

# Research on the Influence of FTZ Policy on Regional Economy

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**Abstract:** China's free trade zone has achieved relatively mature development, showing a trend of extending from the east to the West. Current studies generally believe that the early establishment of the free trade zone will have a positive impact on the near area, so what about the establishment of the third inland free trade zone? In order to study its economic impact, this paper uses DID method to select the annual panel data of Chinese provinces, cities and autonomous regions from 2006 to 2018, from economic growth, foreign trade and freight volume, etc. This paper evaluates the economic effects of three free trade zones in the middle and upper reaches of the Yangtze River, namely, Sichuan, Chongqing and Hubei. According to the functional orientation of the three FTZ, the mechanism of the three FTZ is analyzed qualitatively. In terms of quantitative research, this paper uses the double difference method to analyze the differences in economy, trade and freight volume after the establishment of the free trade zone by analyzing the coefficients of policy variables and their significance. A robustness test was carried out on the impact of the post-policy implementation on the regional economy and foreign trade, and it was concluded that the three provinces had a positive impact on the regional economy and trade. Finally, relevant development suggestions are put forward.

**Keywords:** Free Trade Zone Policy, Middle and upper reaches of Yangtze River Economic Belt, DID, Counterfactual.

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## 1. Introduction

With the progress of economic globalization and the gradual strengthening of economic relations and trade dependence among countries, the global economic development process has slowed down, and China's economy has turned to high-quality development. In order to adapt to the new development status of international trade, seize the opportunity to meet the challenge, the free trade park policy has emerged and achieved gradual development. China is in the trend of the world, and it also learns from the experience of other countries' free trade zones, and implements policies to establish free trade zones based on its own reality, thereby bringing new impetus to reform and opening up, and bringing new vitality to economic development and foreign trade.

## 2. Literature References

Scholars have already started to study the economic effects of free trade zones a long time ago, and have given different answers to the question of how free trade zones can promote economic development. Krugman believes that the establishment of a free trade zone has played a role in attracting a large number of manufacturers and making them spatially concentrated. Therefore, it first expanded the scale of the market and accelerated capital accumulation, which not only promoted economic development, but also promoted foreign trade in the zone [1]. Barro and Martin, Ederington and Mc Calman focused on absorbing foreign advanced technological experience from the free trade zone [2]. Then, the positive economic utility of the free trade zone is explained from the perspective of driving economic development [3]. And some scholars (Hu and Liu) proved the role of free trade zones from the side: their research verified the effect of trade liberalization on the economy, and at the same time proved the positive impact of the establishment of free trade zones on trade liberalization, and then draw the conclusion [4]. Huang used the synthetic control method of

"counterfactual" comparative analysis to test the effect of the Shanghai Free Trade Zone policy and found that it promoted China's economic growth by enhancing the degree of trade freedom.

## 3. Analysis of Influence Mechanism

From a further point of view, we can explore how the establishment of a free trade zone can promote regional economic development from the perspective of the mechanism of action.

Institutional dividends and a superior business environment attract new enterprises to implement pre-entry national treatment and negative list management systems, lower the threshold for foreign trade, simplify licensing procedures and management requirements, and provide enterprises with overseas investment or overseas R&D. The convenience is very attractive to enterprises, which is conducive to improving the efficiency of enterprises in the free trade zone, reducing the cost of enterprises, and promoting the original local enterprises that were only engaged in export business to expand their business scope and increase import business according to the convenience, expanding the scale of foreign trade. Industrial development and structural upgrading drive enterprises to further develop agglomeration of high-tech industries and the convenience provided by the system has brought a guarantee for the development of high-tech industries in the upper and middle reaches of the Yangtze River Economic Belt, and can further promote the industrial structure of the central and western regions. Under the premise of rational allocation of resources, the products will be more high-end, more attractive and more competitive, thereby promoting the development of its regional economy and foreign trade.

Economies of scale provide convenience for enterprises' production transactions. Before the liberalization of foreign investment restrictions in Hubei, Sichuan, and Chongqing free trade zones, enterprises in many fields were restricted by industry entry barriers and were difficult to put into

production in large quantities due to institutional constraint, leading to the reduction of market competition. It is difficult to allocate resources efficiently, resulting in the problem of excessive pricing, waste of resources and reduction of purchases, and will inevitably lead to a situation of insufficient production scale. After relaxing the restrictions on the entry of foreign capital, there will be a large influx of foreign capital, which can stimulate enterprises in these fields to spontaneously cooperate or even merge in order to pursue higher interests, thereby achieving economies of scale. It can further reduce costs and improve efficiency, thereby improving competitiveness.

Radiation promotion has spillover effects on the economy of surrounding areas. After the establishment of the Hubei Free Trade Zone to promote the development of local economy and trade, it will become a new growth pole in the middle reaches of the Yangtze River, and the Sichuan and Chongqing Free Trade Zones will also become the Yangtze River after the good development. The new growth poles in the upper reaches, and thus play a role in pulling and radiating the economy of the middle and upper reaches of Yangtze river.

## 4. Actual Impact Results

Since the Hubei, Sichuan and Chongqing free trade zones were established in 2017, the end of 2016 was selected as the time point, and the time was divided into three years before and two years after its establishment, and the economic and trade conditions of the above three provinces were compared in the five years from 2014 to 2018, the economic and trade growth rate machines and their descriptions for each province are as follows.

In terms of economy, the GDP of Hubei Province maintained an upward trend. In 2018, that is, one year after the free trade zone, the GDP growth rate accelerated. GDP per capita also showed an upward trend, but the growth rate did not change significantly. The freight volume in Hubei Province has grown faster after the establishment of the free trade zone. In terms of foreign trade, both the total import and export volume and the growth rate of export volume in Hubei Province have shown an upward trend. In 2018, the import value of Hubei Province decreased significantly.

The growth rate of GDP and export value in Sichuan Province has shown a steady increase after the establishment of the free trade zone. However, after Sichuan's GDP per capita and freight volume maintained a relatively stable growth rate before 2017, the growth rate slowed down in 2018. In 2017, the growth rate of Sichuan Province's total import and export volume and import volume suddenly and sharply increased, indicating that the establishment of the free trade zone had a huge impact on its foreign trade growth. However, by 2018, its growth rate slowed down and its influence capacity was slightly weakened. From the numerical value, it can be seen that there was a stimulus in 2017, which made the growth rate of Sichuan Province's total import and export volume and import volume faster.

For Chongqing, the growth rate of its GDP and GDP per capita is relatively stable, but after the establishment of the free trade zone, its foreign trade has achieved great development. The growth rate of total imports and exports increased sharply, and the growth rate became more obvious after a period of lag. After a slight decline in 2017, the total value of exports rapidly increased to about sixfold in 2018, and the value of imports fell again after the increase. However,

in terms of freight volume, Chongqing Province grew faster in 2018.

To sum up, the economic indicators of the three provinces increased in 2017, but the indicators that were affected by the increase were different in each province.

## 5. Model and Data

### 5.1. Model

In order to identify whether there is an impact on the economy of the province, the establishment of free trade zones in Hubei, Sichuan and Chongqing in 2017 can be regarded as a natural experiment to the impact of local economic and foreign trade development. Under the premise of controlling other conditions unchanged, this method can be used to test whether the economic situation before and after the implementation of the policy is significantly different. For this, the following equations can be constructed:

$$Y_{it} = \beta_0 + \beta_1 DID_{it} + \beta_2 control_{it} + \eta_i + \gamma + \varepsilon_{it} \quad (1)$$

Among them,  $Y_{it}$  is the dependent variable, including the GDP, GDP per capita, industrial added value, total import and export, log value of import and export and freight volume, to measure the development of the economy and foreign trade of each province;  $DID_{it} = treated * post$  is the core predicted variable, In the sample, if a province (city, autonomous region) established a free trade zone in 2017, it is the experimental group, then  $treated = 1$ , otherwise  $treated = 0$ ; the control group is other provinces that have not established a free trade zone until 2017, the subscript  $i$  and  $t$  represent the province and year respectively. And  $control_{it}$  represents the control variable that affects the dependent variable and changes with time and province,  $\eta_i$  represents the fixed effect of each province, controls the individual effect of each province that affects the dependent variable but does not change with time,  $\gamma$  represents the period fixed effect, controls the effect of all changes over time.  $\varepsilon_{it}$  indicating the amount of error. The coefficient represents the policy effect of this paper, and if it is significantly positive, it means the policy is effective.

Since the policy may have a lagging effect, the following equation is constructed:

$$Y_{it} = \beta_0 + \beta_1 DID_{it+1} + \beta_2 control_{it} + \eta_i + \gamma + \varepsilon_{it} \quad (2)$$

Among them,  $DID_{it+1} = treated * post_1$ ,  $post_1$  is 1 when  $year = 2018$ , otherwise takes 0, other variables are the same as the model (4.1). If  $\beta_1$  is significant, it means that the policy has a lag effect, that is, after the corresponding lag period of the establishment of the free trade zone, it will have a significant impact on the province's economy and foreign trade.

### 5.2. Variable selection

**Table 1.** The Selection and Description of Variable

Type	Name	Meaning	Calculation
Predicted variable	<i>gdp</i>	logarithm of GDP	lnGDP
Predicted variable	<i>pgdp</i>	logarithm of per capita GDP	lnPGDP
Predicted variable	<i>tra</i>	logarithm of imports and exports	ln(import+export)
Predicted variable	<i>ex</i>	logarithm of exports	lnexport
Predicted variable	<i>im</i>	logarithm of imports	lnimport
Predicted variable	<i>hy</i>	Logarithm of freight volume	lnfreight
Predicted variable	<i>treated</i>	Whether to implement the free trade zone strategy	virtual variable(0, 1)
Predicted variable	<i>post</i>	Whether the year is greater than or equal to 2017	virtual variable(0, 1)
Predicted variable	<i>post1</i>	Whether the year is greater than or equal to 2018	virtual variable(0, 1)
Predicted variable	<i>fin</i>	Government spending compensation coefficient	(Financial Revenue/Financial Expenditure)*100
Predicted variable	<i>edu</i>	Education level of residents	(Number of college students/population)*100
Predicted variable	<i>gov</i>	level of government development	(Government revenue/GDP)*100

### 5.3. Data Sources

According to the principle of easy selection and processing, this paper selects the panel data of each province from 2006 to 2018, takes 18 provinces that have not established free trade zones as of 2017 as the control group, and Sichuan, Hubei, and Chongqing as the experimental group. Among them, provinces in the middle reaches of the Yangtze River include Hubei, Hunan, and Jiangxi, and provinces in the upper

reaches of the Yangtze River include Sichuan, Chongqing, Tibet, Qinghai, and Yunnan, and other provinces are not in the Yangtze River Economic Belt. The data comes from China Economic Data, China Customs data and provincial statistical yearbooks.

## 6. Results

### 6.1. Results

**Table 4.** The Selection and Description of Variable

	<i>gdp</i>	<i>pgdp</i>	<i>tra</i>	<i>im</i>	<i>ex</i>	<i>hy</i>
<b>DID</b>	0.1662***	0.5122***	0.5807***	0.5089***	0.5957**	0.0796
	(0.0483)	(0.1383)	(0.1691)	(0.1703)	(0.2356)	(0.1154)
<b>R2</b>	0.9943	0.9062	0.9745	0.9468	0.9628	0.9807

It can be seen from the above table that, under the control of individual effects and time effects, the establishment of a free trade zone has a significant positive effect on the province's GDP, per capita GDP, total import and export and import volume at the 1%

significance level. At the 5% significance level, there is a positive effect on the province's export value; but there is no significant effect on the freight volume.

**Table 2.** The empirical results after a period of lag

	<i>gdp</i>	<i>pgdp</i>	<i>tra</i>	<i>im</i>	<i>ex</i>	<i>hy</i>
<b>DID</b>	0.8867***	0.1417	0.6396***	0.4288	0.7962**	0.0670
	(0.2860)	(0.0894)	(0.1673)	(0.2677)	(0.3053)	(0.1126)
<b>R2</b>	0.9110	0.9963	0.9738	0.9459	0.9627	0.9807

After a period of lag, the regression results shown in the table above are obtained. After a period of lag, the establishment of a free trade zone has a significant positive coefficient on GDP, total import and export volume and export value, and the coefficients are all larger than those in the year of establishment. However, after a period of lag, the natural experiment of establishing a free trade zone has no significant impact on per capita GDP, import value and freight volume.

### 6.2. Robustness Check

The data of the experimental group and the data of the control group are plotted over time, and the results are as follows:

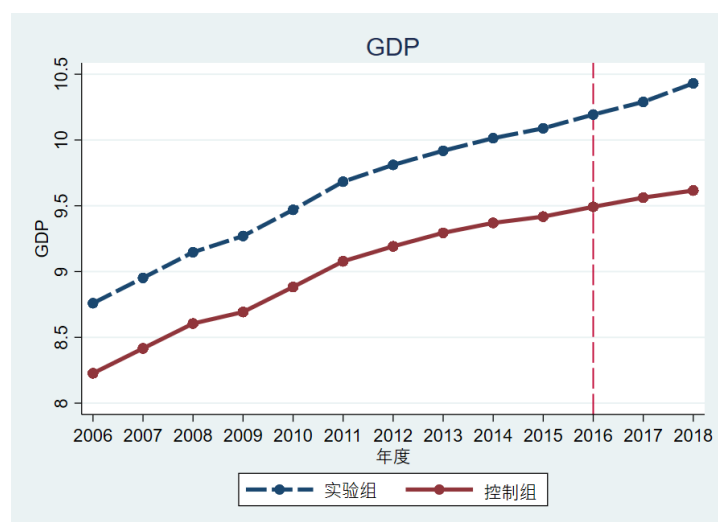


Figure 1. Results of robustness check

As shown in the figure, before the implementation of the policy, the gap between the experimental group and the control group did not change significantly, and after the experiment, that is, on the right side of the dotted line, the gap between the two widened, satisfying the common trend hypothesis. Afterwards, assumptions are made for other variables and other variables of spillover effects, and the variables all satisfy the common trend assumption.

## 7. Conclusions and Suggestions

### 7.1. Conclusions

This paper takes the establishment of free trade zones in Hubei, Sichuan and Chengdu as the research objects. Based on the annual data of each province from 2006 to 2018, using the double difference method and composite control method to measure policy effects, the following results are obtained after testing: Regional policies can have a positive effect on local economic development. However, due to the different economic nature of provinces and the strategic positioning and development priorities of free trade zones, the effects of the establishment of free trade zones on different provinces and regions are significantly different.

According to the results of the double difference, after the establishment of the Hubei, Sichuan and Chongqing free trade zones, the local economy (GDP and per capita GDP) and foreign trade (total import and export, import and export) have increased significantly. This shows that the establishment of the free trade zone has promoted the economic and trade development of these three provinces. However, in terms of freight volume, the establishment of the free trade zone has not seen a significant impact.

After one lag period, the positive impact on GDP, total import and export value and export value has increased, while the effect of per capita GDP, import value and freight volume has weakened after one lag period, and the impact is no longer significant. The reason may be that in the early days of the establishment of the free trade zone, the implementation of policies may take a period of time, and it will take some time for the open implementation of economic policies and mechanisms to attract enterprises and stimulate the economy. For the import value, in the early days of the establishment of the free trade zone, the economic benefits caused by the policy were strong, and the import value increased rapidly and rapidly. After one year, the growth rate slowed down or even

the correlation coefficient was no longer significant. in line with current economic conditions.

### 7.2. Suggestions

And in the lag year, other provinces in the control group also established their new free trade zones, so it may reduce the gap between the control group and the experimental group, so the effect of the policy will be reduced.

Based on the above conclusions, the following suggestions are drawn:

(1) Firmly promote the construction strategy of the free trade zone, and promote the development of regional economy and foreign trade. The free trade experimental zone can promote the economic development of the province by relying on the loose conditions and good trade environment provided by the state. Rationally allocate resources, accelerate industrial upgrading, attract foreign investment, and promote import and export trade. The establishment of the Hubei, Sichuan and Chongqing free trade zones has a relatively significant role in promoting regional economy and foreign trade. Therefore, we should firmly develop the free trade zone construction strategy, make good use of relevant policies, and play a role in promoting the economy together with strategies such as the rise of the central and western regions a huge boost.

(2) Increase policy support and improve the competitiveness of the middle and upper reaches of the Yangtze River. On the other hand, each region should improve the level of infrastructure and continue to provide policies that are attractive to foreign investment and local enterprises, so that the attracted enterprises can make full use of the local area. The advantages and resources of each province will lead to an industrial layout with high efficiency and high utilization rate, and promote the rational allocation of factor resources in the region, making the provincial free trade zones become new engines for economic development and foreign trade. It is necessary to increase support for the free trade zone policy and maintain its good economic effect.

(3) Strengthen the regional economic connection of the Yangtze River Economic Belt and enhance the spillover effect of the free trade zone policy. Hubei Province, Sichuan Province and Chongqing Municipality should make good use of their role as the western free trade zone, make good use of their radiation effects, and rely on the Yangtze River Economic Belt. The good location advantage of the east, and

the experience of the eastern free trade zone will be used to promote the development of the western provinces and cities. It is necessary to increase the absorption of the excellent experience in the east and the high-quality resources in innovation and management from the world, and combine with its own conditions to form a cluster of its own advantages, but also strengthen the connection with surrounding provinces and cities. The excellent experience and advantageous resources gathered in the free trade zone of the province radiate to the surrounding provinces and cities.

At the same time, it is also necessary to innovate and strengthen the transmission mechanism between the free trade zone and other provinces in the Yangtze River Economic Belt, so as to better play the linkage role of the Yangtze River Economic Belt, that is, the geographical advantage across the east and west, and form a radiation of experience from the east to the west pattern. As the free trade zones of Hubei, Chongqing and Sichuan in the middle and upper reaches of the Yangtze River, relevant policies should be introduced to guide the flow and radiation of high-quality resources in the provinces and cities near the Yangtze River Economic Belt. Its own economic and trade development, and then give full play to the economic and experience-driven role of the free trade zone not only for the local area, but also for nearby cities in the economic belt.

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