Bachelor Thesis

How does the establishment of SEAs influence the export of the areas in China?

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1 Introduction

Special Economic Areas (SEAs) are geographic regions which are normally characterized with more flexible laws and special policies concerning investments in SEAs, compared with the regular areas of cities. In 1979, as China's emphasis changed to rapid economic modernization, two southern coastal provinces of Guangdong and Fujian were first picked as candidates of SEAs. In the following years, more cities were added to the list. Then, until 2006, there had been 105 SEAs across the mainland most of which locate in east coastal areas, especially the 3 biggest urban agglomerations, Beijing-Tianjin-Hebei Region, Yangtze River Delta and Pearl River Delta[1]. These three urban agglomerations contribute to the major China's economic growth

Economically, SEAs contribute to the rapid growth of GDP with the help of foreign investments, including their advanced technologies and management experiences (Zeng, 2010). According to Zeng, in 2006, the initial five SEZ cities (Shenzhen, Zhuhai, Shantou, Xiamen and Hainan) had already contributed to 5% of the GDP, 22% of the export and 9% of the FDI inflow. The total GDP of the majority of the state-level SEAs (including the SEZ cities, ETDAs, HTIDAs, and BAs) would account for about 18.5 percent of China's total GDP and about 60 percent of total exports. So SEAs have an important role in the economic development of China.

The success of China's SEAs is attributed to some factors. The first one is the strong commitment of the government with respect to reform of economy. Facing high uncertainty at the beginning of reform, the leaders provided a stable and supportive macroeconomic environment, which is, complete different from the previously planned economy. Second, a few preferential policies and favorable policies are issued to attract investments, especially foreign investments. The third one is the ability of learning, innovation of companies in SEAs. They adopt advanced technological and managerial experiences to keep pace with excellent enterprises (Zeng, 2010).

There are also some challenges encountered by SEAs during the development. For instance, even with respect to the development of high technology and innovation industries, somehow,

[1] There are 10 cities in Beijing-Tianjin-Hebei Region: Beijing, Tianjin, Shijiazhuang, Tangshan, Baoding, Qinhuangdao, Langfang, Cangzhou, Chengde and Zhangjiakou. There are 16 cities in Yangtze River Delta: Shanghai, Nanjing, Hangzhou, Ningbo, Suzhou, Wuxi, Changzhou, Zhenjiang, Yangzhou, Taizhou, Nantong, Jiaxing, Shaoxing, Huzhou, Zhoushan and Taizhou. Pearl River Delta is consisted by 9 cities: Ganghzou, Shenzhen, Zhuhai, Foshan, Huizhou, Zhaoqing, Jiangmen, Zhongshan and Dongguan.

cheap labor and low cost of pollution post-treatment remains the dominant advantages for SEAs' manufacturing industry. As a result of that, many cities there face severe environment situations. Thus, environment concerns were taking into consideration in the further development of SEAs after that.

There are several papers analyzing the development of SEAs in China. For example, Jin Wang (2009) analyzed the benefits of FDI brought by SEAs in China. And Zhihua Zeng (2011) did one study about how SEAs and industrial clusters drive China's rapid development. These authors analyze the influences of SEAs at a broad level. Only a few researches are about the influence of SEAs on the export, for instance, the study of export performance of SEAs in India (Lonarkar, Pramod and Deogirikar, 2012). India and China are two important developing countries, who both regard export as a crucial way to boost GDP. China already becomes the biggest exporter in the world (Inman, 2010). So analyzing the export of SEAs in China is important.

It is found that the economic gap of cities with SEAs and cities without SEAs is becoming larger (Zhang, 1992). Cities with SEAs develop better. So the SEA is not only a relocation of activities, but a real development of the whole city, in particular driven by the activity in the SEAs. Export is the main activity in SEAs. Preferential policies in SEAs, including exemption and reduction of tax and tariff, help to lower costs of products, which contributes to the increase of the export. So it remains a question whether the export of SEAs has overwhelming advantages over the regular areas. However, there still remains no empirical study to analyze the problem. In this paper, I will analyze how the establishment of SEAs influences the export of the economic areas using statistical evidence. This paper chooses areas of individual cities as the object of the study to test how the SEA influences the export locally.

The paper is investigated on the data of the export in different cities from 1997 to 2006. The export is summarized according to which kind of areas it belongs to. If one area does not belong to a specific SEA, the export of it will be set as a part of the regular area. Thus a comparison of the export between SEAs and regular areas can answer the study question.

The paper is constructed as follows. Section 2 will introduce some studies of SEAs in several countries. Section 3 will demonstrate some background of SEAs. Section 4 will introduce the methodology and present descriptive statistics of data. Section 5 will present the results of

models. Section 6 will discuss the reasons behind results. Final part is the conclusion and suggestions of the further research.

2 Literature review

Goals and policies for the SEAs vary from country to country, which lead to different results. Some researchers have analyzed the performance of SEAs in several countries.

According to Aggarwal (2007), India's economic areas have been regarded as an important role in creating employment and reducing poverty. Normally, export promotion is regarded as main driving force of economic growth in developing countries. For example, in India, the gross exports, foreign exchange earnings of economic zones increased in absolute terms. However, their growth rates decreased substantially. Meanwhile, the economic areas failed to develop promote nontraditional exports[2]. The undesirable results are attributed to several reasons, including dysfunctional policies, poor attitudes of the officials and poor infrastructures (Aggarwal, 2004).

In Poland, the SEA was initially set as a form of national support to some sites and regions (undeveloped areas). However, it is found that the investments revised the initial objective of SEAs. This is because such regions can't compete with those developed ones due to less attractive to investors. (Gwosdz, Jarczewski & Huculak, 2008).

As a type of SEA, the free area gained great success in Honduras, especially from 1997 to 2006. The study of Farole and Akinci (2011) concludes that the incentives for foreign investors are that they don't need to pay all federal and municipal taxes, duties and charges when they operate trades. A unique incentive of the free area in Honduras is no time limit on the fiscal incentives. However the free area in Hoduras is faced with challenges. For example, the free area in Honduras lacks the diversification of goods. The coverage of the free areas is also limited. So the free area needs to be uprated to overcome these shortcomings for further development.

In the case of Africa, several incentives have been issued, to help development of SEA region, including Kenya's 10-year tax holiday, Egypt's permanent tax exemption and the 15 % tax rate

[2] Traditional sectors namely electronics and gems and jewellery

applicable in Mauritius (Ampah&Nyagah, 2010). But the incentives didn't bring expected results. The study found that several factors caused it, including the poor strategic planning, weak area management, poor quality job provision, low wages and disappointed infrastructure development (Narrainen & Charitar 2009).

3 Background of Special Economic Area experiment review

In China, the SEAs can normally be classified into 4 main types, SEZ cities[3], ETDA (Economic and Technological Development Area), HTIDA (High-Tech Industry Development Area) and BA (Bonded Area). Only a few cities are set as SEZ cities. Most cities only have certain areas set as SEAs.

The establishment of high-tech industrial development areas (HTIDA) is to implement the Torch Program proposed in the late 1980s. The main objective of the program was to use the technology and knowledge resources of higher-education institutes and medium/large enterprises to develop new and high-tech products and to accelerate the commercialization of research and development (Zeng, 2011). Up to 2006, 47 HTIDA were constructed across China.

The development direction of ETDA is the technology-intensive industry. The primary mission of ETDA is to attract advanced technology and management skills, enlarge exports and increase foreign exchange earnings etc. A greater number of ETDZs locate at cities along the east coast which have intensive transportation links and better developed industrial foundation. So ETDA interact with foreign markets actively.

A bonded area in China is a special area where products are manufactured, stored, or manipulated without payment of duty. It has the similar function of the free trade area. What's more, the bonded area not only emphasizes the development of export-oriented economy, but also Internal-oriented economy. So the policies of the bonded area encourage both the free trade with overseas and the expansion of the home market.

In 1980, the first four SEAs were established for small-scale experiment of market-oriented economy, aiming at attracting overseas investment. They were Shenzhen, Zhuhai, Shantou and Xiamen. These four SEAs were near Hong Kong, Macao and Taiwan. Hong Kong was the only

[3] The large parts/whole city or province is set as the SEA.

modern port at that time, having broad access to the global shipping network. The four SEAs were encouraged to implement practical and open economic policies that would were set as a test for preferential policies. If these policies would be proven successful, they would be wildly applied across China.

Fortunately the result was satisfactory. The SEA model was successful and then was spreaded. In 1984, 14 coastal port cities, from the Dalian to Beihai, were set as SEAs. Enjoying the advantages of the location, the development of the modern port was triggered quickly, which contributed a lot to the export. The SEA was gradually expanded to the Yangtze River Delta, the Pearl River Delta. The development of manufacturing clusters was driven in these two Deltas.

In 1988, Hainan Province was set as a SEA. It mainly develops the touristic and agribusiness sectors. Now the province has become an important tourist destination in China. In the following years, special economic areas were divided from the city itself and set as SEAs across the whole China. Most SEAs aggregate in the coastal provinces. Only a few SEAs were built in interior provinces because of the weak accessibility to port and foreign markets.

In 1992, the State Council continually established extra 35 ETDZs. By doing so, they planned to extend the ETDZs from the coastal cities to inland regions and to focus more on more on technology-intensive industries rather than fundamental industries. Inland regions are less developed compared with coastal cities. The basis of fundamental industries in inland regions is weak. Developing new and high-technology industries is more suitable for inland areas. By the end of 2008, there were 54 state-initiated ETDAs. By April 2010, ETDAs increased to 69: 18 in the Yangtze River Delta, 10 in the Pearl River Delta, 15 in the central region, 11 in the Bohai Bay region, 13 in the western region, and 2 in the northeast region (Zeng, 2010).

To encourage firms to invest in SEAs, numerous preferential policies were taken in place. The law of SEAs provides the following four main preferential policies for investment:
1) Tax incentives: Manufacturing companies in SEAs are normally granted a tax rate reduction of 15% on corporate income tax, with full tax exemption in the first two years and a 50% tax reduction during the following three years. Foreign invested service companies and banks can also have tax concessions but they are subject to special regulations in these areas (Ernst & Young, 2007).

2) Human resources: People with their family, are granted to settle in the city as registered residents if they are high-tech talents or with diploma from higher education, mid- to senior-level professional titles, and important patents. Furthermore, the local government will subsidize for their work and award for their contribution. (Zeng, 2010).

3) Land use policy: In Chinese law, the ownership of all lands belongs to the state. Foreign investors are granted to obtain the rights of using lands. They are also allowed to transfer and lease rights of using lands, or put them up for mortgage in accordance with the requirements of laws. Certified export-oriented and high-tech enterprises only need to pay half of the industrial land-use fees for the first five years. In addition, high-tech companies, research projects, and production sites are exempt from transaction fees for the transfer of land-use rights, registration fees, trading fees etc. (Zeng, 2010)[4].

4) Private Property Rights Protection: the SEAs encourage foreign citizens, overseas Chinese, investors from Hong Kong and Macau and their companies and enterprises to set up business in China or develop joint ventures with Chinese. The SEAs guarantee to protect their private property rights and other rights in accordance with the laws. It is a very important commitment by the Chinese state government since there was no constitutional protection of the private property rights until recently except SEAs (Wang, 2009)

In addition, the SEAs are entitled to great political and economic autonomy. They are granted to develop laws and regulations as long as they ensure the basic lines of national laws and regulations. For instance, SEAs can set local tax rates and structures. Previously only the National People's Congress, its Standing Committee, provincial-level People's Congress and its Standing Committee had the legislative power. The freedom and support promised by the government is an important factor determining the success of SEAs.

Shenzhen is a great success as a SEZ city, which benefits from the political and economic autonomy. In 1981, it was granted the same political status as Guangzhou, the capital of Guangzhou Province. In 1992, it was granted by the state government to have the legislative power. Enjoying that great autonomy, Shenzhen issued several advance laws and regulations at that time. For example, Shenzhen adopted a minimum wage and the best social insurance package in China (Sklair, 1991).

[4] This is the land use policy in Shenzhen.

4 Data

The data source is from Chinese Customs, providing information on Chinese export based on location, year, and types of products from 1997 to 2006. About 405 prefecture cities are incorporated (The quantity fluctuates weakly across years). The SEAs used in this paper are initiated by the central government. SEAs which are administered under local government are excluded from the analysis. From 1997 to 2006, the number of SEAs increased from 91 to 105.

The dataset contains information on the total yearly exports of regular areas and SEAs (including SEZ cities[5], ETDA, HTIDA and BA) of each city. An identification code is assigned to every SEA and regular area of cities respectively. Besides, each type of area has its own code to distinguish among HTIDA, ETDA, BA, and the SEZ city.

5 Empirical methodology and descriptive statistics

5.1 Empirical methodology

The main econometric model applied in this paper is the fixed effect model of panel data. So only the predictors' net effects are assessed. Besides, the standard errors are clustered. One basic assumption of the linear regression is the independence of error terms, but this is violated in many cases. A natural generalization is to assume "clustered errors" i.e. accounting for the intraclass correlation

The data of four municipalities are excluded from the analysis of hypothesis 1 and hypothesis 3 since they contain very many different SEAs and thus considered to be very different from the other cities. Simple models will be developed to assess my four main hypotheses. The logarithm of the export ln(export) is set as the dependent variable:

***Hypothesis 1*: the export of SEAs is higher than the export in the rest part of the city.**
SEAs have more flexible laws and preferential policies, which entitle the SEAs great advantages of the export over regular areas. Therefore, exports are likely to be higher in these areas.

$$\ln(export_{izt}) = \alpha + \beta_k * SEA * Y_j + city_i + \varepsilon_{izt} \quad (1)$$

where j=1997, 1998, …, 2006

[5] Here the SEZ cities incorporate ETDA, HTIDA and BA.

α is the constant term. Here i stands for one specific city and z represents the specific area. In this regression, z has two types: SEA (including SEZ cities, ETDA, HTIDA and BA) and regular areas. t represents one specific year. So $export_{izt}$ is the export of one type of areas of one specific city in one specific year. SEA is the area dummy which will take value 1 when z is the SEA. Otherwise it will take value 0. Y_j is the year dummy. β_k is the coefficient of interaction term of SEA*Y_j. The regression includes also $city_i$, which is a city fixed effect. This controls for the time invariant characteristics of every city, such as the city size. ε_{izt} is the error term

***Hypothesis 2*: The export of SEAs in Beijing-Tianjin-Hebei Region is lower than that in Yangtze River Delta and Pearl River Delta**

This is expected for that Beijing-Tianjin-Hebei Region is less developed than the other two city agglomerations.

$$\ln(export_{izt}) = \alpha + \beta_k * SEA * Y_j + \lambda_k * SEA * Y_j * dYangtze + \gamma_k * SEA * Y_j * dPearl + city_i + \varepsilon_{izt} \quad (2)$$

where j=1997, 1998, …, 2006

Because this hypothesis is based on the three city agglomerations, the three municipalities (Beijing, Tianjin and Shanghai), which are important cities in the agglomerations, are included. i, z, t and SEA, Y_j and $export_{izt}$ share the same meaning with those in hypothesis 1. dYangtze is a dummy variable which will take value 1 when the economic area belongs to Yangtze River Delta. If the area is in other two city agglomerations, dYangtze will take value 0. Similarly, dPearl is a dummy variable which will take value 1 when the area belongs to Pearl River Delta. Otherwise, it takes value 0. β_k is the coefficient of interaction term of SEA*Y_j. λ_k is the coefficient of interaction SEA*Y_j*dYangtze. And γ_k is the coefficient of interaction SEA*Y_j*dPearl. $city_i$ is the city fixed effect. ε_{izt} is the error term

***Hypothesis 3:* ETDA has higher export than HTIDA.**

This is expected because one goal of ETDA is increasing the export, which is not the main goal for HTIDA.

$$\ln(export_{izt}) = \alpha + \beta_k * ETDA * Y_j + city_i + \varepsilon_{izt} \quad (3)$$

where j=1997, 1998, …, 2006

The data of regular areas is dropped from the analysis because this model only compares between ETDA and HTIDA. α is the constant term. i also stands for one specific city and z represents the specific economic area. In this regression, z has two types: ETDA and HTIDA. t represents one specific year. So $export_{izt}$ is the export of one type of economic areas of one specific city in one specific year. ETDA is an economic area dummy which will take value 1 when z is the ETDA. It will take value 0 when the economic area is HTIDA. Yj are year dummies. β_k is the coefficient of interaction term of ETDA* Y_j. $city_i$ is still city fixed effect and ε_{izt} is the error term

***Hypothesis 4*: The export of ETDAs in Beijing-Tianjin-Hebei Region is lower than that in Yangtze River Delta and Pearl River Delta**

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This is expected for that Beijing-Tianjin-Hebei Region is the least developed area among these three city agglomerations. Yangtze River Delta and Pearl River Delta are two regions famous for exports in China.

$$\ln(export_{izt}) = \alpha + \beta_k * ETDA * Y_j + \lambda_k * ETDA * Y_j * dYangtze + \gamma_k * ETDA * Y_j * dPearl + city_i + \varepsilon_{izt} \quad (4)$$

where j=1997, 1998, …, 2006

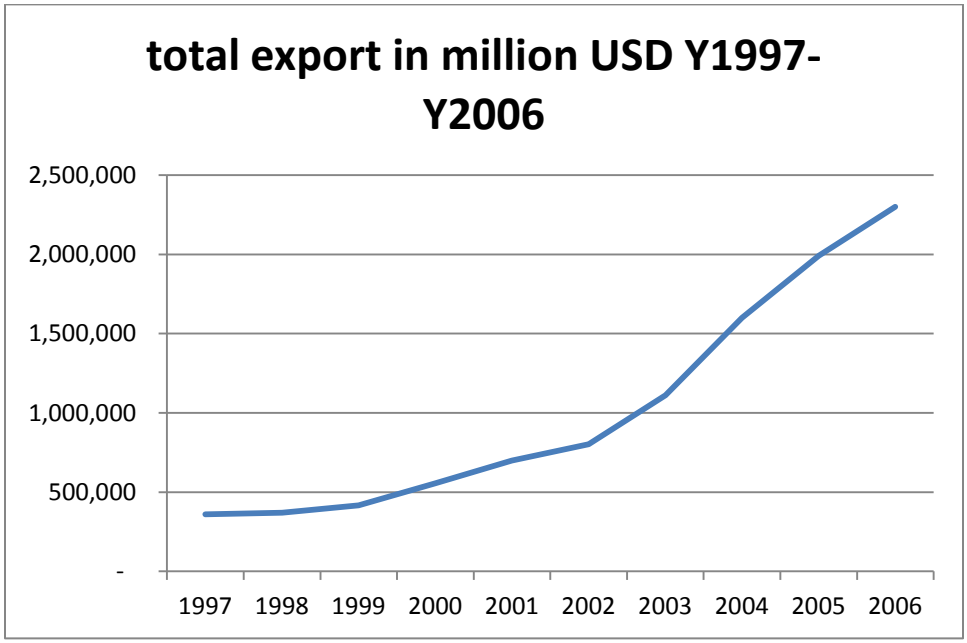
Like hypothesis 2, three municipalities are added back and the data of regular areas is dropped. α is the constant term. i, t, and Yangtze and dPearl share the same meanings with hypothesis 2. z has two types: ETDA and HTIDA. ETDA is the economic area dummy which will take value 1 when z is the ETDA. It will take value 0 when the economic area is HTIDA. $export_{izt}$ is the export of one type of economic areas of one specific city in one specific year. β_k is the coefficient of interaction ETDA*Y_j. λ_k is the coefficient of interaction ETDA*Y1998*dYangtze. And γ_k is the coefficient of interaction ETDA *Y1998*dPearl. $city_i$ is the city fixed effect. ε_{izt} is the error term

5.2 Descriptive statistics

From 1997 to 2006, the total export of China increased dramatically, especially in more recent years. It can be seen that the number of export grows from 361,000 million USD to 2,300,000 million USD. It is a common perception that the SEAs and the favorable exchange rate promoted Chinese exports in these years. In 2001, China entered WTO, which helped China

open up for more international trade. This is an important event that also makes the export take off.

Graph 1: Total export in China (in Million USD) Y1997-Y2006



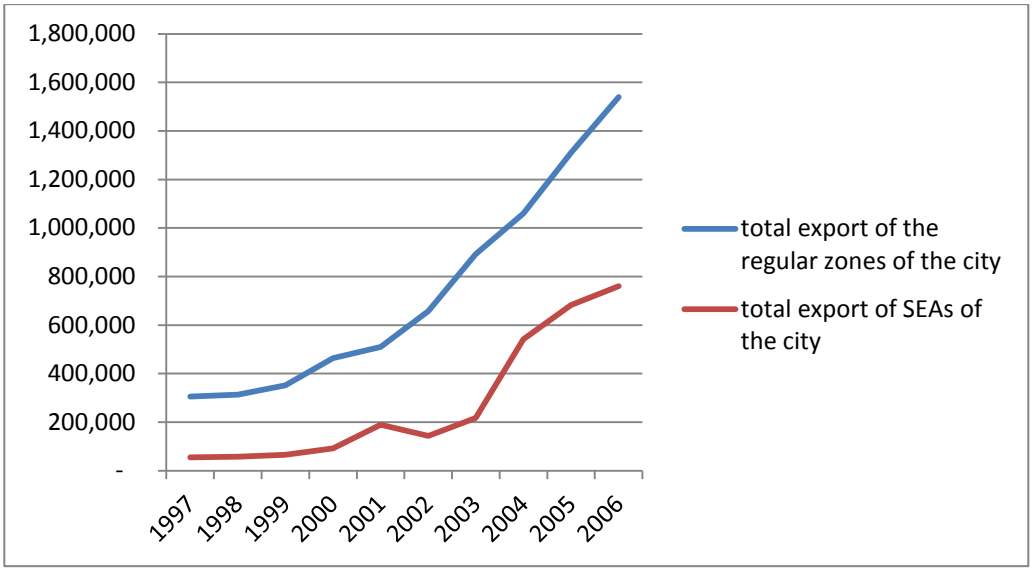
From 1997 to 2006, different types of SEAs were established. In 2006, there are 70 of SEA cities, 216 of ETDA, 461 of HTIDA, 109 of BA and 4064 of regular areas (see Table 1). The quantity discrepancy among types of SEAs is attributed the development procedure of SEAs. The reason is that at the introduction of the SEAs, only a few cities had set as SEA cities. Then ETDA was introduced, which was expanded widely across China. In the following years, due to the adjustment of SEAs, more SEAs with specific functions were constructed, which are HTIDA and BA. HTIDA is more welcomed by most cities. So the observations of BA are fewer than SEA and BA.

Table 1 numbers of different types of SEAs and regular areas in Y2006

SEA	Fre	Percent
SEZ cities	70	1.42
ETDA	216	4.39
HTIDA	461	9.37
BA	109	2.33
Regular areas	4,064	82.6
Total	4,920	100

For the total export of the SEAs in China, it increased from 55,400 million USD in 1997 (91 SEAs) to 761,000 million USD (105 SEAs) in 2006. For the total export of regular areas, it went up from 306,000 million to 1,540,000 million USD[6]. In 1997, the total export of regular areas is 5.5 times of that in SEAs. However, the magnitude declines to 2 in 2006 when the number of SEAs is just increased by 14 (Appendix Table 6). It can be seen that the export in SEAs increases dramatically.

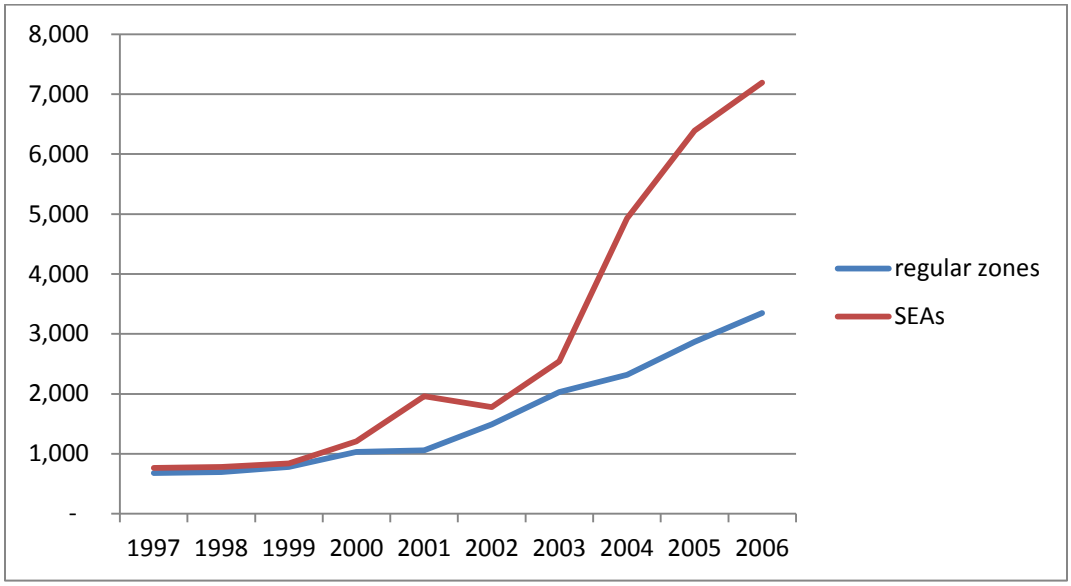
Graph 2: **Total export of regular areas and SEAs (in Million USD) Y1997-Y2006**



Graph 3 shows that although the total export of SEAs is always below the total export of regular areas, the average export of SEAs is always higher than the average export of regular areas. And the difference of the mean export between the two types of areas is becoming larger over the ten years.

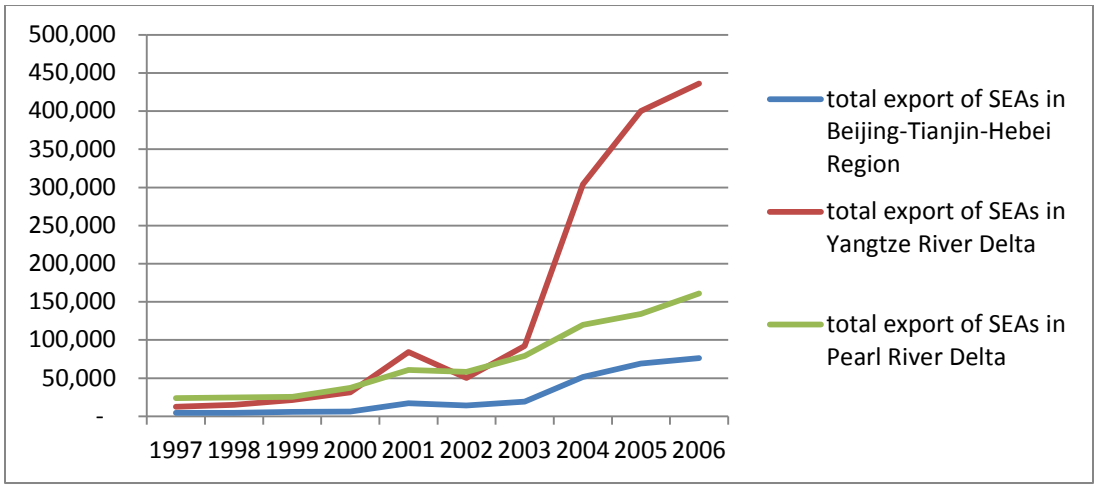
[6] Here the observations includes the four municipalities directly under the central government
[6](Beijing, Shanghai, Tianjin and Chongqing)

Graph 3: Average export of SEAs and regular area (in million USD) Y1997-Y2006



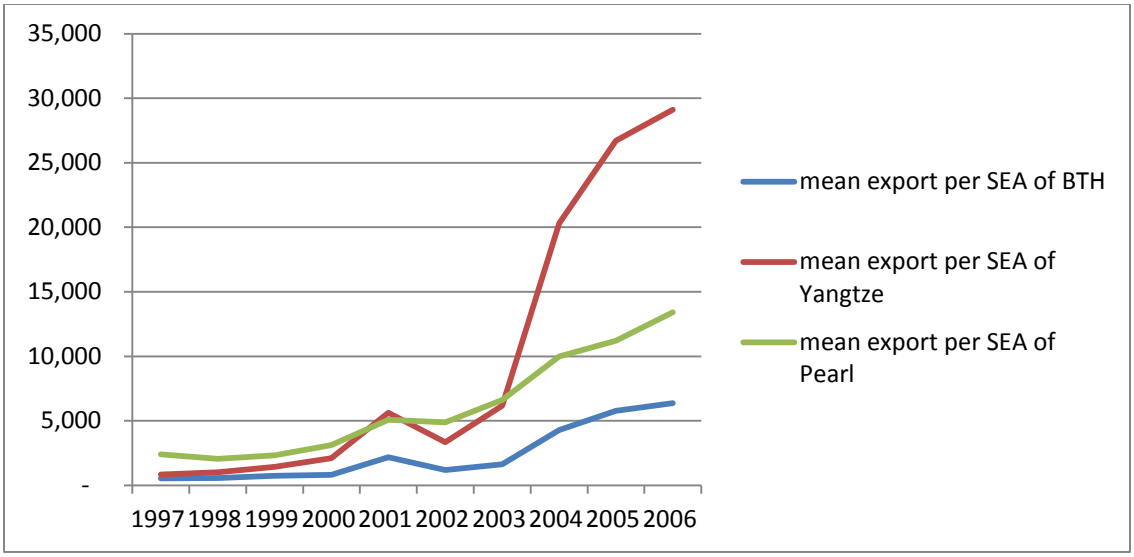
There is also a huge discrepancy among the export of SEAs in the three most developed city agglomerations. The SEAs in Yangtze River Delta increased quickly beginning from 2003 and had the highest export among the three agglomerations. In 2006, the export of SEAs in Yangtze River Delta was 436,000 million, which was almost 5.7 times of that in Beijing-Tianjin-Hebei Region and 2.3 times of that in Pearl River Delta. One reason for the highest export in Yangtz River Delta is that there are more SEAs in this part, so the gross export is higher. The reason for the lowest export in Beijing-Tianjin-Hebei Region is that it has the fewest SEAs. Most SEAs are in Beijing, which are rarely established in other cities. The distribution of SEAs in other two city agglomerations is more balanced.

Graph 4 Total export of SEAs in three city agglomerations (in Million USD) Y1997-Y2006



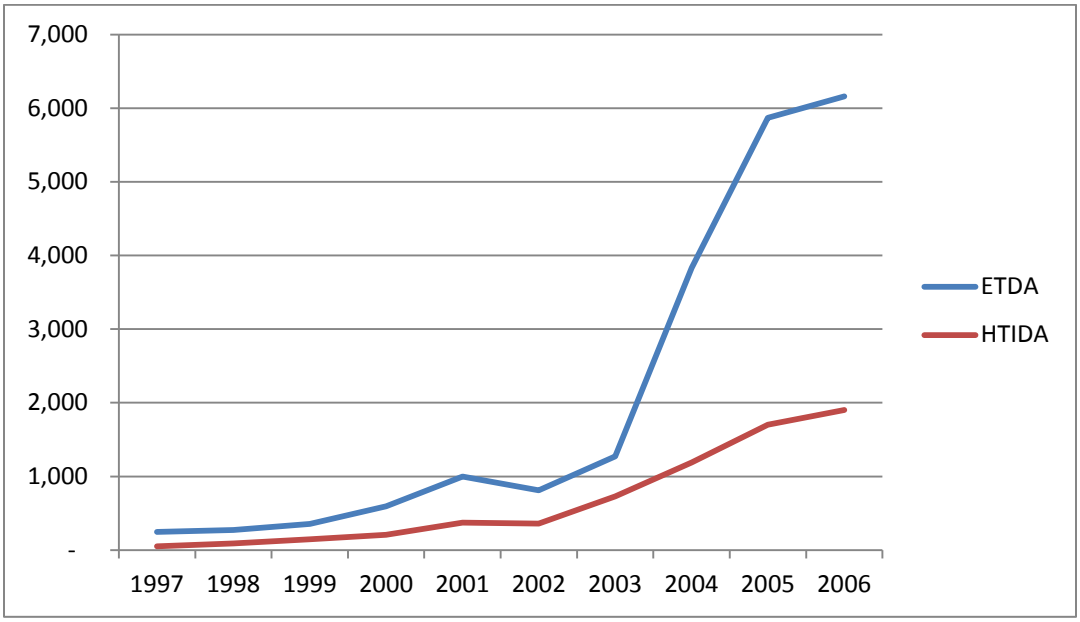
The average export of SEAs in Pearl River Delta is slightly higher than that in Yangtze River Delta before Year 2003. From 2003, the average export in Yangtze River Delta climbs quickly and results in a larger difference when compared with the other two city agglomerations

Graph 5: Average export of SEAs in 3 city agglomerations (in million USD) Y1997-Y2006



The average export of ETDA is higher than the average export of HTIDA in the ten years and the difference is becoming larger (Graph 6 & Appendix Table 10)

Graph 6: Average export of EDTA and HTIDA (in million USD) Y1997-Y2006



5 Results and discussions

For hypothesis 1: the export of SEAs is higher than the export in the rest part of the city.

Table 3 presents the empirical results of Model 1. It shows that the coefficients of all interactions (from SEA*Y1998 to SEA*Y2006) are negatively correlated with the export. It indicates that the export of SEAs is lower than the export of regular areas, which is consistent with Graph 2. Another finding is that the coefficient of the interaction is becoming smaller gradually. It can be seen that although the exports in SEAs are smaller than that in regular areas, the difference is becoming smaller over years. The export of SEAs is catching up that of regular areas.

Table 2 Results of Model1

	(1)
VARIABLES	$\ln(export_{izt})$
SEA *Y1998	-4.366***
	(0.359)
SEA*Y1999	-4.113***
	(0.345)
SEA*Y2000	-3.716***
	(0.354)
SEA*Y2001	-3.251***
	(0.396)
SEA*Y2002	-2.969***
	(0.290)
SEA*Y2003	-2.705***
	(0.337)
SEA*Y2004	-2.039***
	(0.337)
SEA*Y2005	-2.072***
	(0.382)
SEA*Y2006	-1.687***
	(0.325)
Constant	18.363***
	(0.034)
Observations	4,622
Number of prod_short	422
R-squared	0.241
Robust standard errors in parentheses	
*** p<0.01, ** p<0.05, * p<0.1	

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The empirical result of Model 1 doesn't support the hypothesis 1. The result shows an opposite finding that the export of SEAs is lower than the export of regular areas. One reason could be that the export of SEAs is quite low when they are at the stage of immaturity. The establishment time of SEAs is far behind the regular areas. When most regular areas are mature, some SEAs just start the business. So the whole export of SEAs is lower than that of the regular areas.

The decrease in the magnitude of the coefficients over the years indicates that the difference of the export in SEAs and regular areas is becoming smaller over years. This is because most SEAs become mature over years, then the exports of the SEAs increase.

For Hypothesis 2: The export of SEAs in Beijing-Tianjin-Hebei Region is lower than that in Yangtze River Delta and Pearl River Delta

The coefficients of interaction SEA*Y1998-SEA*Y2003 are significantly negative. It is consistent with the result of Model 1 that the export of SEAs is lower than the export of regular areas. However the coefficients of interaction SEA*Y1998*dYangtze - SEA*Y2006*dYangtze and SEA*Y1998*dPearl - SEA*Y2006*dPearl are all insignificant. It implies that there is no big difference between the export of SEAs in Beijing-Tianjin-Hebei Region and the other two city agglomerations.

Table 3 Results of Model2

	Model2				
VARIABLES	ln($export_{izt}$)				
SEA*Y1998	-3.404***	SEA *Y1998*dYangtze	-0.177	SEA *Y1998*dPearl	-1.156
	(0.952)		(1.551)		(1.917)
SEA*Y1999	-2.982***	SEA *Y1999*dYangtze	-0.051	SEA *Y1999*dPearl	-0.712
	(0.971)		(1.561)		(1.701)
SEA*Y2000	-2.818***	SEA *Y2000*dYangtze	0.619	SEA *Y2000*dPearl	-1.895
	(0.850)		(1.197)		(2.296)
SEA*Y2001	-1.162**	SEA *Y2001*dYangtze	0.320	SEA *Y2001*dPearl	-2.966
	(0.511)		(0.727)		(2.261)
SEA*Y2002	-2.290**	SEA *Y2002*dYangtze	1.022	SEA *Y2002*dPearl	-1.195
	(0.963)		(1.143)		(1.911)
SEA*Y2003	-1.906**	SEA *Y2003*dYangtze	1.176	SEA *Y2003*dPearl	-1.426
	(0.934)		(1.123)		(1.965)
SEA*Y2004	-0.548	SEA *Y2004*dYangtze	0.749	SEA *Y2004*dPearl	-1.516
	(0.796)		(1.012)		(1.580)

SEA*Y2005	-0.541	SEA *Y2005*dYangtze	0.973	SEA *Y2005*dPearl	-1.344
	(1.022)		(1.227)		(1.705)
SEA*Y2006	-0.487	SEA *Y2006*dYangtze	1.108	SEA *Y2006*dPearl	-1.532
	(0.981)		(1.178)		(1.782)
Constant	21.881***				
	(0.206)				
		Observations	528		
		Number of prod_short	34		
		R-squared	0.303		
		Robust standard errors in parentheses			
		*** p<0.01, ** p<0.05, * p<0.1			

The result suggests that the export of SEAs in Beijing-Tianjin-Hebei Region is not significantly different from the export of SEAs in Yangtze River Delta and Pearl River Delta. The reason could be that the export of every SEA is similar in these three regions. Although the number of SEAs in Beijing-Tianjin-Hebei is lower than the other two city agglomerations, each SEA has similar capacity of exports compared with the other two. Yangtze River Delta and Pearl River Delta have more SEAs than the Beijing-Tianjin-Hebei Region, but the export per SEA is not higher.

For Hypothesis 3: ETDA has higher exports than HTIDA.

Empirical results are demonstrated in Table 4. The coefficients of interaction ETDA*Y2000-ETDA*Y2006 are positive and significant. It indicates that the export in ETDA is higher than the export in HTIDA across years. Meanwhile, the number is becoming larger gradually, which suggests that the difference between the export of ETDA and HTIDA is becoming larger over years.

Table 4 Results of Model3

	Model3
VARIABLES	$\ln(export_{izt})$
ETDA *Y1998	0.848
	(0.705)
ETDA *Y1999	1.051
	(0.669)
ETDA *Y2000	1.425**
	(0.643)

ETDA *Y2001	1.628**
	(0.757)
ETDA *Y2002	1.775**
	(0.671)
ETDA *Y2003	1.669*
	(0.921)
ETDA *Y2004	2.943***
	(0.681)
ETDA *Y2005	3.230***
	(0.655)
ETDA *Y2006	3.365***
	(0.716)
Constant	16.596***
	(0.194)
Observations	677
Number of prod_short	58
R-squared	0.159
Robust standard errors in parentheses	
*** p<0.01, ** p<0.05, * p<0.1	

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In the Model 3, the positive and significant coefficients support the hypothesis 3 that export of ETDA is higher than the export of HTIDA. The different development goal between ETDA and HTIDA is an important role in explaining this finding. The goal of ETDA is to enlarge oversea markets and develop domestic economy by attracting foreign capital and technology, while the goal of HTIDA is to develop high and new technology industries (Anonymous, 2000). The development goal of ETDA makes them emphasize the importance of the export, so their work contributes a lot to the export. Due to the different goal, the export of ETDA is higher than HTIDA.

The result also shows that the divergence of the export between ETDA and HTIDA becomes bigger over years, which is also due to the different development goal of these two areas. Another reason accounting for the small export of HTIDA is that in the recent years, China has seen a serious situation in which its high-technique export is hindered by patent barriers from the import countries (Huang, 2005). So the export of HTIDA increases slowly. But most products in ETDA are traditional products, like clothes, which has less trade limitation.

For Hypothesis 4: The export of ETDAs in Beijing-Tianjin-Hebei Region is lower than that in Yangtze River Delta and Pearl River Delta

The coefficients of interaction ETDA*Y1999-ETDA*Y2006 are positive and significant. It implies that the export of ETDA is higher than the export of HTIDA in the three city agglomerations, which is consistent with result of the test in Hypothesis 2. The coefficients of the interaction ETDA*Y1998*dYangtze- ETDA*Y2006*dYangtze are all significantly negative. It indicates that the export of ETDA in Yangtze River Delta is lower than the export of ETDA in Beijing-Tianjin-Hebei Region. All the coefficients of the interaction ETDA*Y1998*dPearl- ETDA*Y2006*dPearl are insignificant, which means there is no big difference between the export of ETDA in Beijing-Tianjin-Hebei and Pearl River Delta.

Table 5 Results of Model4

	Model4				
VARIABLES	ln(exporti,z,t)				
ETDA*Y1998	1.266	ETDA *Y1998*dYangtze	-2.241**	ETDA *Y1998*dPearl	0.848
	(0.857)		(0.957)		(0.857)
ETDA *Y1999	1.535*	ETDA *Y1999*dYangtze	-2.152**	ETDA *Y1999*dPearl	0.685
	(0.837)		(0.931)		(0.837)
ETDA *Y2000	1.938***	ETDA *Y2000*dYangtze	-1.932**	ETDA *Y2000*dPearl	0.781
	(0.612)		(0.767)		(0.612)
ETDA *Y2001	3.076***	ETDA *Y2001*dYangtze	-2.620***	ETDA *Y2001*dPearl	0.439
	(0.435)		(0.784)		(0.435)
ETDA *Y2002	2.610***	ETDA *Y2002*dYangtze	-2.313**	ETDA *Y2002*dPearl	0.530
	(0.633)		(0.911)		(0.633)
ETDA *Y2003	3.062***	ETDA *Y2003*dYangtze	-2.383**	ETDA *Y2003*dPearl	0.675
	(0.533)		(0.871)		(0.533)
ETDA *Y2004	4.120***	ETDA *Y2004*dYangtze	-2.838***	ETDA *Y2004*dPearl	0.550
	(0.387)		(0.830)		(0.387)
ETDA *Y2005	4.664***	ETDA *Y2005*dYangtze	-3.247***	ETDA *Y2005*dPearl	0.265
	(0.287)		(0.905)		(0.287)
ETDA *Y2006	4.728***	ETDA *Y2006*dYangtze	-3.102**	ETDA *Y2006*dPearl	0.310
	(0.439)		(1.103)		(0.439)
				Constant	18.714***
					(0.140)
		Observations	288		
		Number of prod_short	19		

		R-squared	0.199		
		Robust standard errors in parentheses			
		*** p<0.01, ** p<0.05, * p<0.1			

The result doesn't support the hypothesis 4. The result shows that the export of ETDA in Yangtze River Delta is lower than the export of ETDA in Beijing-Tianjin-Hebei Region. The reason is that although there are fewer ETDA in Beijng-Tianjin-Hebei region, the export of every ETDA in this region is very high. Another finding is that there is no big difference between the export of ETDA in Beijing-Tianjin-Hebei Region and Pearl River Delta. This is because the export of ETDA in Pearl River Delta similar with that in Beijng-Tianjin-Hebei region.

5 Conclusions

Directed by the reform and opening-up policies, China established SEAs to boost the economy, including export promotion. In this paper, the research question "How does the establishment of SEAs influence the export of the areas in China?" is answered. By analyzing the data of export from 1997 to 2006, the results show that first, the total export of SEAs is lower than the export of regular areas but the average export of SEAs is higher than that of regular areas. And the difference of total export between the two areas is becoming smaller over years. Secondly, the export of SEAs in Beijing-Tianjin-Hebei is not significantly different from the other two agglomerations. Thirdly, the export of ETDA is higher than the export of HTIDA. The difference is also becoming larger over years. Fourthly, the export of ETDA in Beijing-Tianjin-Hebei Region is not significantly different from Pearl River Delta, but significantly higher than that in Yangtze River Delta. So the establishment of SEAs indeed boosts the prosperity of the export in China, but the magnitude of influences varies in different types of SEAs. The SEAs in Beijing-Tianjin-Hebei Region is not weak as expected when compared with other two city agglomerations.

This paper just analyzes the influences of the SEA on the export. There are some factors, which can influence the SEAs, including the quality of workers and foreign direct investment. So these factors influence the export indirectly. The further research will cover these factors to analyze the influences of SEA on export more detailed.

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Appendix

Table 6

Exports of regular areas and SEAs in China from 1997 to 2006(in million USD)[7]

Year	export_regular	number of regular areas	export_SEAs	number of SEAs	magnification
1997	306,000	474	55,400	91	5.5
1998	313,000	470	57,200	92	5.5
1999	352,000	471	65,100	92	5.4
2000	464,000	471	91,600	93	5.1
2001	510,000	488	190,000	98	2.7
2002	658,000	507	144,000	102	4.6
2003	892,000	508	217,000	105	4.1
2004	1,060,000	494	542,000	104	2.0
2005	1,310,000	494	683,000	106	1.9
2006	1,540,000	489	761,000	105	2.0

[7] Several regular areas of one city is set as a unit zone.
[7]

Table 7 Descriptive statistics of exports in SEAs and regular areas per year (in million USD)

Year	Zone	Obs	Mean	Std. Dev.	Min	Max
1997	regular area	409	680	2,900	0.011	36,800
	SEA	54	764	2,760	0.000	18,900
1998	regular area	408	697	3,160	0.004	41,100
	SEA	54	778	2,810	0.012	19,700
1999	regular area	409	782	3,640	0.000	47,700
	SEA	54	839	2,950	0.024	20,500
2000	regular area	409	1,030	4,720	0.008	63,700
	SEA	55	1,210	4,260	0.012	29,900
2001	regular area	402	1,060	6,510	0.000	96,900
	SEA	57	1,960	6,230	0.002	43,400
2002	regular area	408	1,490	7,180	0.001	96,100
	SEA	57	1,780	6,750	0.028	48,400
2003	regular area	409	2,030	9,610	0.006	127,000
	SEA	60	2,540	9,690	0.021	66,300
2004	regular area	399	2,320	14,400	0.001	229,000
	SEA	59	4,930	15,400	0.029	91,800
2005	regular area	400	2,870	18,300	0.000	304,000
	SEA	60	6,390	20,700	0.001	124,000
2006	regular area	400	3,350	22,400	0.001	388,000
	SEA	59	7,190	23,300	0.063	127,000

Table 8 Average exports of SEAs and regular area across years (in million USD)

year	averager export of SEAs	average export of regular areas	difference
1997	764	680	84
1998	778	697	81
1999	839	782	57
2000	1,210	1,030	180
2001	1,960	1,060	900
2002	1,780	1,490	290
2003	2,540	2,030	510
2004	4,930	2,320	2,610
2005	6,390	2,870	3,520
2006	7,190	3,350	3,840

Table 9 Descriptive statistics of export in HTIDA and ETDA per year. (in million USD)

Year	type of SEA	Obs	Mean	Std. Dev.	Min	Max
1997	ETDA	20	245	469	0.103	2,120
	HTIDA	44	51	160	0.000	915
1998	ETDA	20	273	512	8.321	2,320
	HTIDA	44	91	327	0.012	1,700
1999	ETDA	20	357	616	2.909	2,720
	HTIDA	44	147	578	0.024	3,630
2000	ETDA	20	593	963	1.143	3,730
	HTIDA	45	206	872	0.010	5,650
2001	ETDA	21	1,000	1,770	0.280	6,560
	HTIDA	47	372	1,210	0.002	7,600
2002	ETDA	21	813	1,290	2.287	4,500
	HTIDA	47	361	1,580	0.005	10,500
2003	ETDA	23	1,270	2,580	0.000	11,500
	HTIDA	48	729	3,510	0.021	24,000
2004	ETDA	23	3,830	10,400	5.891	49,500
	HTIDA	47	1,190	4,140	0.029	23,300
2005	ETDA	24	5,870	17,400	7.819	85,700
	HTIDA	48	1,700	6,680	0.000	38,100
2006	ETDA	24	6,160	15,200	10.200	74,000
	HTIDA	47	1,900	8,060	0.063	51,500

Table 10 Average exports of ETDA and HTIDA across years (in million USD)

Year	average export of ETDA	average export of HTIDA	difference
1997	245	51	194
1998	273	91	182
1999	357	147	210
2000	593	206	387
2001	1,000	372	628
2002	813	361	452
2003	1,270	729	541
2004	3,830	1,190	2,640
2005	5,870	1,700	4,170
2006	6,160	1,900	4,260

Table 11 Total export of SEAs in three city agglomerations (in Million USD) Y1997-Y2006

year	total_export_BTH	number of SEZs	total_export_Yangtze	number of SEZs	total_export_Pearl	number of SEZs
1997	4,410	8	12,400	15	23,900	10
1998	4,560	8	15,100	15	24,600	12
1999	5,950	8	21,400	15	25,600	11
2000	6,450	8	31,400	15	37,500	12
2001	17,300	8	84,400	15	60,900	12
2002	14,300	12	50,300	15	58,400	12
2003	19,400	12	92,400	15	79,300	12
2004	51,500	12	304,000	15	120,000	12
2005	69,300	12	400,000	15	134,000	12
2006	76,500	12	436,000	15	161,000	12

Table 12 Descriptive statistics of export per SEA in three city agglomerations (in Million USD) Y1997-Y2006

Year	city agglomerations	Obs	Mean	Std Dev.	Min	Max
1,997	BTH	8	551	1,290	0.000	3,720
	Yangtze	15	825	1,890	0.094	7,550
	Pearl	10	2,390	5,310	0.162	17,000
1,998	BTH	8	570	1,350	1.526	3,890
	Yangtze	15	1,010	2,000	0.026	7,940
	Pearl	12	2,050	4,810	0.190	16,800
1,999	BTH	8	743	1,830	2.001	5,280
	Yangtze	15	1,430	2,460	0.029	9,470
	Pearl	11	2,330	5,000	0.642	16,800
2,000	BTH	8	806	1,960	2.372	5,660
	Yangtze	15	2,090	3,340	1.973	12,800
	Pearl	12	3,130	6,770	0.012	23,500
20,001	BTH	8	2,170	3,470	33.500	10,100
	Yangtze	15	5,630	10,900	68.200	41,900
	Pearl	12	5,070	10,700	0.051	37,000
2,002	BTH	12	1,190	3,720	0.042	13,000
	Yangtze	15	3,350	5,340	50.800	19,700
	Pearl	12	4,870	9,610	0.231	31,000
2,003	BTH	12	1,620	4,830	0.048	16,900
	Yangtze	15	6,160	9,580	47.100	31,700
	Pearl	12	6,610	12,700	0.410	38,300
2,004	BTH	12	4,290	8,120	19.200	27,200
	Yangtze	15	20,300	33,200	59.300	104,000
	Pearl	12	10,000	17,300	3.252	53,100
2,005	BTH	12	5,770	10,800	13.300	36,200
	Yangtze	15	26,700	41,100	34.900	118,000
	Pearl	12	11,200	18,600	3.267	49,800
2,006	BTH	12	6,370	12,200	17.200	41,200
	Yangtze	15	29,100	45,300	32.800	137,000
	Pearl	12	13,400	24,100	1.289	72,400