross-section individual are different. Most scholars use the double difference method to evaluate the policy effect, but the assumption of the double difference method is very strict. The treatment group and the control group should be affected by common factors, and the degree of influence must be the same. However, counterfactual analysis approach can relax the randomness assumption of double difference method, so it has some advantages.

Suppose that there are N observation samples in period T, define y_{it} as the result of the observation sample at time t, and the goal is to measure the average effect of policy intervention on y_{it}, which is the difference between the treatment effect in the case of policy implementation and policy non-implementation. Define y_{it}^0 as the result of y_i at time t when the policy is not implemented, it can be represented by the following factor model (Forni and Reichlin, 1998) (Gregory and head, 1999):

$$y_{it}^0 = b_i f_t + a_i + e_{it}, \qquad i = 1,2,\dots,N, t = 1,2,\dots,T$$

f_t is the K × 1-dimensional common factor vector which changes with time, b_i is the 1 × k-dimensional coefficient vector which varies with the region, a_i is the fixed effect of each variable, e_{it} is a random perturbation term and satisfies $\mathrm{E}(e_{it}) = 0$.

Define y_{it}^1 as the result of y_i at time t when the policy is implemented, then the treatment effect of the i[th] unit at time t can be expressed as follow:

$$\Delta_{it} = y_{it}^1 - y_{it}^0$$

Define a dummy variable d_{it}, which is independent of the random perturbation term e_{it}. $\mathrm{d}_{it} = 1$ means there is policy intervention on y_i at time t, $\mathrm{d}_{it} = 0$ means there is no policy intervention on y_i at time t, then the observed y_{it} can be expressed as follow:

$$y_{it} = d_{it} y_{it}^1 + (1 - d_{it}) y_{it}^0$$

Suppose the policy is implemented at $T_1 + 1$ but not at T_1, and the policy intervention only affects the first sample, but has no effect on the other samples, then:

$$y_{1t} = y_{1t}^0, \qquad t = 1,2,\dots,T_1$$
$$y_{1t} = y_{1t}^1, \qquad t = T_1 + 1, T_1 + 2,\dots,T$$
$$y_{it} = y_{it}^0, \qquad i = 2,3,\dots,N, t = 1,2,\dots,T$$

So the policy treatment effect of y_{1t} can be expressed as follow:

$$\Delta_{1t} = y_{1t}^1 - y_{1t}^0, \qquad t = T_1 + 1, T_1 + 2,\dots,T$$

However, y_{1t}^1 and y_{1t}^0 cannot be observed at the same time. In the period of $T_1 + 1, T_1 + 2,\dots,T$, only y_{1t}^1 can be observed. In order to estimate Δ_{1t}, we need to construct the missing counterfactual result y_{1t}^0 in this period. When the observation sample N and time T are not very large, generally speaking, other observation samples can be selected as the control group. We can replace f_t with $\tilde{y}_t^0 = (y_{2t}^0,\dots,y_{Nt}^0)'$ to predict y_{1t}^0. Specifically, we firstly use the data of the period of $1,2,\dots,T_1$ to fit y_{1t}^0 and obtain $\hat{y}_{1t}^0 = a_1 + \hat{a}_2 y_{2t}^0 + \cdots + \hat{a}_N y_{Nt}^0$. After this we estimate y_{1t}^0 to obtain the counterfactual estimated value as follow:

$$\hat{y}_{1t}^0 = a_1 + \hat{a}_2 y_{2t}^0 + \cdots + \hat{a}_N y_{Nt}^0, \qquad t = T_1 + 1, T_1 + 2,\dots,T$$

The estimated value of the treatment effect Δ_{1t} is as follow:

$$\hat{\Delta}_{1t} = y_{1t}^1 - \hat{y}_{1t}^0, \qquad t = T_1 + 1, T_1 + 2,\dots,T$$

If the time series of estimated value of the treatment effect Δ_{1t} is stationary, the long-term treatment effect can be calculated by the following formula:

$$\hat{\Delta}_1 = \frac{1}{T - T_1} \sum_{t=T_1+1}^{T} \hat{\Delta}_{1t}$$

It can be proved that $\hat{\Delta}_1$ is the consistency estimation of Δ_1. Simulation results show that the estimation error of the prediction method is relatively small (Hsiao et al., 2012).

According to the model, we need to select part of the observation samples from the policy non-implementation as the optimal control group to fit the counterfactual value of the individuals affected by the policy intervention. There are many methods to select the optimal control group. In this paper, stepwise regression method is used to screen to avoid multicollinearity. AIC criterion and the value of $Adj. R^2$ are used as the selection criteria of optimal control group.

(2) Data source and description

Taking Guangdong Free Trade Zone as the research object, this paper compares the growth rate of import volume and export volume of Guangdong Province before and after the establishment of FTZ to investigate the impact of the establishment of Guangdong Free Trade Zone on the import and export trade of Guangdong Province. The data of this paper is from the General Administration of Customs of China. Using the monthly data of import and export of 31 provinces, cities and autonomous regions, the year-on-year growth rates of the two are calculated.

In this paper, the sample data is selected from January 2008 to May 2018, a total of 125 issues. Since the Guangdong Free Trade Zone was officially established in April 2015, the stage before experimental period (before the establishment of FTZ) in this paper is from January 2008 to April 2015, $T_1 = 88$; the stage of experimental period (after the establishment of FTZ) is from May 2015 to May 2018, $T_2 = T - T_1 = 37$.

4. *Empirical Results and Robustness Test*

(1) Selection of the experimental group sample

Before the empirical analysis, this paper firstly makes a stationary test on the series. The results show that the year-on-year growth rate of Sichuan Province's import volume and that of Henan Province's export volume have not passed the test. These two will be eliminated in the subsequent empirical analysis. According to the model, we firstly use stepwise regression method to fit the two indicators of Guangdong Province by using the growth rate of import and export of other regions. Then, considering AIC and $Adj. R^2$ obtained from the regression equation, when both values are the minimum, the provinces and cities contained in the equation constitute the optimal control group.

When selecting the optimal control group, the provinces and cities that have set up FTZ should be excluded. Considering that the third batch of FTZs was officially established in April 2017, the experimental period is divided into two stages according to this time point, so as to ensure the fitting effect as much as possible while eliminating interference. Stage 1 is from May 2015 to April 2017, and stage 2 is from May 2017 to May 2018. In stage 1, Shanghai, Fujian and Tianjin should be excluded; in stage 2, the third batch of provinces and cities with FTZ should be excluded.

Table 1 and Table 2 are the weights of the optimal control group for the year-on-year growth rate of Guangdong's import volume after fitting Guangdong Province with the data of other provinces and cities before the experimental period. The results show that the year-on-year growth rate of Guangdong's import volume can be well fitted by Ningxia, Shanxi, Yunnan, Shandong and Shaanxi on stage 1, and Gansu, Shanxi, Yunnan, Shandong and Inner Mongolia on stage 2. The AIC values are 8.129414 and 8.136326 respectively, and the goodness of fit is 0.63.

Table 1 Weight of optimal control group for import volume growth rate（stage 1）

Variable	Coefficient	SE	t-Statistic	Prob.
Ningxia	0.059543**	0.025108	2.371466	0.0200
Shanxi	0.200978***	0.048905	-4.109595	0.0001
Yunnan	0.068629**	0.033962	2.020764	0.0465
Shandong	0.332950***	0.073375	4.537623	0.0000
Shaanxi	-0.071104**	0.031346	-2.268315	0.0259
Adj. R^2	0.634044	AIC	8.129414	

Note: ***, **, * represent that it is significant at 1%, 5%, 10% level

Table 2 Weight of optimal control group for import volume growth rate（Stage 2）

Variable	Coefficient	SE	t-Statistic	Prob.
Gansu	0.073511**	0.036212	2.030013	0.0465
Shanxi	0.165806***	0.056971	2.910341	0.0046
Yunnan	0.095459***	0.032346	2.951131	0.0041
Shandong	0.146504*	0.078274	1.871685	0.0648
Inner Mongolia	0.106728**	0.047068	2.267526	0.0260
Adj. R^2	0.631505	AIC	8.136326	

Note: ***, **, * represent that it is significant at 1%, 5%, 10% level

Table 3 and Table 4 are the weights of the optimal control group for the year-on-year growth rate of Guangdong Province's export volume. The year-on-year growth rate of export volume in the two stages can be well fitted by 8 provinces such as Jiangsu and 6 provinces such as Hainan. The AIC values are 7.334612 and 7.380007 respectively, and the goodness of fit is 0.71 and 0.69 respectively. In the above fitting process, the weight coefficient of the optimal control group is significant when the significance level is at least 10%.

Table 3 Weight of optimal control group for export volume growth rate stage 1）

Variable	Coefficient	SE	t-Statistic	Prob.
Jiangsu	0.512685***	0.079247	6.469487	0.0000
Guizhou	0.027120***	0.010150	2.671848	0.0091
Qinghai	0.018480*	0.010072	1.834767	0.0703
Hainan	0.048841**	0.024395	2.002085	0.0487
Anhui	0.062324**	0.025069	2.486129	0.0150
Gansu	0.026668***	0.008431	3.163129	0.0022
Heilongjiang	0.033916**	0.014454	2.346456	0.0214
Shaanxi	-0.102078**	0.042294	-2.413549	0.0181
Adj. R^2	0.708322	AIC	7.334612	

Note: ***, **, * represent that it is significant at 1%, 5%, 10% level

Table 4 Weight of optimal control group for export volume growth rate（stage 2）

Variable	Coefficient	SE	t-Statistic	Prob.
Jiangsu	0.432105***	0.071061	6.080728	0.0000
Guizhou	0.021419**	0.010204	2.099092	0.0389
Heilongjiang	0.027054*	0.014459	1.871065	0.0649
Hainan	0.056665**	0.023794	2.381529	0.0196
Anhui	0.068153***	0.025800	2.641553	0.0099
Gansu	0.020912**	0.008310	2.516600	0.0138
Adj. R^2	0.688373	AIC	7.380007	

Note: ***, **, * represent that it is significant at 1%, 5%, 10% level

(2) Obtain treatment effect

Using the weight of the optimal control group obtained above as the variable coefficient of the fitting regression equation, and then substituting the experimental data of the variables in the optimal control group into the regression equation respectively, we can get the out-of-sample forecast value of the growth rate of import and export volume of Guangdong Province, and the difference between the actual value and the predicted value is the treatment effect.

The results of treatment effect are shown in Table 5. After the establishment of Guangdong Free Trade Zone, the year-on-year growth rate of import and export of Guangdong Province show very obvious treatment effect: in the 37 months after the establishment of FTZ, the average treatment effect of the year-on-year growth rate of import volume is - 3.36%, of which 26 months is negative; while the average treatment effect of year-on-year growth rate of export volume is - 2.90%, of which 25 months is negative. FTZ has a negative effect on Guangdong Province's import and export.

Table 5 Treatment effect of the establishment of Guangdong Free Trade Zone

Period	Year-on-year growth rate of import volume (%)			Year-on-year growth rate of export volume (%)		
	Actual value	Predictive value	Treatment effect	Actual value	Predictive value	Treatment effect
201505	-14.66	-15.87	1.21	4.17	16.19	-12.02
201506	-1.58	-23.05	21.47	12.74	15.83	-3.09
201507	-3.92	-20.33	16.41	0.74	-6.28	7.02
201508	-6.85	-28.93	22.08	1.49	2.78	-1.29
201509	-32.41	-26.24	-6.17	-13.04	-1.13	-11.91
201510	-26.46	-21.18	-5.28	-7.60	-7.55	-0.05
201511	-3.70	-8.95	4.89	-1.59	4.37	-5.96
201512	-2.34	-3.51	1.17	-0.82	19.27	-20.09
201601	-17.79	0.02	-17.81	-4.55	-3.66	-0.89
201602	-14.63	-9.34	-5.29	-24.90	-7.09	-17.81
201603	-5.83	1.52	-7.35	9.10	6.26	2.84
201604	-6.68	-5.93	-0.75	4.51	4.78	-0.27
201605	-1.74	5.10	-6.84	-6.16	-8.00	1.84
201606	-7.56	15.22	-22.78	-8.73	-1.79	-6.94
201607	-14.82	-2.92	-11.90	-8.12	-7.84	-0.28
201608	-3.00	17.22	-20.22	-8.51	-2.12	-6.39
201609	7.19	13.31	-6.12	-2.24	-7.58	5.34
201610	2.84	13.30	-10.46	-6.71	-6.90	0.19
201611	-2.86	2.46	-5.32	-6.76	-4.68	-2.08
201612	-7.25	4.49	-11.74	-7.74	-8.00	0.26
201701	-4.32	9.20	-13.52	-1.28	3.22	-4.50
201702	27.39	23.41	3.89	-1.86	-3.64	1.78
201703	12.62	28.71	-16.09	17.19	2.78	14.41
201704	-1.65	13.29	-14.94	3.80	-3.67	7.47
201705	7.34	5.95	1.39	9.65	1.41	8.24
201706	10.38	8.02	2.36	5.92	9.84	-3.92
201707	4.99	12.97	-7.98	0.60	7.42	-6.82
201708	9.01	9.46	-0.45	-3.41	7.23	-10.64
201709	12.94	15.70	-2.76	2.70	11.67	-8.97
201710	8.96	12.50	-3.54	-1.08	6.76	-7.84
201711	9.31	15.44	-6.13	6.67	15.99	-9.32
201712	-2.73	8.11	-10.84	5.58	6.75	-1.17
201801	56.84	24.85	31.99	8.78	2.09	6.69
201802	4.78	15.07	-10.20	36.27	19.18	17.09

201803	19.13	19.49	-0.36	-9.42	2.38	-11.80
201804	18.60	17.92	0.68	-2.68	11.17	-13.85
201805	23.14	30.31	-7.17	-2.34	10.05	-12.39
Mean value of treatment effect	-3.36			-2.90		

In order to more intuitively reflect the treatment effect of the establishment of Guangdong Free Trade Zone, this paper uses the actual value, predictive value and treatment effect data of the year-on-year growth rate of import and export to obtain Figure 1 and Figure 2. As can be seen from the figures, the changing trend of treatment effect is very similar to the actual value, and the fluctuation of treatment effect is violently. In most of the time, the predictive value is higher than the actual value, and the treatment effect is basically negative, which indicates that the establishment of FTZ actually inhibits the growth of import and export.

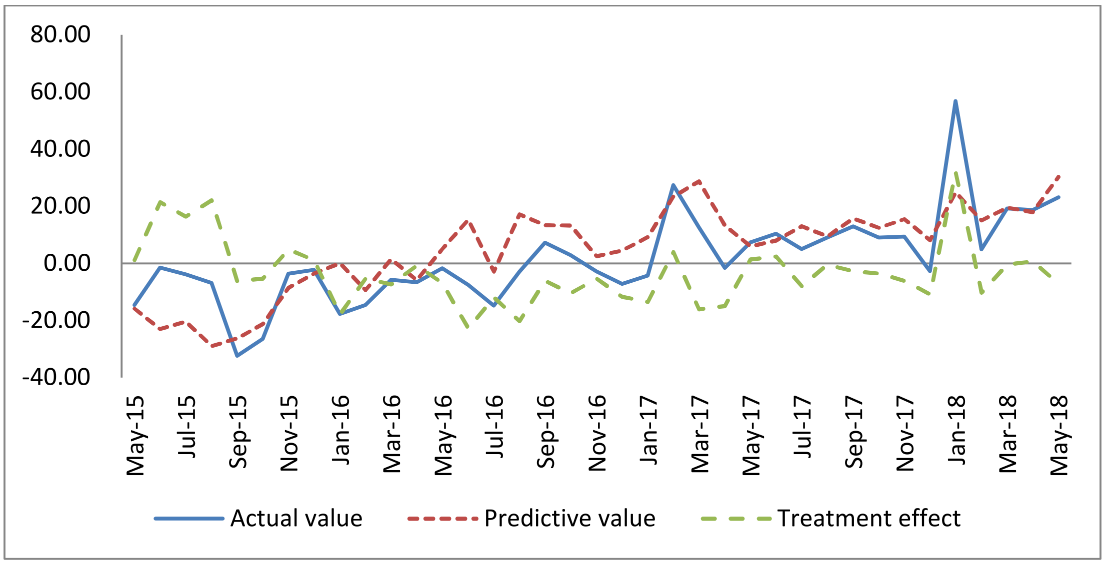

Figure 1 The actual value, predictive value and treatment effect of Guangdong's import growth rate in experimental period

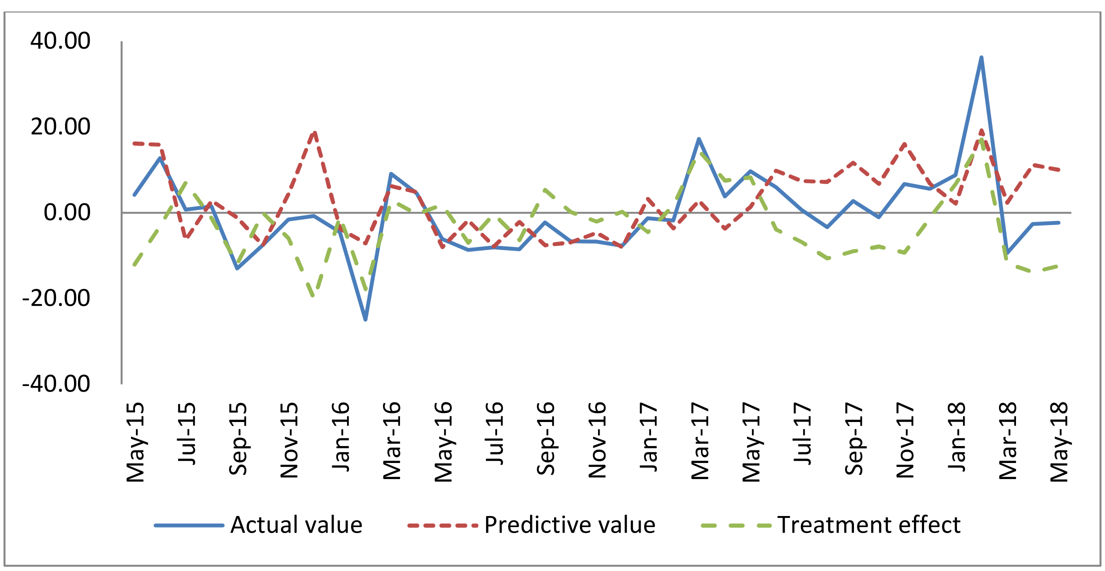

Figure 2 The actual value, predictive value and treatment effect of Guangdong's export growth rate in experimental period

(3) Robustness test

By changing the establishment time of Guangdong Free Trade Zone, this paper pushes forward the establishment time by one year, and then uses the corresponding data to fit to test whether the empirical results are stable and consistent. Specifically, assuming that the establishment time of Guangdong Free Trade Zone is April 2014, the year-on-year growth rate of import and export of Guangdong Province is fitted by using 76 periods of data from January 2008 to April 2014 in other regions, and then the counterfactual analysis is conducted on the data in the experimental period after obtaining the new optimal control group.

Figure 3 and Figure 4 show the actual value, predictive value and treatment effect of the year-on-year growth rate of import and export of Guangdong Province in the experimental period after the change. The dotted line in the figure shows the time point when the Guangdong Free Trade Zone was actually established. It can be seen that the changing trend of the treatment effect is basically consistent with the actual value, and the fluctuation is obvious; the predictive value is also higher than the actual value most of the time, and the treatment effect is negative. The average treatment effect of the year-on-year growth rate of import and export are respectively -18% and -3.23%, which are close to -3.36% and -2.90% obtained from the above empirical analysis. It can be seen that changing the establishment time of FTZ will not affect the empirical results. The results of robustness test are basically consistent with the results of empirical analysis, so the empirical results can be considered as robust.

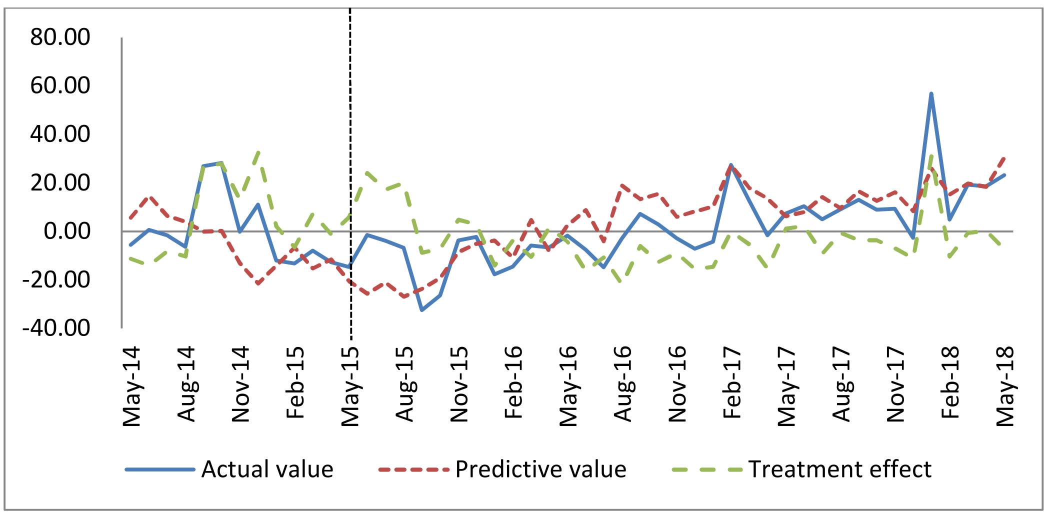

Figure 3 The actual value, predictive value and treatment effect of Guangdong's import growth rate after changing the experimental period

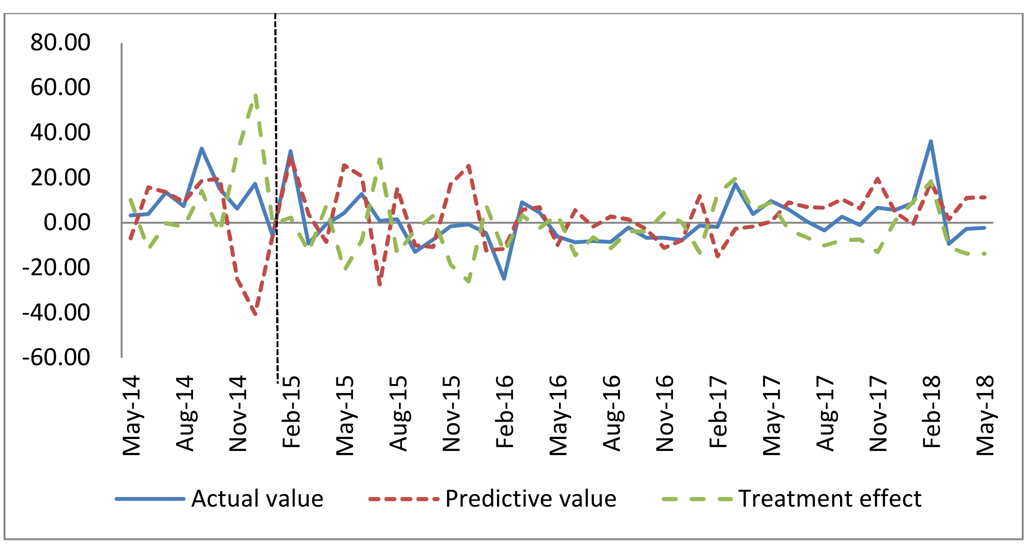

Figure 4 The actual value, predictive value and treatment effect of Guangdong's export growth rate after changing the experimental period

(4) Result analysis

The results of empirical analysis are different from most of the existing studies, mainly on Shanghai, but also inconsistent with the logic of the innovation of trade liberalization system. We try to explain this from the following aspects:

1) The effect of foreign trade facilitation policies in Guangdong Pilot Free Trade Zone is relatively low. The possible reasons are as follows: firstly, compared with Shanghai, the policy innovation of the second batch of pilot free trade zones has a certain marginal diminishing effect, weakening the positive effect considered in mechanism; secondly, the structural characteristics of industry and foreign trade may lead to less influence on the market and enterprises of Guangdong Pilot Free Trade Zone; thirdly, there are differences in the innovation of trade facilitation system, although the following FTZs in each batch has generally adopted Shanghai's "overall plan", but as a policy system, there are still some differences. Shanghai is still in the forefront especially in the specific and deepening innovation in various fields. The typical example is that Shanghai still takes the lead in introducing versions 2.0 and 3.0 in various fields. Finally, there are some differences in policy implementation, such as the implementation of "single window" and "opening up the first line and efficiently managing the second line" of the customs special supervision zone (bonded zone), which require a series of information and institutional support. For example, Shanghai Waigaoqiao Free Trade Zone is taking the lead.

2) At present, the spillover effect and synergy effect of FTZ on the surrounding areas, especially at the provincial level of Guangdong Province, are not strong. This is more consistent with our practical experience. At the same time, some studies think that because of the competition effect, FTZ may have a negative effect on the surrounding areas (Chen Qi and Liu Wei, 2014). This may be related to the imbalance of regional economic development in Guangdong Province. From the perspective of the promotion path and speed of institutional innovation in the FTZ, Guangdong may lag behind in this respect.

3) The volume of foreign trade cannot reflect the whole development of foreign trade. In fact, the trade structure of Guangdong Province has changed greatly during the observation period. The prominent performance is that the new business forms have been significantly developed. The system innovation of FTZ has a more prominent impact on cross-border e-commerce, parallel automobile and service trade, and plays a significant role in promoting the emerging business in the special customs supervision zone. Therefore, the possible result is that FTZ has led to the development of new formats and the improvement of trade structure, which cannot be fully reflected by the volume of foreign trade. Therefore, the analysis of trade structure is a direction of further research in the future.

4) The influence of Hong Kong and Macao Special Administrative Region. Hong Kong port is a large port in the world, especially as a famous free trade port, its level of trade facilitation has outstanding advantages compared with the mainland. For a long time, it has been an important import and export port for foreign trade in the Pearl River Delta, which can solve the problems of trade facilitation and customs clearance policy. Therefore, after the establishment of Guangdong Pilot Free Trade Zone, the effect of trade facilitation is not as obvious as expected by the mechanism.

5) Finally, counterfactual analysis may have limitations. The recently developed counterfactual analysis approach has been applied in the study of the system innovation of FTZ. However, as shown in this paper, the control group is mainly the central and western provinces. However, there is regional differentiation in China's foreign trade volume during the observation period. For example, in 2017, the foreign trade growth rate of 12 provinces and cities in the West was 23.4%, 9.2 percentage points higher than the national growth rate, and the foreign trade growth rate of 6 provinces and cities in Central China was 18.4%, 4.2 percentage points higher than the national growth rate. Therefore, the regional differentiation after the event may affect the prediction results.

5. Summary

Taking Guangdong Pilot Free Trade Zone as an example, this paper employs the counterfactual analysis approach to select the optimal control group to predict the counterfactual index after the establishment of FTZ, and compares the actual value with the predictive value to obtain the treatment effect. Based on this, the paper analyzes the specific impact of Guangdong Pilot Free Trade Zone on import and export respectively. The results show that the establishment of Guangdong Pilot Free Trade Zone has a significant inhibitory effect on both import and export, and the average treatment effect is - 3.36% and - 2.90% respectively.

The results are not in line with expectations, especially many estimates for Shanghai show positive effects. We analyze the possible reasons for this, including: the effect of trade facilitation policies in Guangdong Pilot Free Trade Zone is still relatively low; the spillover effect and synergy effect of FTZ on provincial level of Guangdong Province is not strong; the possible positive effects are mainly reflected in the trade structure and emerging formats; in addition, the use of counterfactual analysis approach needs to be further deepened.

The enlightenments of this paper are as follows: first, the main significance and role of FTZ is not reflected in "food production". If we focus on the construction of "experimental field", the short-term growth effect will not be obvious, and we should not worry too much about it; second, policy implementation, promotion and replication, and spillover effect are more worthy of attention; third, the research on FTZ needs to be deepened, such as the classification research in the field of institutional innovation, the quantitative refinement of policy text terms by the method of assignment, and the evaluation of performance and output needs to be more analyzed from the perspective of "development" and extended to the structural level, etc. These will be the direction of future research and development.

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