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**Chinese Foreign Trade Performance and the China-US Trade: 1995 –
2004--- A Graphical Analysis Based on China Customs Statistics***

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JEL classifications: F14, F15

Key words: trade, production fragmentation, FDI

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1. INTRODUCTION

Related Literature

The past decade has witnessed tremendous growth in Chinese foreign trade. The period was also punctuated by numerous important events that helped shape the patterns of Chinese foreign trade: huge inflows of foreign direct investment (FDI) into China, the Asian financial crisis in the late 1990s, China's accession to the World Trade Organization (WTO) in 2001, and the rise of Yangtze Delta region as a new engine of growth for the Chinese economy, to name a few. The integration of the Chinese economy into world trade is closely related to the process of production disintegration in the world economy.

Expansion of Chinese manufactured exports, some as a result of foreign outsourcing to China, and the important role of Hong Kong as China's gateway to the world exemplify the new aspects of world trade identified 10 years ago by Paul Krugman (Krugman 1995), i.e., "slicing up the value chain" and the subsequent expansion of world trade and the emergence of super trading nations. One year later, Barry Naughton offered a comprehensive analysis of the Chinese foreign trade in the first 15 years since Chinese reform started (Naughton 1996), attributing the rapid growth of Chinese foreign trade to the institutional innovation of the export-processing regime and preferential policies towards export-oriented foreign funded enterprises (FFE¹). These two papers provide excellent institutional and economic analyses of Chinese foreign trade and its global environment up to 1995.

The detailed empirical make-up of Chinese foreign trade was first revealed in a survey using detailed 1994 enterprise level trade data from Chinese Customs (International Trade Centre 1995). It shows a rapidly growing number of exporters and importers over 1993-94, a low concentration of foreign trade in terms of individual traders, but a pronounced geographical concentration. In addition, half of China's trade in 1994 was handled by foreign enterprises, while their share in machinery imports reached 55%. Processing exports (imports) accounted for 47% (41%) of total exports (imports) compared to 51% (30.7%) for ordinary trade; but the retained value of processing trade was much smaller, around 17% compared to 50% for ordinary trade. Meanwhile, the main formats of trade in the pre-reform era, namely, barter, border and compensation trade, only played a marginal role in 1994.

Recently, two studies by CEPII researchers look into the pattern of Chinese foreign trade over time, using time series data from Comtrade (6-digit HS codes) and from China Customs with a total of four variables: trade products (2-digit HS codes), trade regime, type of trading companies, and trade partners. Lemoine, et al. (2004) examine the evolution of Chinese trade patterns over 1993-1999, and show that China's trade growth is directly linked to its integration into the international segmentation of production processes. Through production sharing with Asian

¹ FFEs refer to joint ventures and wholly foreign funded enterprises.

countries and specialization in assembly operations, China's manufactured exports have achieved rapid diversification. Assembly operations have helped with technological upgrading of China's foreign trade, but have only had limited impact on local producers' participation in foreign trade. Using the same data updated to 2003, Gaulier, et al. (2005) examine China's trade in international dimensions. They confirm the observations found by Lemoine, et al. (2004) regarding the relationship between Asian production fragmentation and China's trade growth. They also find that Asian trade is increasingly centered on China, with particularly significant changes in the trade patterns of Japan and the newly industrialized dragon economies (Taiwan, Hong Kong, Singapore and Korea). In light of the deterioration of China's terms of trade since 1995, the paper calls into question the sustainability of China's trade growth.

The ITC (1995) uses almost the complete set of Chinese Customs data but for only one year, while the CEPII studies use time series Chinese trade data over 1993-2003 but with only four variables. Therefore, the changing patterns of Chinese foreign trade in the past decade have not been fully revealed. This is the motivation of this paper.

Relevant Background of Chinese Reform Since the Early 1990s

In the early 1990s, the focus of Chinese economic reform was shifting from the southeast provinces to the Yangtze Delta regions. In April 1990, the Central Government decided to develop Shanghai's Pudong District and to establish the Suzhou Industrial Park. Deng Xiaoping's tour of the south in early 1992 gave Chinese reform a much needed strong political impetus and after that, a series of bold reform initiatives were introduced, including extending the preferential policies and regulations, enjoyed by the Special Economic Zones established in the 1980s, to a wider area along the coast and the Yangtze River. At the core of all those preferential policies and regulations governing various development zones are the autonomy given to local governments to approve foreign funded enterprises in a simplified and expeditious manner and tax concessions given to those FFEs. Those preferential policies, together with the fine infrastructure for light industry, a pool of skilled labor force and a favorable geographical location, have helped attract a large amount of foreign direct investments (FDIs) into the Yangtze Delta region since the early 1990s. According to China Statistics Yearbooks, from 1995 to 2004, utilized FDI in China increased from \$37.5 billion to \$60.6 billion. The Yangtze Delta's share of China's annual total FDI inflow rose from 23.6% on average over 1995-97 to 36.5% on average over 2002-03, while Guangdong's share declined from 26.2% to 20.7% for the same period.

The inflow of FDI into China in the past decade was also motivated by external factors. Production sharing between China and ASEAN has been ongoing since the late 1980s. The Asian financial crisis in the late 1990s left the ASEAN economies in a shambles. In comparison, China was a much better alternative for FDIs that would

otherwise have gone to Southeast Asia. Data from the IMF shows that during the late 1990s and early 2000s, FDI inflow into China was increasing over time, while FDI inflows to key ASEAN countries (Thailand, the Philippines, Malaysia and Indonesia) were fluctuating and declining.

Traditionally, Southeast Asia has had a strong trade relationship with the United States, exporting mainly labor-intensive manufactured goods. FDI movement from ASEAN to China, as a result of the Asian financial crisis, also brought in their exporting capacity, as well as production linkages between China-based FFEs and the ASEAN economies. Thus, FDI inflows reinforced the production linkages in the region.

FDI in China is a key determinant of China's trade expansion, for two reasons. First, most FDI is engaged in processing and assembly trade operations--importing parts and components from abroad and exporting the finished goods. These operations are generally supported by China's processing trade regime, under which imports are free of duty and value-added taxes, and products using imported inputs are required to be exported.² This processing trade regime itself only facilitates but does not encourage processing trade. Second, the additional tax concessions given to export-oriented FFEs encourage increased exporting. This point is very well made by Naughton (1996, 302):

“None of the concessions are unique. All are observed elsewhere in East Asia and, indeed, around the globe. The scale on which these provisions are introduced in China, however, is unusual. In most countries, such concessionary provisions are only applicable within a strictly policed processing zone. In essence, China created a kind of gigantic export processing zone, defined not geographically, but by juridical status of the enterprise involved. Although the SEZs attracted a lot of attention and were located near important economic centers in southern coastal China, they did not determine the extent of the export processing regime: export-oriented FIEs qualified, whether they are located in SEZs or not.”

The above description applies for the first 15 years of the reform era, but powerful incentives for export-oriented FFEs remain as of today, and even more so with many additional incentives given by local governments.

Competition among local governments to attract FDI and to create jobs and growth also plays a role. Economic growth, FDI inflow and export promotion are not only on the platform of all China's Five-Year Plans in the reform era, but are also key criteria for promotion of local officials (Li and Zhou, 2005). Huang (2003) explains the inflow of FDI into China from a different perspective, arguing that failure of state-owned enterprises, institutional discrimination against private firms and fragmentation of domestic markets constrains the growth and investment options of

² For a full definition of China's various processing trade arrangements, see section 2.8.

domestic firms, and create high demand for FDI. As such, local governments have been giving additional concessions or preferential policies to FDIs, particularly those exporting FFEs, through cheap loans, free land use (often at the expense of farmers), subsidized energy supply and lax enforcement of environmental law³, etc., and they serve as additional incentives for export-oriented FDI to go to China.

As shown in the remaining part of this paper, machinery and electronics combined have experienced the largest expansion in exports. Those products typically have low transportation costs compared to their value and are most suitable for production sharing. As a matter of Chinese industrial policy, the two sectors have also been regarded as high-tech sectors and selected as key industries by several national programs to promote technological upgrading. The electronics sector is largely dominated by FFEs according to various measures (Zhao, et al. 2007).

In summary, in the era of global outsourcing, or “slicing up the value chain” in the words of Krugman (1995), China’s bold reform initiatives since the early 1990s, its shift of focus to the Yangtze Delta regions, various incentives given to export-oriented FFEs and the institutional innovation of the processing trade regime, explain the huge inflow of FDI into China, China’s expansion of trade (both imports and exports) and the rise of the Yangtze Delta in China’s foreign trade in the past decade.

Goals of This Paper

Against the domestic and international background outlined in Krugman (1995) and Naughton (1996) as well as new developments mentioned above, this paper provides a statistical and graphical analysis of key features of the Chinese foreign trade over the past decade. Given that the United States is a key trading partner for China, and the U.S.-China bilateral deficit is the largest among all US trading partners, this paper also gives special attention to China-US trade when it differs significantly from the China world trade.

This paper examines detailed Chinese Customs data for the period 1995-2004 (Yao, Dean, Hammer and Wang, 2006). For easy exposition, this paper groups Chinese regions, trading partners and sectors into manageable aggregate levels, and produces graphs and summary statistics to illustrate its findings. It does not try to reveal all stylized facts about Chinese foreign trade, but instead, seeks answers to key questions that will help reveal and understand the changing patterns of Chinese foreign trade and the driving forces behind those changes. Links are established between FDI inflow and Chinese trade expansion, the regional and sectoral power horses behind Chinese trade growth are identified, and a picture of production sharing among China, its Asian neighbors and the United States is sketched. The paper also explores the institutional innovations of the Chinese customs regime that help facilitate the process

³ Dean, Lovely and Wang (2005) finds that weak environmental regulations in China only attract firms in highly-polluting industries from Hong Kong, Taiwan and Macao and they have no impact on investment decisions by firms from OECD countries.

of global outsourcing to China. It examines the role of various specially designated zones in promoting Chinese foreign trade, and also shed lights on the nature of China's apparent technology upgrading in its exports.

This paper has three Sections. The next section includes discussions of 11 topics that correspond to and appear in the same order as the 11 figures listed in the table of contents. Section 3 concludes with a summary of the main findings.

2. CHINESE FOREIGN TRADE: A GRAPHICAL ANALYSIS

2.1 OVERALL TRADE PATTERNS

From 1995 to 2004, Chinese foreign trade, defined as imports plus exports, increased from \$281 billion to \$1,155 billion, a growth of over 300% (figure 1.1). Trade in agriculture⁴, however, remained flat for most of the years and its share in total trade declined from 8.1% in 1995 to 3.6% in 2004.

China runs a trade surplus in all ten years, which peaked at \$43.4 billion in 1998 and has stabilized around \$30 billion in recent years (figure 1.2). Among all its trading partners, the data show that China had the largest bilateral surplus with Hong Kong consistently over the period, followed by NAFTA (United States, Canada and Mexico) and the 15 EU-member countries combined. With the exception of Hong Kong, China ran a deficit with all major neighboring Asian countries and regions, including Taiwan, South Korea, Japan and ASEAN.

Hong Kong is a gateway for Chinese exports to the world and the world's exports to China. Chinese customs data on exports to Hong Kong are overstated. On the other hand, data on Chinese imports from Hong Kong do not have this problem, but have mis- or underinvoicing problems due to smuggling. This asymmetry in data reporting on China-Hong Kong trade explains China's surprisingly huge trade surplus with Hong Kong.⁵ This gives us confidence that NAFTA, or the United States, to be precise, is the top surplus country for China.

China's trade surplus with the world showed considerable variability during the period. In contrast, the Chinese trade surplus with the United States grew steadily over the period reaching \$80 billion in 2004. China's soaring surpluses with the

⁴ Defined in the annex to the Uruguay Round Agreement on Agriculture.

⁵ For Chinese exports, goods recorded as exports to Hong Kong may actually be destined for a third country. Since 1993, the Chinese Customs has been trying to identify the final destinations of Chinese exports but the work can not be exhaustive because Chinese exporters and even the Hong Kong traders who run the re-export business really don't know the final destination when the goods clear the Chinese customs as exports and clear the Hong Kong customs as imports. Only when goods are further processed in Hong Kong and sorting is done there, can Hong Kong traders know where exactly goods will be eventually shipped to. That's why the Hong Kong import data does not have information on final destination and only re-export data has (Feenstra, et al. 1998).

NAFTA and EU-15 countries are mirrored by soaring deficits with all other regions, which makes Chinese trade balance with the world at a stable magnitude. The patterns are consistent with the observation that re-organization of production and trade is accelerating and centering on China in the Pacific rim region (Lemoine, et al. 2004; Gaulier, et al. 2005). The data highlight the driving force behind the trade imbalance between China and the United States: China is increasingly becoming part of the global production chain, importing parts and components from its Asian neighbors and exporting processed goods to the United States and EU15.

2.2 TRADE DISTRIBUTION BY CHINESE REGION

Regions in this subsection refer to the Chinese locations where exports are originally produced or imports are finally consumed. For composite regions, their grouping scheme can be found in appendix 2.

For China's trade with the world, the regional distribution of Chinese imports and exports are quite similar and therefore only figures for total trade (export + import) with rest of the world are given for the first and last three years. Comparing figures 2.1 and 2.2 reveals that the relative importance of Guangdong province was declining, while that of the Yangtze Delta was growing. On average over the last three years, Guangdong, the Yangtze Delta and the rest of China each accounted for about a one-third share of total Chinese foreign trade.

China-US trade follows roughly the same patterns in terms of the regional distribution of imports and exports and the changing weights for Guangdong and the Yangtze Delta. Some differences are observed but mostly in magnitudes (figures 2.3~2.6). For Chinese exports to the United States, the shares of Guangdong were significantly bigger than the national average for the same period (52 vs 38% and 40 vs 33% for the first and last three years, respectively). On the import side, however, Guangdong's shares were significantly smaller and also declined only by a small margin. It seems that the only significant changes in the regional distribution of China-US trade took place on the export side. Finally, Northern China, which includes Beijing and Tianjin, accounted for a quite sizeable share of trade over the years (18~21% vs 9~11% national average), suggesting that imports from the United States were a bit biased towards the nation's capital and its adjacent areas. This may have something to do with the patterns of US direct investment in China that are more for accessing the Chinese market than for cheap labor cost, compared to FDI from other countries. Because the quality of labor is a major concern, US direct investment tends to go to big cities like Beijing where universities and research institutions are located (Fung, Lau and Lee 2004). As a result, investment-related US trade with China tends to go to big cities, such as Beijing. The distinctive patterns of US FDI in China may lead to similar patterns for Chinese imports from the United States.

In terms of the trade balance (figures 2.7 and 2.8), Guangdong and Fujian generated

the most surplus with rest of the world (ROW) on average over the last three years and in this regards, Yangtze Delta was only at par with Shandong. But for China-US trade, the Yangtze Delta was only behind Guangdong in terms of trade surplus in recent years. In terms of the expansion of the China trade surplus with the United States, Guangdong and the Yangtze Delta contributed almost equally over time (roughly \$18~20 billion).

Rodrik (2006) argues that China is an outlier compared to other countries, as China's export surge cannot be simply explained by China's economic fundamentals at the national level. But if we consider that more than 80% of Chinese foreign trade concentrates along the coastal region (figure 2.2) where higher per capita GDP, better infrastructure and abundant capital/skilled labor endowments are found relative to the inland, it is reasonable to conjecture that Rodrik's conclusion would be different if those economic fundamentals were measured at the level of Chinese regions.

2.3 EXPORT BY CHINESE REGION VIA HONG KONG

This and the next subsection focus on the role of Hong Kong in China's trade with the rest of the world (ROW) (not including Hong Kong itself), and in the China-US trade.

Over the 10-year period, the share of Guangdong, Yangtze Delta and all other parts of China in the country's total export to rest of the world changed in a way similar to changes happened to the regions' exports to the world (including Hong Kong), i.e., the share of Guangdong declined and the share of Yangtze Delta rose (figures 3.1 and 3.2; figures 2.1 and 2.2). On average during the years 2002 and 2004, the Yangtze Delta accounted for 38% of Chinese total exports to rest of the world, Guangdong 27% and rest of China 35%. In comparison, Guangdong accounted for a larger though declining share of exports to the United States, down from 52 to 39%, and the Yangtze Delta's share was slightly smaller but rising, up from 20 to 36% (figures 3.3 and 3.4). Roughly speaking, Guangdong and the Yangtze Delta were at equal footing in their exports to rest of the world as well as to the United States.

However, in terms of the regional distribution of exports to rest of the world and the United States via Hong Kong, the positions of Guangdong and the Yangtze Delta were drastically different. Figures 3.5 and 3.6 show that overwhelming majority of the country's exports to rest of the world through Hong Kong originated in Guangdong, rising from 88% over 1995~97 to 98% over 2002~2004. Only a tiny percentage were from the Yangtze Delta, 2% over 1995~97 and almost none over 2002~04. The share for the rest of China was also small and declining from 10% to 2% over the years. Similar patterns hold for the regions' exports to the United States. In this regard, Guangdong was increasingly more integrated with Hong Kong in its exports to rest of the world and the United States.

The dependence of Guangdong and other regions on Hong Kong in their total exports to rest of the world and the United States was declining, though Guangdong still held

the largest share. Figure 3.7 shows a decline in Guangdong's share of exports to rest of the world via Hong Kong in its total export to rest of the world, down from 77% to 46% over the years; it also shows a decline of the shares for other regions, though Guangdong's share was the largest compared to other regions. For China as a whole, the share was 28% over 1995~1997 and 13% over 2002~2004. In short, the role of Hong Kong in Chinese exports to rest of the world is diminishing. Again, the same conclusion applied to exports to the United States but at slightly bigger magnitudes for all regions except for Guangdong (2002~04) (figure 3.8).

As discussed in subsection 2.1, there are significant amount of goods that have no known final destinations when they depart China for rest of the world via Hong Kong and they are treated as Chinese exports to Hong Kong. Therefore, the shares of Chinese regions' exports to rest of the world via Hong Kong indicated in figures 3.7 and 3.8 should be regarded as the lower bound and the actual shares are definitely higher.

2.4 IMPORT BY CHINESE REGION VIA HONG KONG

Referring to figures 4.1~4.4, there is a change in distribution of imports by Chinese regions from rest of the world and the United States, quite similar to that of exports, i.e., Guangdong's share is declining, while the Yangtze Delta share is rising.

Compared to discussions in the preceding subsection on exports via Hong Kong, findings on imports via Hong Kong in this subsection are quite similar and only differ in magnitudes. Specifically, the Guangdong's share in China's total imports from rest of the world via Hong Kong was smaller and increased by a smaller margin over time (figures 4.5 and 4.6); the share for Guangdong's imports for the United States is even smaller and remained almost unchanged over years (Figures 4.7 and 4.8); and the share of imports from rest of the world and the United States via Hong Kong in total imports from rest of the world and the United States were pretty much the same, declining by a smaller margin over time (figures 4.9 and 4.10). This suggests that not very much change has happened to the import side over time.

Referring to figures 4.9 and 4.10, in terms of share of imports via Hong Kong in a region's total imports from rest of the world, like exports, for all regions, shares for both rest of the world and the United States are declining; but unlike exports, imports from the United States were less dependent on Hong Kong than imports from rest of the world.

It is worthwhile to take note of the smuggling issue, i.e., smuggling into China via Hong Kong, which has been the subject of several studies, e.g., Wong (1998), Fisman and Wei (2004) and Fisman, Moustaterski and Wei (2005). Because of underreporting or missing reports, the above numbers understate the dependence of Chinese imports via Hong Kong, and should be regarded as the lower bound.

2.5 TRADE BY ZONE

For various purposes, various zones have been created since Chinese reform started. Special Economic Zones (SEZ) were created during 1980~88 to attract FFEs. Economic & Technological Development Areas (ETDA) were started in 1984 to substitute for SEZs, as well as to attract FFEs. Since 1991, there have been several Hi-Technology Industry Development Areas (HTIDAs) set up to promote high-tech industries, which operate within a designated area in cities and target domestic high-tech firms. To promote exports, Bonded Areas (BA) and Export Processing Zones (EPZ) were also put in place starting in 1990 and 2000, respectively. All those zones accounted for 27% of Chinese total exports and 34% of total import in 2004. Still, the majority of Chinese foreign trade went to the nonzone area.

It was also the nonzone areas that experienced the most dramatic growth in both exports and imports, compared to all other zones (figures 5.1 and 5.2). Together with its trade balance (figures 5.3 and 5.4), these figures for nonzone areas closely resemble those for China's total trade with rest of the world and the United States (figures 1.1, 1.2 and 1.3). This indicates that nonzone areas are the contributor of first-order importance to China's overall trade surplus and its surplus with the United States. This confirms Naughton's (1996) observation cited in subsection 2.2 that various zones do not necessarily determine the extent of trade growth.

In figure 5.3, the SEZs do not show a clear pattern as far as the trade balance is concerned, wavering from deficits to surplus over years. The ETDAs consistently imported more than they exported and the deficit grew larger over time, reaching \$15 billion in 2004. For most of the years except 2004, the HTIDAs had a small deficit. This is not surprising because those zones were not meant to promote exports. However, when comparing BAs with EPZs, the two zones designated to promote exports, only the EPZs had a surplus since their inception in 2000, but BAs had a deficit in all years reaching \$24 billion in 2004. For trade with the United States (figure 5.4), all but the BAs experienced surplus in all years. Clearly, how BAs operated in those years deserves further investigations.

2.6 TRADE BY SECTOR

Chinese foreign trade, especially exports underwent compositional changes over the 10-year period. As shown in figures 6.1 and 6.2, the most notable change was in the machinery, electrical machinery and parts (Mach/Electrical) sector: its share in total exports rose from 20% over 1995-97 to 40% over 2002-04. On the import side, the change was small, up from 36% to 42%, during the same time span (figures 6.3 and 6.4).

A more interesting story was the trade balance. As shown in figure 6.5, with regard to China's trade with the world, the textile and clothing sector was the leading surplus sector, followed at a distance by the miscellaneous (Misc) sector (mainly toys and furniture, etc). The Mach/Electrical sector turned from deficit in early years to

negligible surplus in later years. In contrast, for China-US trade (figure 6.6), it was the Mach/Electrical sector that contributed the most surplus, more than the sum of the surplus in textile and clothing and the Misc sectors.

What can we learn about the debate on China's trade relation with the United States from the difference concerning the Mach/Electrical sector in figures 6.5 and 6.6? Seeing the surge of Chinese Mach/Electrical exports to the United States, some observers argue that China is becoming a threat to the United States based on the understanding that the said sector is technology-intensive. Others believe that the surge is the outcome of US firms outsourcing the labor-intensive operations to China in the sector--part of the vertical specialization of global production that has been increasingly prevalent in the past decade (Hummels, Ishii and Yi, 2001), and therefore it does not constitute a threat. Indeed, figure series 9 show that surplus in this sector only appears under the processing trade regime. Simple comparison of the two figures tends to support the latter argument. If China's trade surplus with the United States in the said sector is a reflection of China's technological advancement, the surplus with the world should have been larger.

Another related issue is whether or not one can rely on trade data alone to label a category of products or even a specific product as high-, mid- or low-tech? The answer is no. According to Abbot (1991), sectoral grouping based on SITC or HS codes that appear to represent a high-tech sector may actually cover plenty of low-tech products (e.g., computer sector vs keyboard, mouse, etc). According to US Census experts, even at the most disaggregate level, some 10-digit HS codes can each cover many heterogeneous commodities.⁶

The proposition that the surge of Chinese machinery and electronics exports is not necessarily an indication of technological upgrading in that sector is consistent with observations of other China experts. Gilboy (2004) argues that the business risks inherent in China's unreformed political system has bred an "industrial strategic culture" that Chinese firms focus on developing privileged relations with government officials, spurn horizontal association and broad networking with each other, and forgo investment in long term technology development and diffusion. Lang (2006) examines the operations of several Chinese high-tech firms and reaches the conclusion that Chinese culture itself is simply not helpful in fostering the development of high-tech companies.

To take advantage of detailed information of the 8-digit HS trade data, Chinese tariff rates at 10-digit HS codes are used to derive information on the technological content of a product in the Mach/Electrical sector, where, the applied MFN tariffs are normally low for inputs but high for final products. This is part of China's industrial policy to promote the high-tech industry. *Therefore, the level of the tariff rate can serve as a proxy for the level of technological content.* Using the 2004 Chinese applied MFN

⁶ Communications with Zhi Wang of the United States International Trade Commission.

tariffs and the 2004 data, simple averages of tariffs for three categories of imports (ordinary trade (OT), processing and assembly trade (P&A), and processing trade with imported materials (PWIM), for details see section 2.8) are calculated.

Tariffs for Chinese imports from ASEAN (1.2-1.6%) are lower than those from South Korea (2.0~3.3%), which again is lower than those from Japan (2.4~5.5%). Imports from Korea and Japan also carry higher tariffs for ordinary trade. If import tariffs can serve as proxies for China perceived technological contents of traded commodities as discussed above, Chinese exports show lower technological contents (measured with average tariff rates) for exports to NAFTA (mainly the United States) and the 15 EU countries than those to Latin America, Africa and Middle East. Among the three categories of trade with NAFTA and EU-15 countries, technological contents (measured with tariff rates) of P&A and PWIM exports are lower than those of ordinary exports, while for trade with other three developing regions, technological contents (measured with tariff rates) of ordinary exports are normally lower than those of P&A and PWIM exports. For the Mach/Electrical sector, the numbers and comparisons suggest that (1) Chinese imports from ASEAN are more labor-intensive than imports from Japan and Korea; (2) Chinese exports to NAFTA and EU-15 countries are more labor-intensive than exports to the three developing regions; and (3) Chinese processing exports to NAFTA and EU15 are more labor-intensive than its OT exports to the same regions, while the opposite is true for Chinese processing exports to the three developing regions.

2.7 TRADE BALANCE BY ZONE AND SECTOR

The significance of the Mach/Electrical sector in generating the China-US trade surplus can also be found in figures 7.1~7.6, where a comparison is made between China-World and China-US trade by selected zones and sectors. For nonzone area, ETDAAs and BAs, the said sector stands up to be the key difference between the China-World and China-US trade in terms of sectoral distribution of trade balance. It is the leading deficit sector or sector with negligible surplus for the China-World trade, while the leading surplus sector for the China-US trade. But for all other zones, the Mach/Electrical surplus appears for both trade routes.

2.8 TRADE BY CUSTOMS REGIME

Chinese customs regimes can be broadly grouped into three categories: ordinary, processing and all other trade regimes. Ordinary trade is the trade that does not benefit from special customs regimes and tariff preference, unlike the processing trade regime that was set up in early years of the Chinese reform when the country was eager to promote exports to earn foreign currencies. Under the processing trade regime, goods are allowed to enter China duty free, but the processed goods cannot be sold in China, but must be exported. In recent years, it has become the main mode of foreign outsourcing to China, normally accompanied by FDI inflow into the processing sector. The broad processing trade regime consists of two customs arrangements: “processing and assembling (P&A)” and “processing with imported

materials (PWIM).” The key distinctions between the two are as follows:

(1) Under P&A, also called *lailiao jiagong* in Chinese, “the factory in China plays a fairly passive role, taking orders and receiving materials from foreign trading companies;” under PWIM, also called *jinliao jiagong* in Chinese, “the factory in China purchases the imported materials and organizes production and trade on its own.”⁷

(2) Imported materials used for P&A are provided by the foreign firms with the Chinese side spending no foreign exchange for imports, while materials for PWIM are imported by Chinese firms to meet their own needs for processing.

(3) The proprietary rights of the imported materials for P&A and the selling rights of the finished products belong to foreign firms, while the proprietary rights of the imported materials for PWIM and the selling rights of the finished products belong to the Chinese side.

(4) In P&A, the Chinese side only takes responsibility for processing and assembling the imported materials according to the requirements of foreign firms and the input quotas and rate of depreciation fixed by foreign firms which are charged for the operations done. The Chinese side takes no responsibility for the profits or losses in selling the subsequent products. But in PWIM, Chinese enterprises shall arrange the processing themselves and shall take sole responsibility for their own profits or losses.

In short, the foreign firms take control of the goods under P&A while the Chinese firms take control of the goods under PWIM. Which of the two forms a foreign company take in its outsourcing to China has been the subject of a recent study on the property rights theory of the firm (Feenstra and Hanson 2005).

Ordinary and processing trade account for the bulk of Chinese foreign trade and are the focus of this subsection. As shown in figures 8.1 and 8.2, both processing and ordinary trade (exports and imports) experienced steady growth over years. But processing trade dominated Chinese exports, while ordinary trade dominated imports in later years. On the export side, processing exports led the ordinary exports by a big margin (\$84 billion or 34.4% of the ordinary exports); on the import side, the gap was smaller (\$26 billion or 11.7% of the processing imports in 2004).

For China-US trade, as shown in figures 8.3 and 8.4, relative speaking, the gap between the ordinary and processing trade regimes has widened for both export and import (119.7% of the ordinary exports and 121.8% of the processing imports in 2004), though not in absolute terms.

In terms of the trade balance (figures 8.5 and 8.6), for both China-World and

⁷ Quotes come from Naughton (1996), page 300.

China-US trade, the processing regime consistently enjoyed surpluses over the years. For ordinary trade, however, the Chinese trade balance with the world slipped into deficit in 2003 and 2004, while Chinese trade balance with the United States kept rising, though far behind that under the processing regime.

Figure 8.7 shows China's trade balance with its Asian neighbors (ASEAN, Japan, Korea and Taiwan⁸) and it is a mirror image of the China-US trade balance (figure 8.6), as far as processing trade is concerned. It suggests a triangle among China, its Asian neighbors and the United States in production sharing: China imports parts and components from Asia and sell the processed goods to the United States.

Figures 8.8 and 8.9 further break the processing trade into P&A and PWIM to examine the trade relations of the triangle in details. The mirror images between the China-Asia and China-US trade balance still hold. China's growing trade deficit with Asia and growing surplus with the United States, particular under PWIM in recent years, show the production linkage of the three regions are deepening and the PWIM regime is the driving force behind this process.

2.9 TRADE BALANCE BY CUSTOMS REGIME AND SECTOR

Figures 9.1, 9.2 and 9.3 show that ordinary, processing and other trade regimes contribute to China's trade balance in different ways. For ordinary trade, the leading surplus contributor was textile and clothing sector (while the Mach/Electrical sector was running a deficit!); for processing trade, it is the Mach/Electrical sector; and for other regimes, almost all sectors showed deficits and most of the deficits were in the Mach/Electrical sector.

The huge surplus in Mach/Electrical sector in the processing trade is consistent with our belief that outsourcing was the main reason for the export expansion in the sector, given the very nature of the processing trade regime as discussed in subsection 2.4.

Figures 9.3 and 9.4 further break the processing trade into P&A and PWIM. Still the two figures resemble the sectoral patterns for processing trade (figure 9.2), with the Mach/Electrical sector contributing the most to Chinese trade surplus with the world for each of the two subregimes under the processing trade. In terms of magnitude, the surplus in Mach/Electrical sector under PWIM is almost five times as much as that under P&A. Again, it shows that exports under PWIM are the driving force behind the growing surplus with the world in Mach/Electrical sector

Trade balances with US follow the similar patterns.

2.10 TRADE BY FIRMTYPE

China has been liberalizing its restriction on trading rights. In the early years of

⁸ Hong Kong is excluded because large amount of goods enter Hong Kong with unknown final destinations and it will distort the China's true trade patterns with its neighbors.

reform, only government-sanctioned, state-owned trading companies had the rights to engage in international trade. With the exception of FFEs, producers had to sell their products to those trading companies. Over time, trading rights control was relaxed and more production companies were allowed to engage in international trade. With China's accession to the WTO, almost everyone can enter the business, except for some strategic commodities whose trading rights are reserved for a small number of state trading enterprises. On the other hand, as part of the incentive package to attract FDI, since the early years when China opened up, FFEs have been granted special privileges in handling foreign trade within a prescribed scope.

Given the above background clarification, Chinese foreign trade handled by *trading* companies, whose information are available in the data, should be interpreted as only a proxy for the trade handled by the *production* companies of the same type. Among various firm types, FFEs have the best proxies as they enjoyed trading rights throughout the period of 1995-2004. For privately and collectively owned companies (PrivCol), the proxies are improving over time.

From figures 10.1 and 10.2, we see foreign owned and the private and collectively owned trading companies were gaining momentum. On the export side, FFE surpassed the SOE in later years when the private and collectively owned firms (PrivCol) were also making headway. SOEs remained relatively stable over the ten years period. A similar pattern existed on the import side. In this regard, China-US trade showed no distinct difference.

In terms of the trade balance, however, China-World and China-US trade showed distinctly different patterns (figures 10.3 and 10.4). For China-World trade, the surplus for SOEs in early years was shrinking and slipped into deficit in later years, while the opposite movement was seen for FFEs. Private and collectively owned trading companies had almost balanced trade in 1995, but show a growing surplus, which becomes the largest of the three in later years.

For China-US trade, all types of firms were gaining in surplus except the "other" group which remained flat with balanced trade. The performance of SOEs was improved but only at a slow pace. They were caught up with by PrivCol in 2004, but both are still lagging far behind FFEs.

In summary, the increasingly important role of FFEs and PrivCol in Chinese foreign trade and particularly the generating surplus is an outcome of adjustment to trading rights reform as well as the improvement in production and exporting capacities of those companies. Trading rights liberalization also made it possible to better discern from the Customs data the true extent of the SOEs' role in the production of exports, which is second to FFEs and PrivCol combined.

2.11 TRADE BY SECTOR AND FIRMTYPE

Again, the significance of Mach/Electrical sector in China-US trade can be shown here in comparison with China-World trade, by breaking the trade data by firm type. For all three types of firms (SOEs, FFEs and PrivCol), as shown in figures 11.1~11.6, the relative contribution of the said sector to the trade surplus with the United States was more significant than that to China-World trade.

3. CONCLUSION

To sum up, Chinese foreign trade over 1995-2004 has the following key features:

- (1) The Yangtze Delta was catching up with Guangdong province in international trade. Hong Kong's role in China's foreign trade was diminishing and almost negligible for the Yangtze Delta, but still quite significant for Guangdong.
- (2) Machinery and electrical machinery and parts were the single most important product category that helped reshape Chinese foreign trade patterns, particularly in China-US trade. All indications suggest that rise of the sector in China's foreign trade was closely associated with the country's processing trade regime and the outcome of foreign outsourcing to China. It is difficult to find any evidence that the export surge of that sector represents technological upgrading in Chinese exports.
- (3) The processing trade regime and foreign trading companies were playing increasingly important roles in China's foreign trade development. Processing trade itself was increasingly dominated by the activities of processing with imported materials (PWIM) in recent years. China and its Asian neighbors were all part of the production chain that produces for the US market. China imports parts and components from its Asian neighbors and exports the processed goods to the United States.
- (4) Most of Chinese trade growth did not come from the specially designated zones, but from the nonzone areas. This finding confirms the argument in the literature that China's preferential policy towards export-oriented FFEs, regardless of their locations, was the key policy incentive for trade growth.

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Appendices

Appendix 1: Figures

Figure Series 1: Chinese Overall Foreign Trade Patterns

Figure 1.1 Total foreign trade (imports + exports)

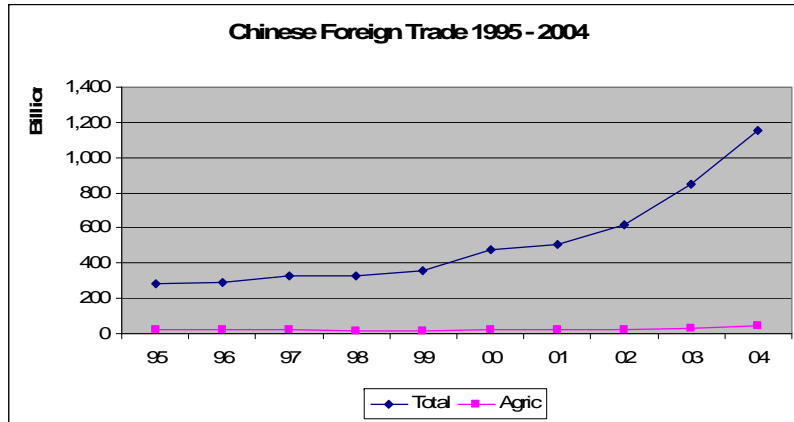


Figure 1.2 Trade balance with rest of the world (ROW)

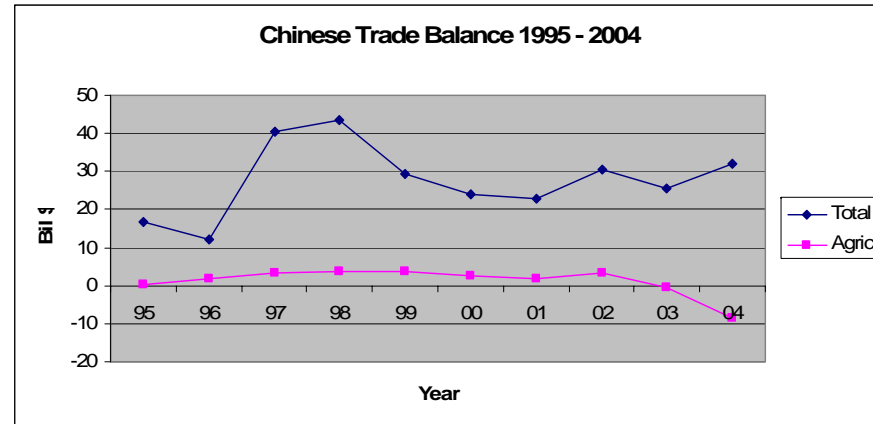


Figure 1.3 Trade balance by trading partners



Figure Series 2: Trade Distribution by Chinese Region

Figure 2.1 trade with row 9597

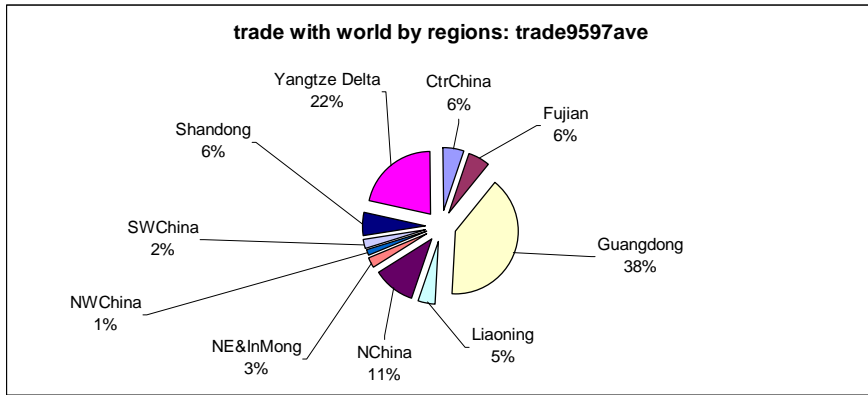


Figure 2.2 trade with ROW 0204

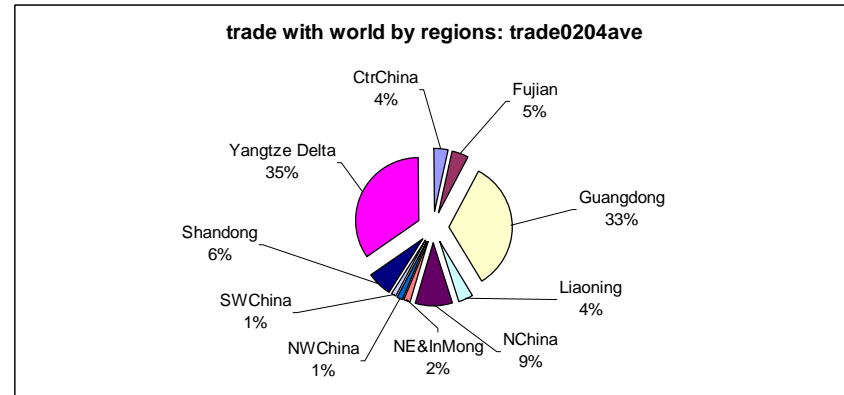


Figure 2.3 export to US 9597

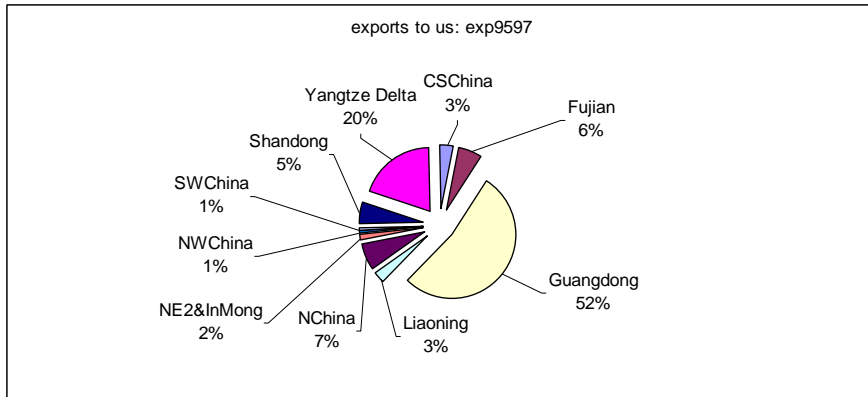


Figure 2.4 export to US 0204

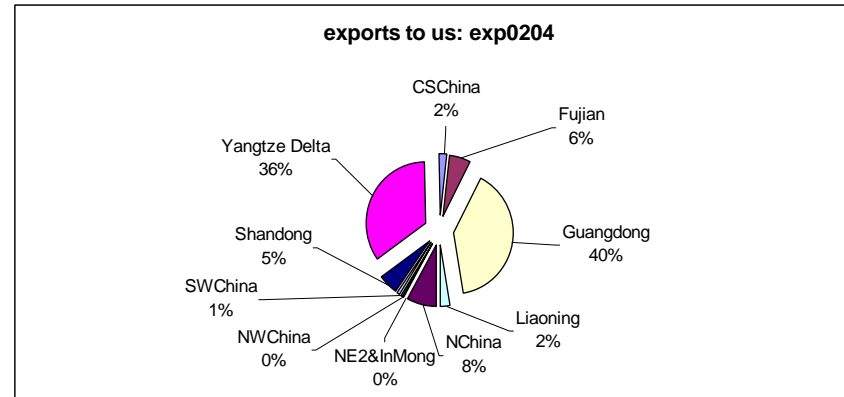


Figure Series 2: Trade Distribution by Chinese Region (continued)

Figure 2.5

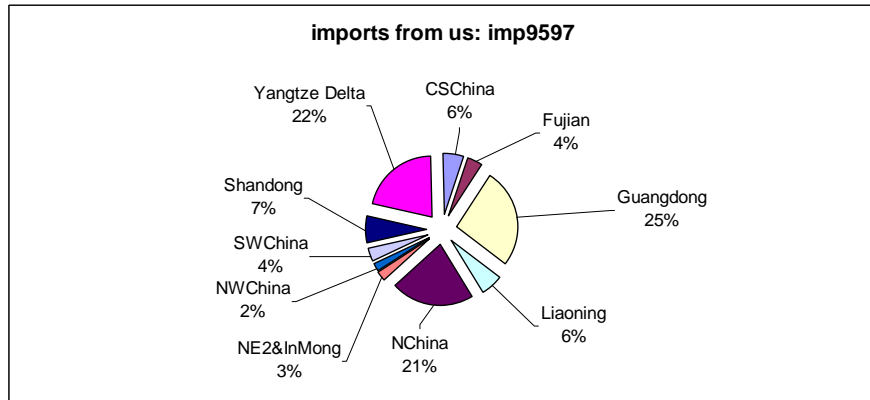


Figure 2.6

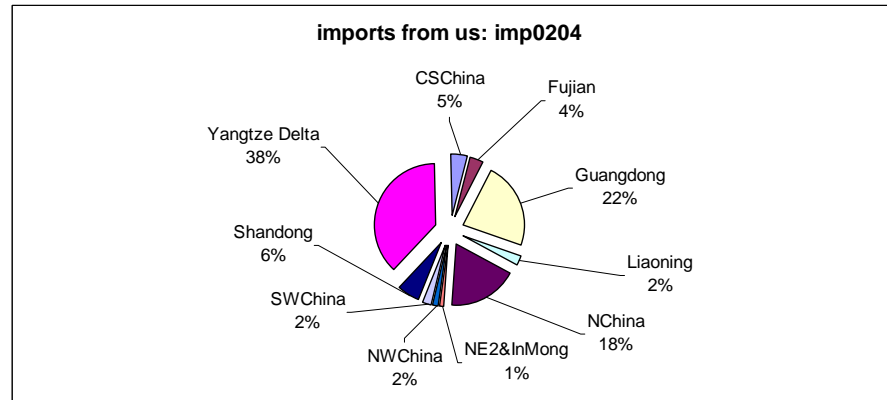


Figure 2.7

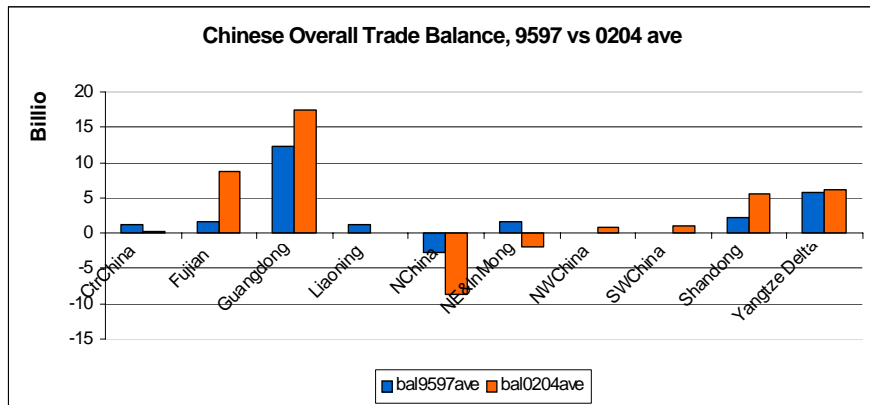


Figure 2.8

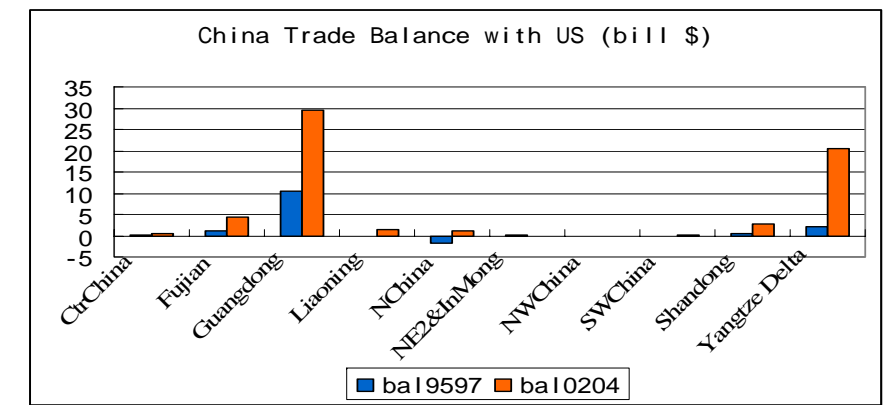


Figure Series 3: Hong Kong in Chinese Export

Figure 3.1 Chinese total exp to ROW w/ HK excluded, 9597

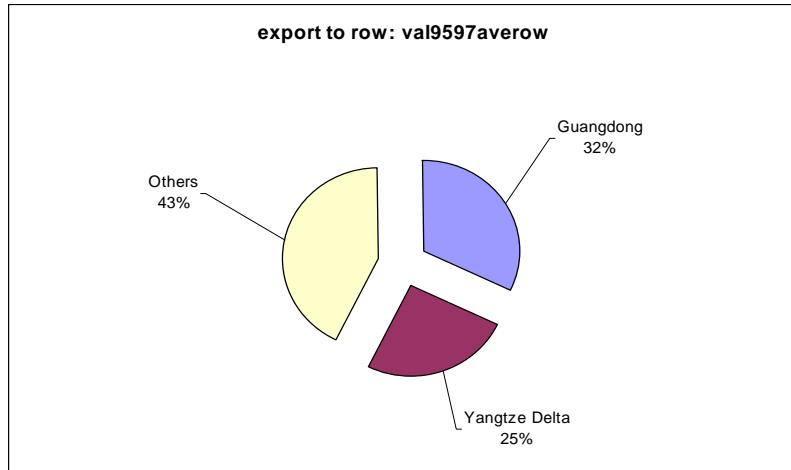


Figure 3.2 Chinese total exp to ROW w/ HK excluded, 0204

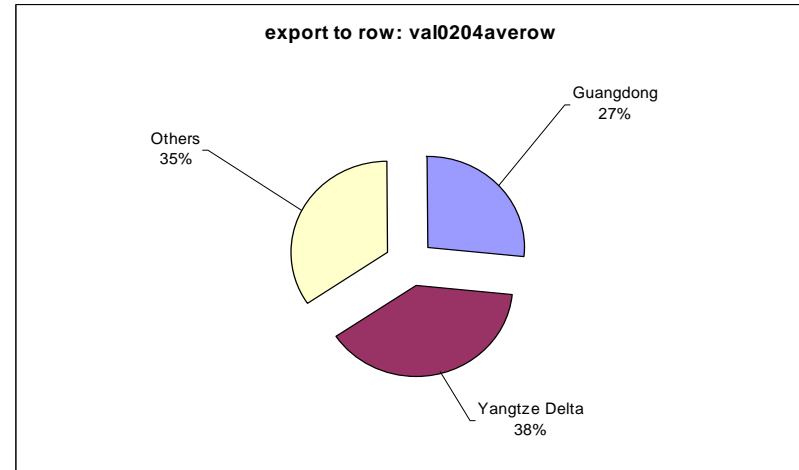


Figure 3.3 Chinese total export to US, 9597

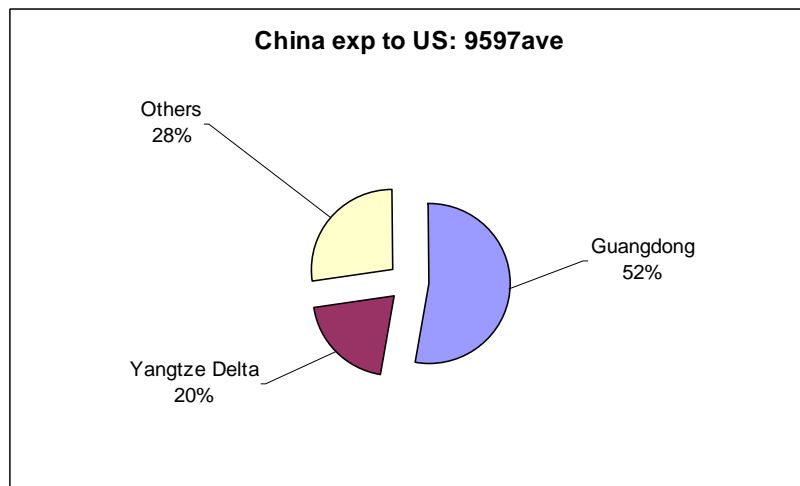


Figure 3.4 Chinese total export to US, 0204

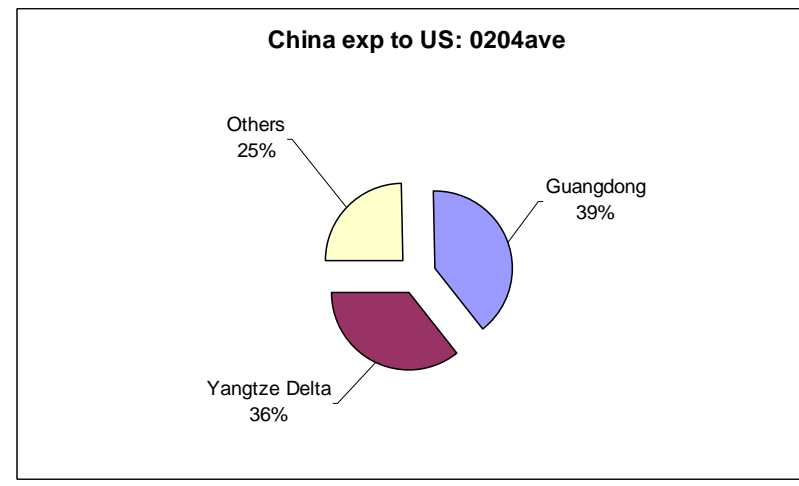


Figure Series 3: Hong Kong in Chinese Export (continued)

Figure 3.5 Regional Distribution of exp to ROW via HK, 9597

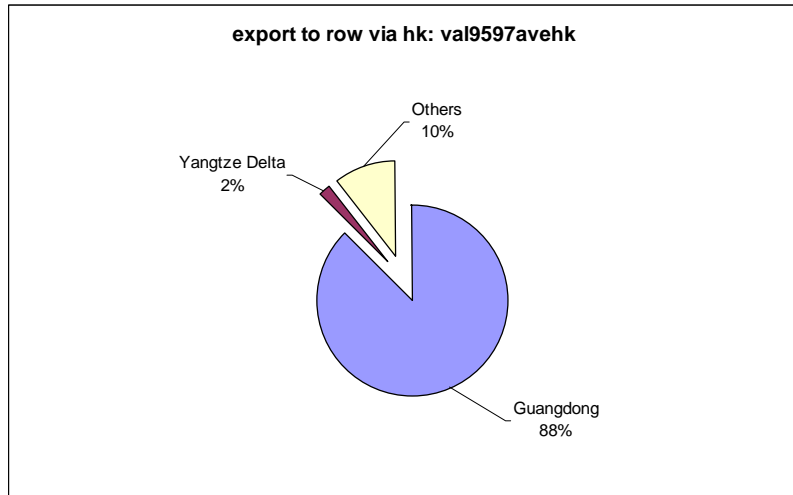


Figure 3.6 Regional Distribution of exp to ROW via HK, 0204

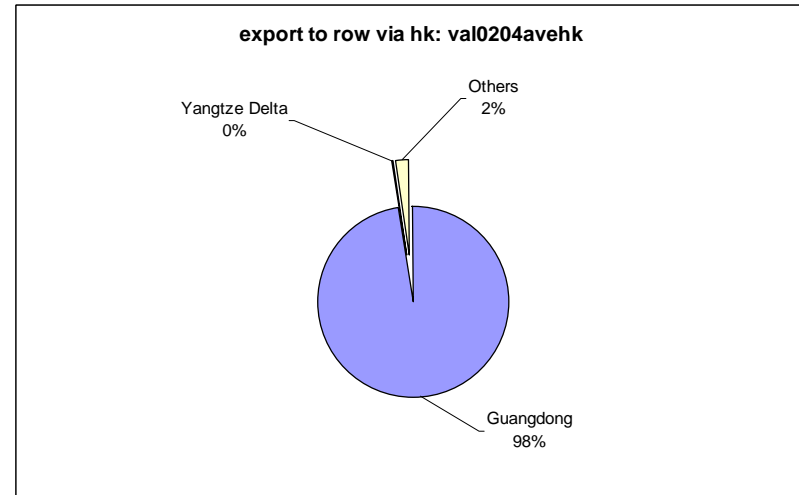


Figure 3.7 Share of exp to ROW via HK in its total exp to ROW

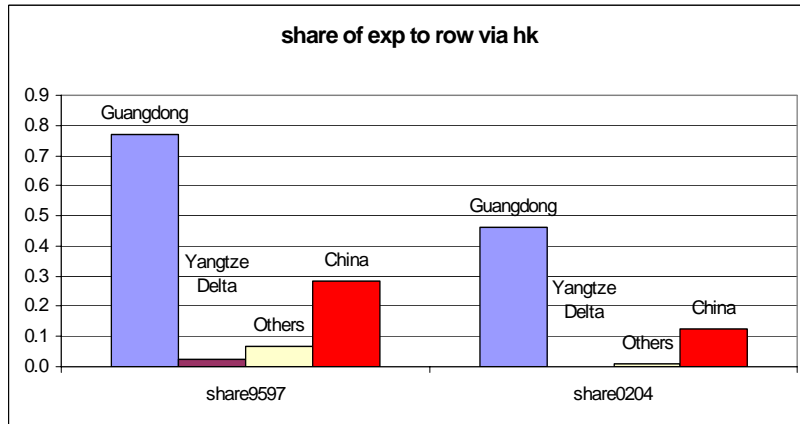


Figure 3.8 Share of exp to US via HK in its total exp to US

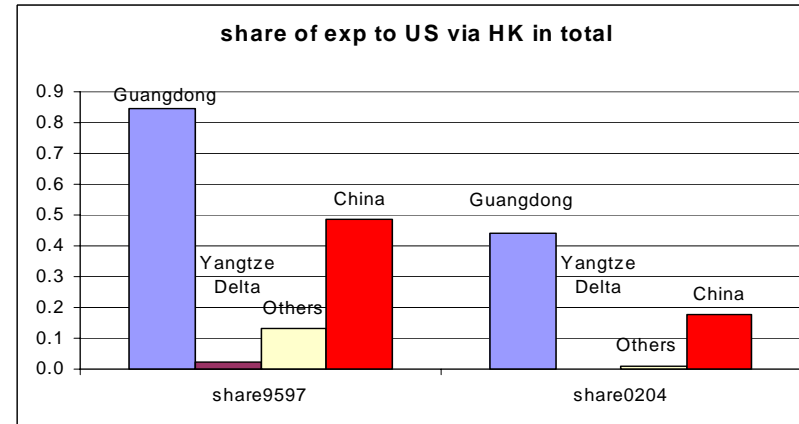


Figure Series 4: Hong Kong in Chinese Import

Figure 4.1 Total import from ROW w/ HK excluded, 9597

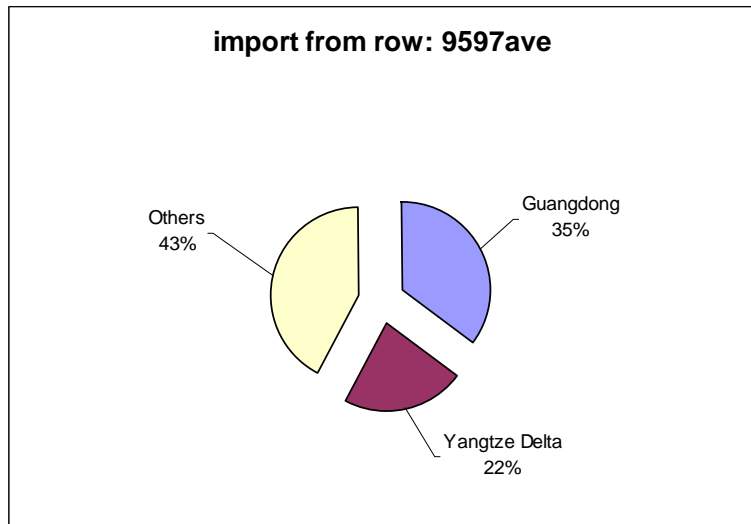


Figure 4.2 Total import from ROW w/ HK excluded, 0204

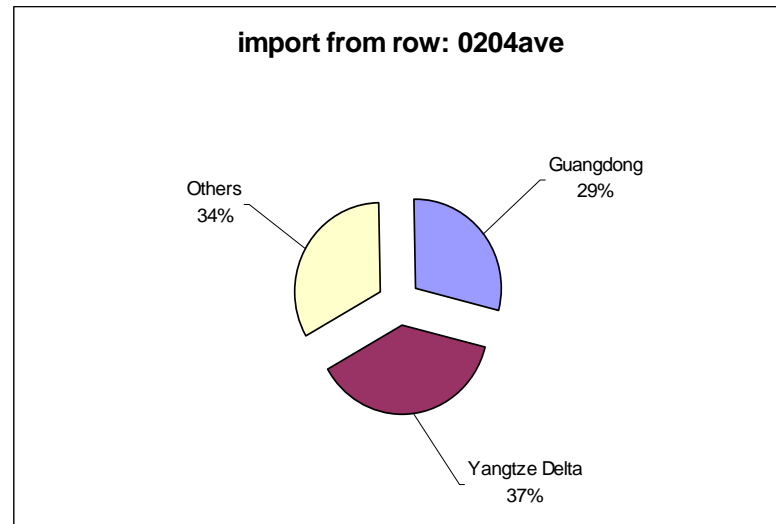


Figure 4.3 Chinese total import from US, 9597

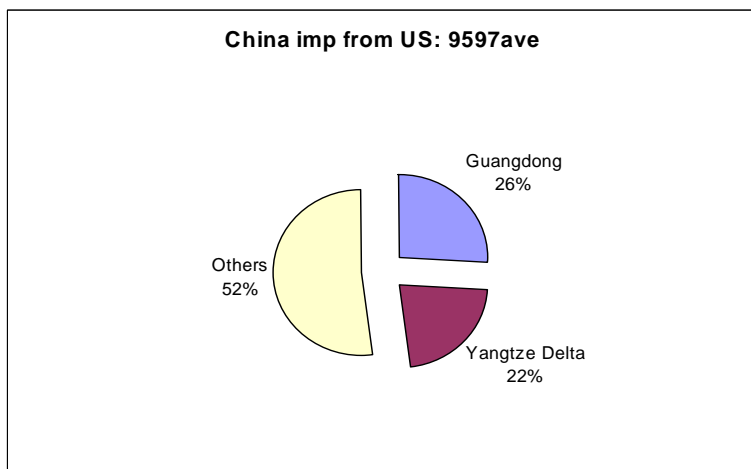


Figure 4.4 Chinese total import from US, 0204

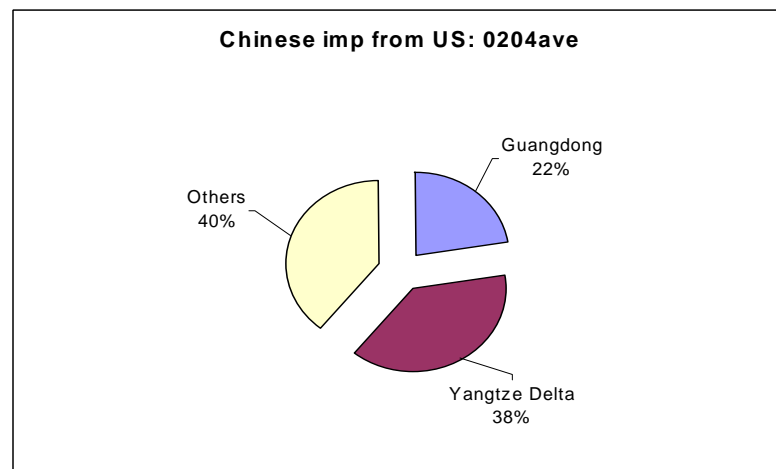


Figure Series 4: Hong Kong in Chinese Import (continued)

Figure 4.5 Regional Distribution of imp from ROW via HK, 9597

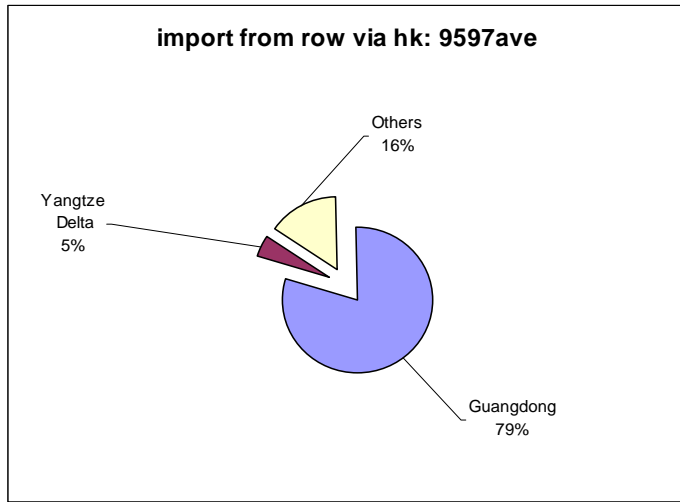


Figure 4.6 Regional Distribution of imp from ROW via HK, 0204

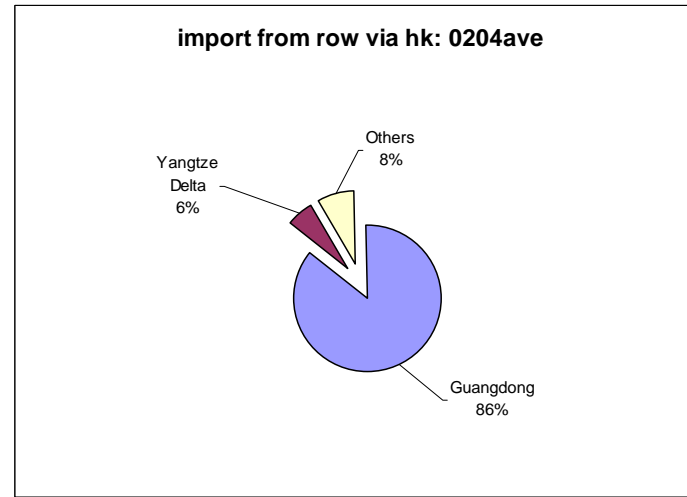


Figure 4.7 Regional Distribution of imp from US via HK, 9597

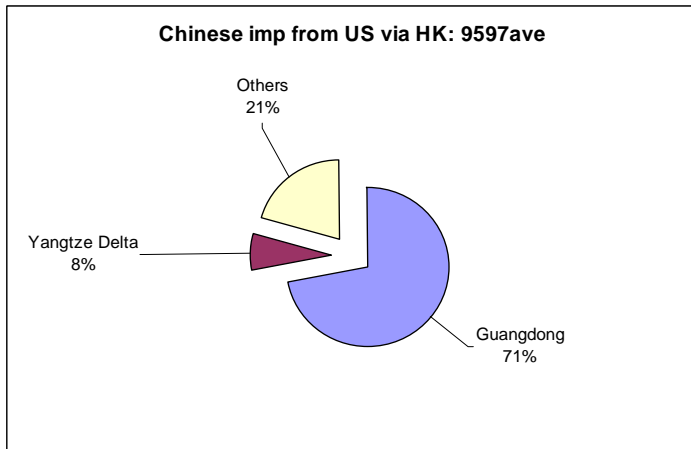


Figure 4.8 Regional Distribution of imp from US via HK, 0204

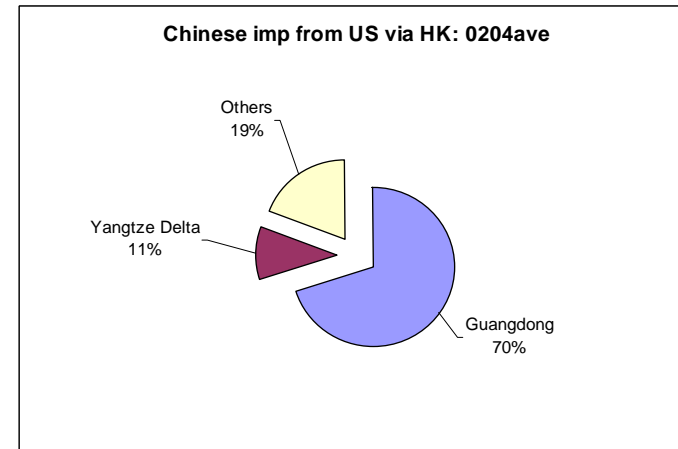


Figure Series 4: Hong Kong in Chinese Import (continued)

Figure 4.9 Share of imp fr ROW via HK in total imp fr ROW

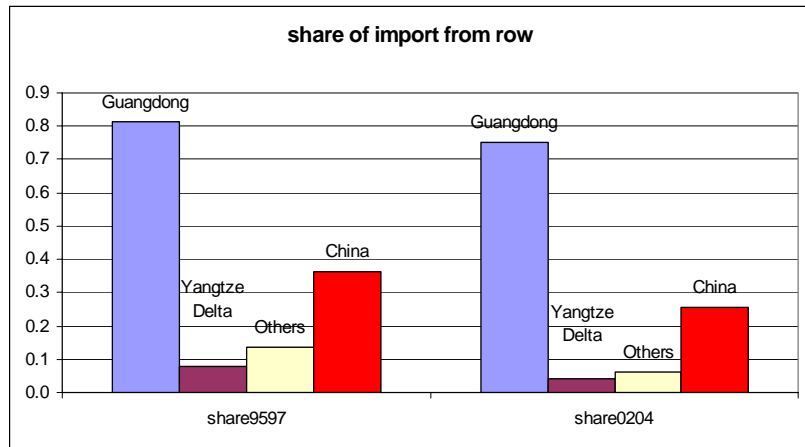


Figure 4.10 Share of imp fr US via HK in total imp fr US

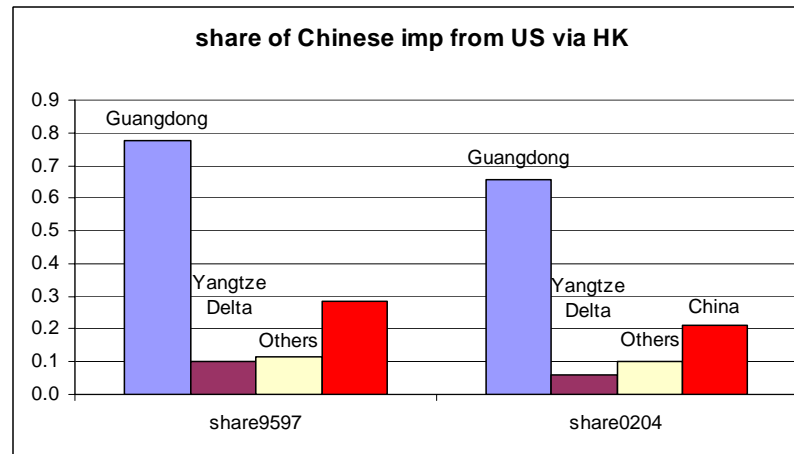


Figure Series 5: Chinese Foreign Trade by Zone

Figure 5.1 Exp to ROW by Zone

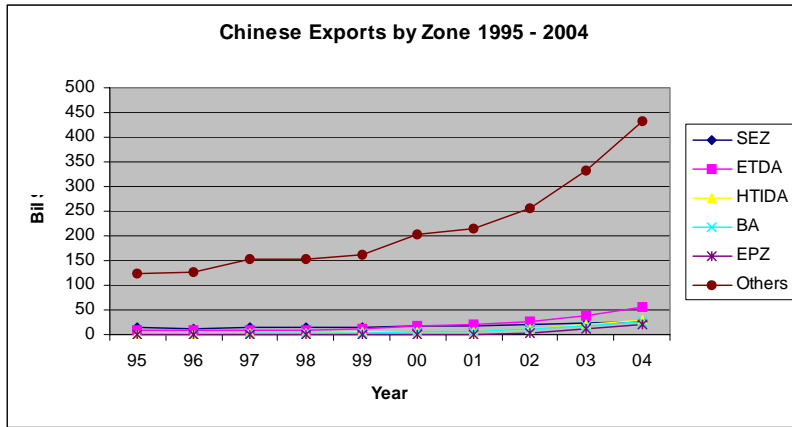


Figure 5.2 Imp from ROW by Zone

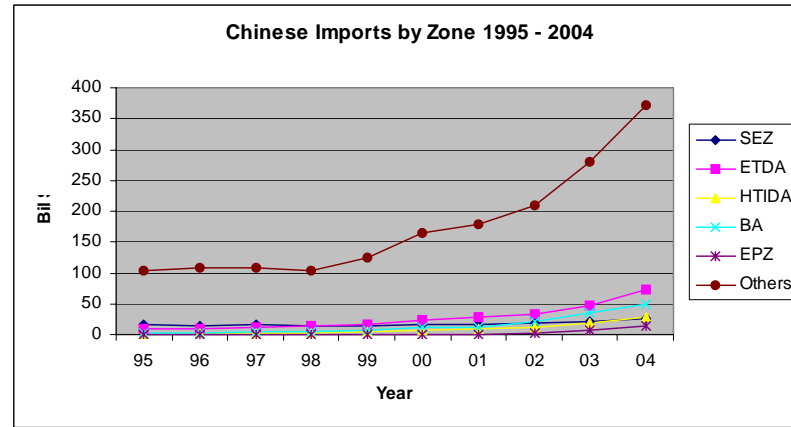


Figure 5.3 Trade Balance with ROW by Zone

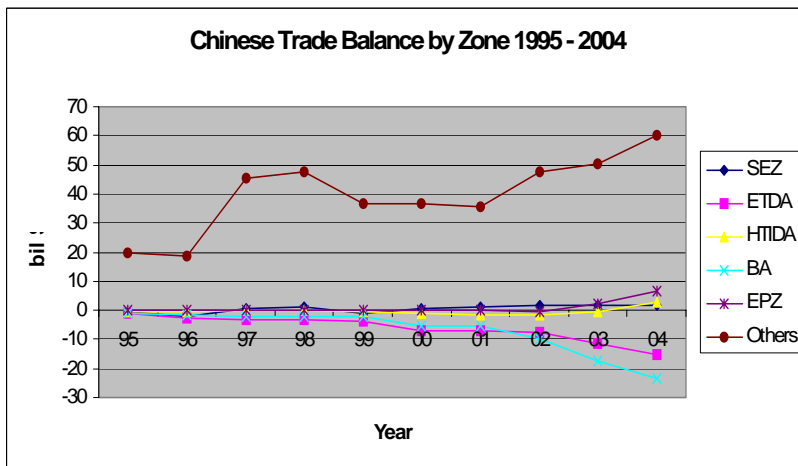


Figure 5.4 Trade Balance with US by Zone

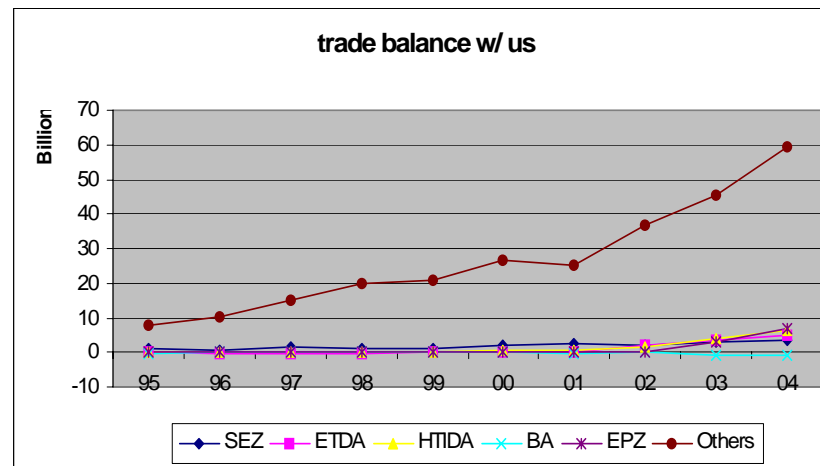


Figure Series 6: Chinese Foreign Trade by Sector

Figure 6.1 Exp to ROW by Sector, 9597

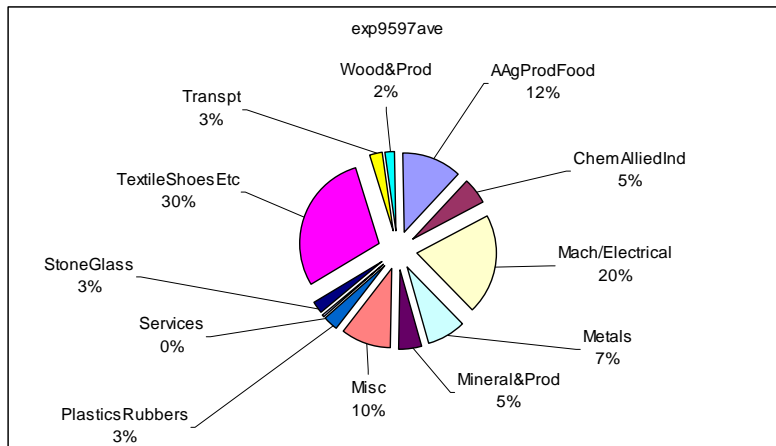


Figure 6.2 Exp to ROW by Sector, 0204

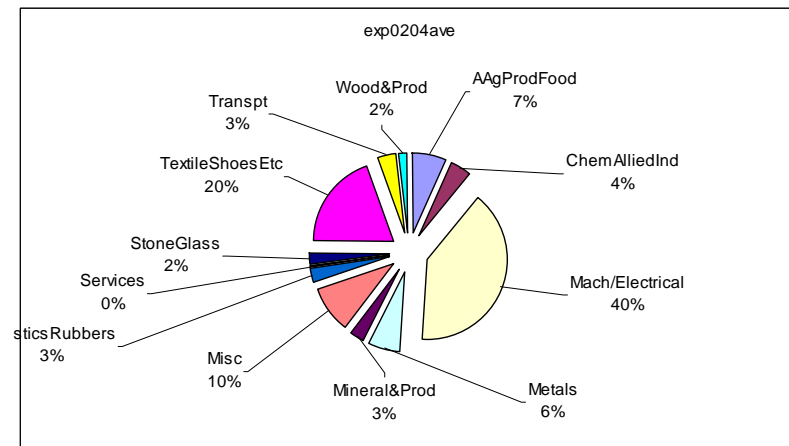


Figure 6.3 Imp from ROW by Sector, 9597

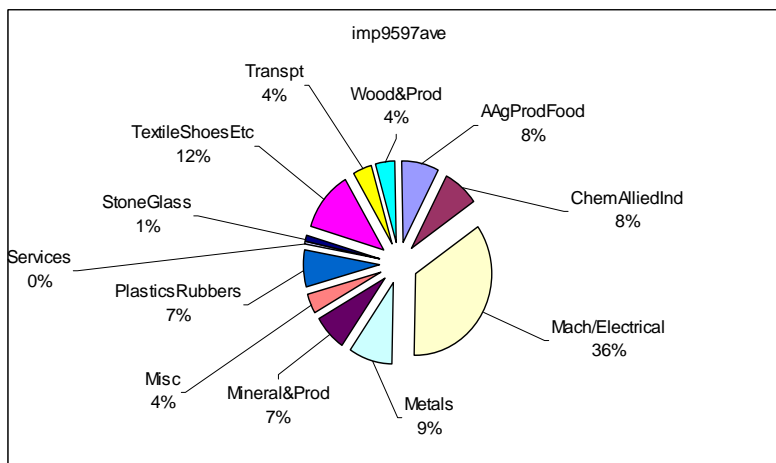


Figure 6.4 Imp from ROW by Sector, 0204

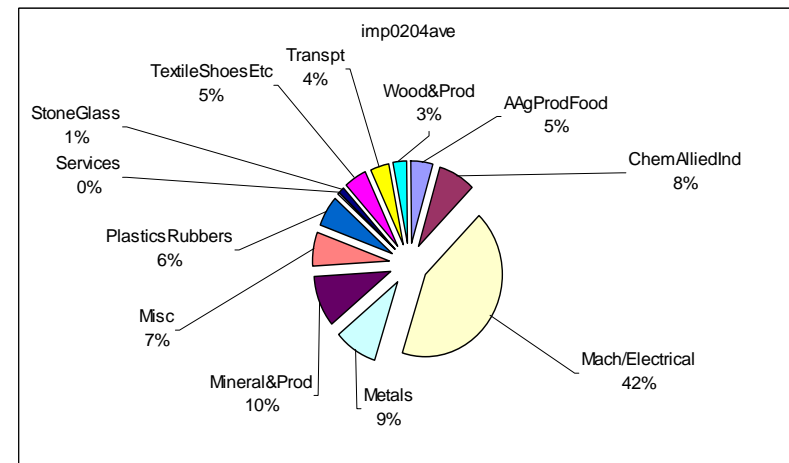


Figure Series 6: Chinese Foreign Trade by Sector (continued)

Figure 6.5 Trade balance with ROW

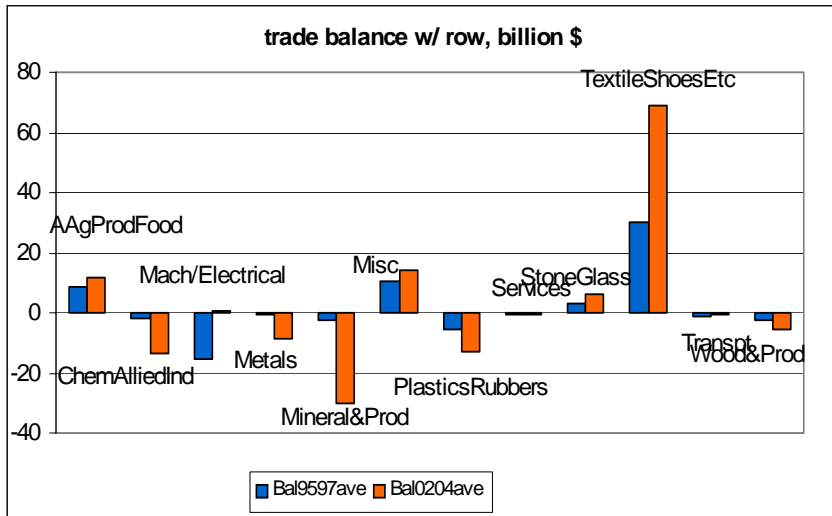


Figure 6.6 Trade Balance with US

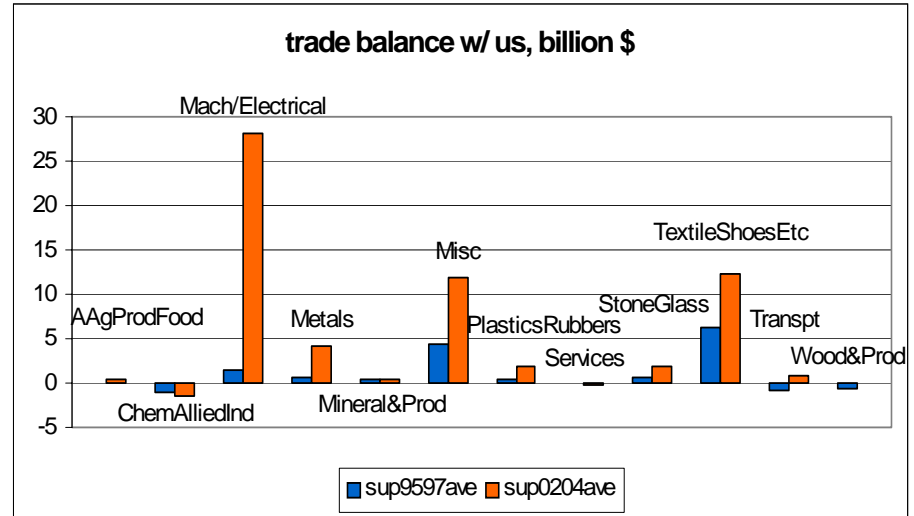


Figure Series 7: Chinese Trade Balance by Zone and Sector

Figure 7.1 Trade balance with ROW for Non-zone

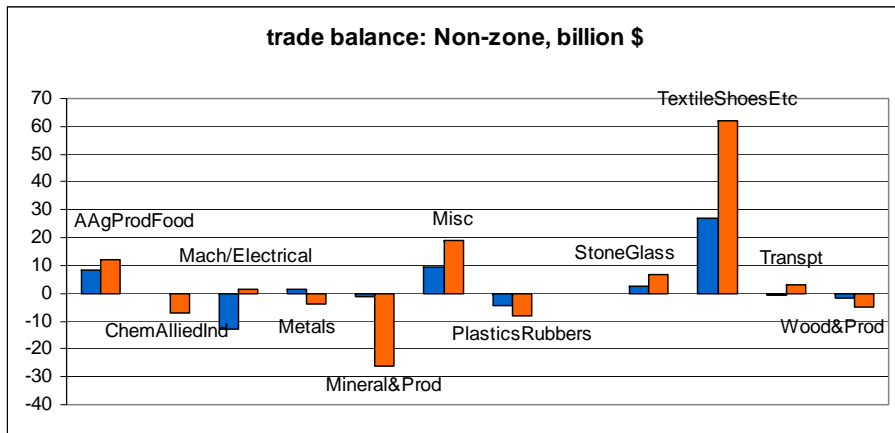


Figure 7.2 Trade balance with US for Non-zone

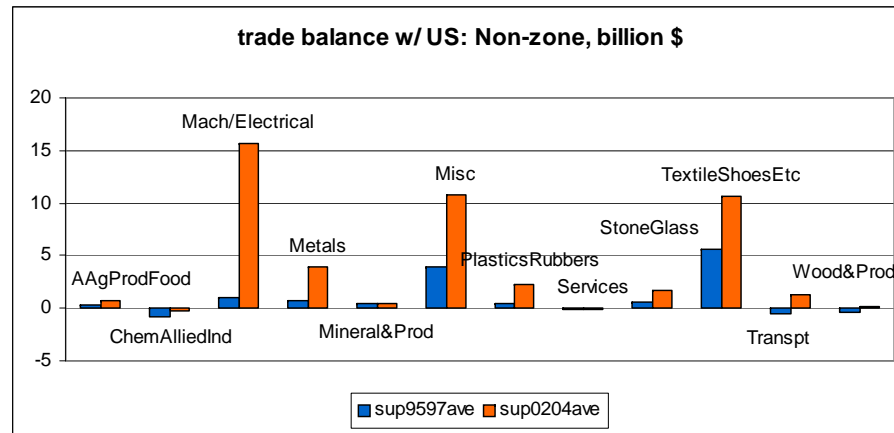


Figure 7.3 Trade balance with ROW for ETDA

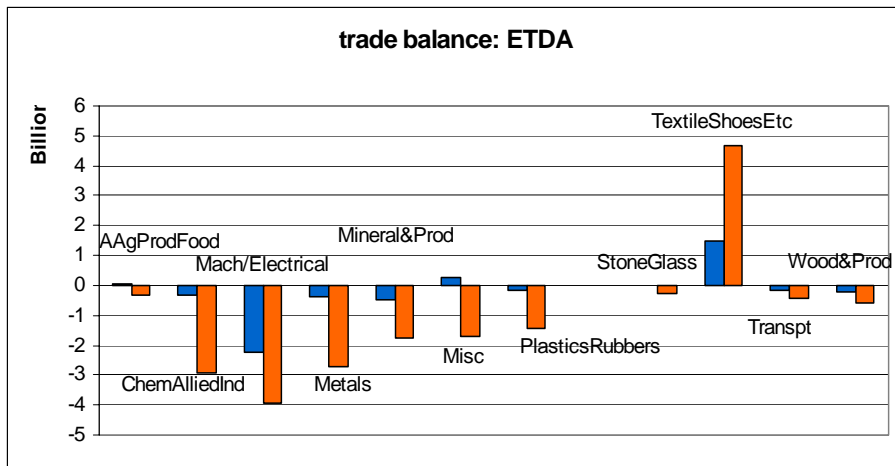


Figure 7.4 Trade balance with US for ETDA

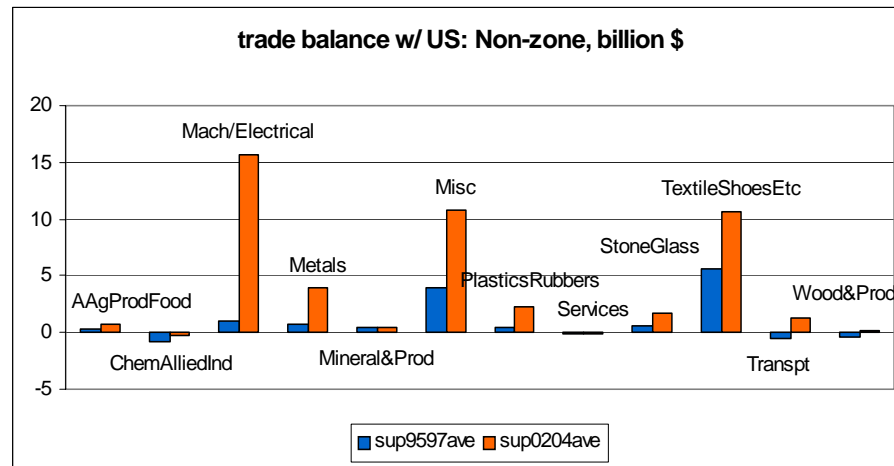


Figure Series 7: Chinese Trade Balance by Zone and Sector (continued)

Figure 7.5 Trade balance with ROW for BA

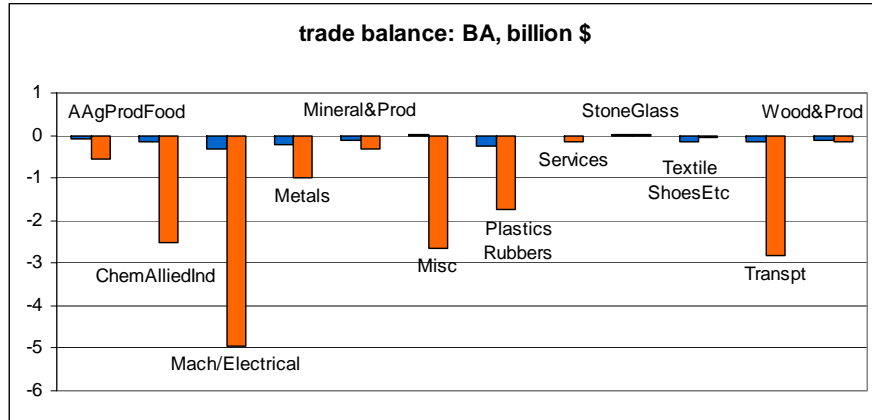


Figure 7.6 Trade balance with US for BA

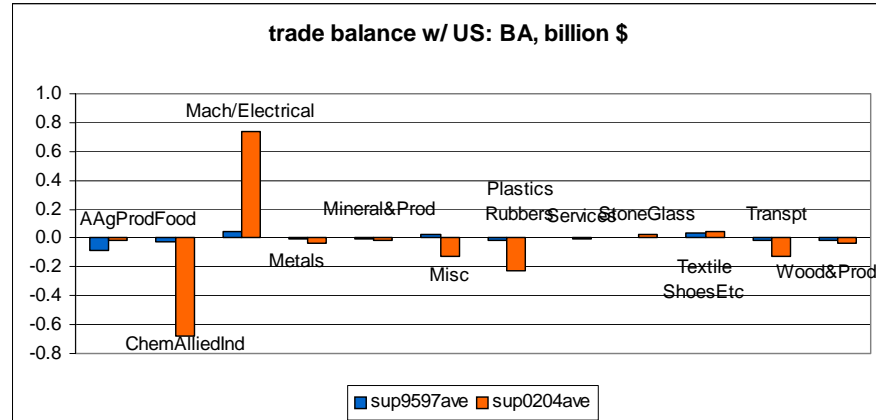


Figure Series 8: Chinese Foreign Trade by Customs Regime

Figure 8.1

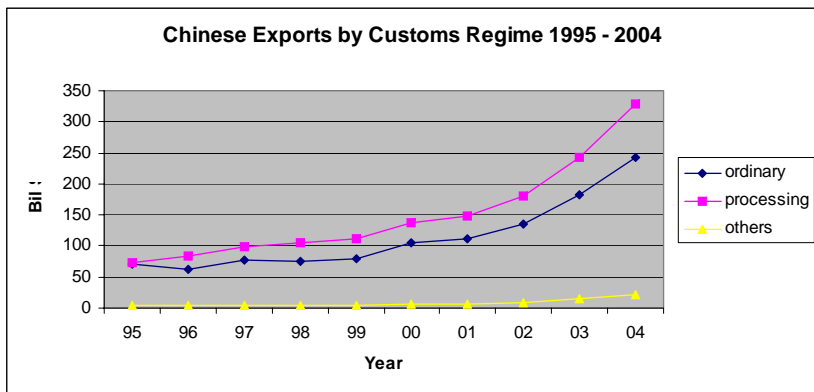


Figure 8.2

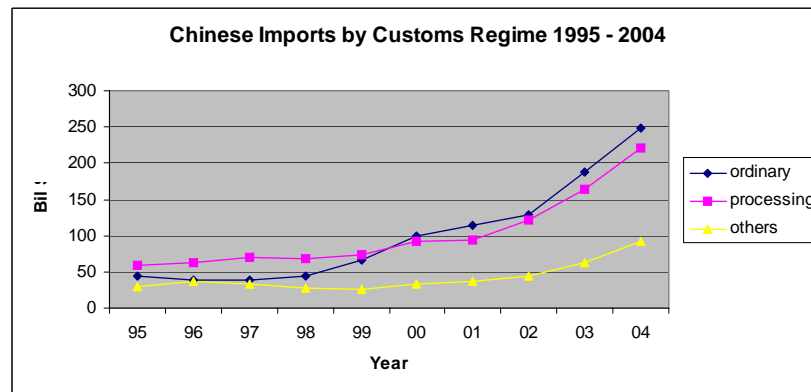


Figure 8.3

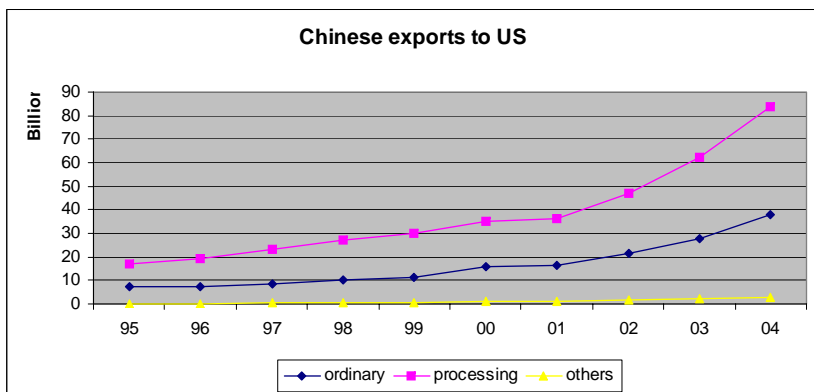


Figure 8.4

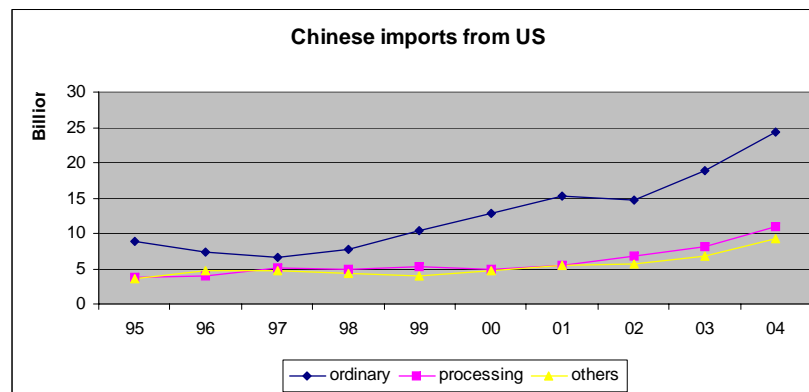


Figure Series 8: Chinese Foreign Trade by Customs Regime (continued)

Figure 8.5

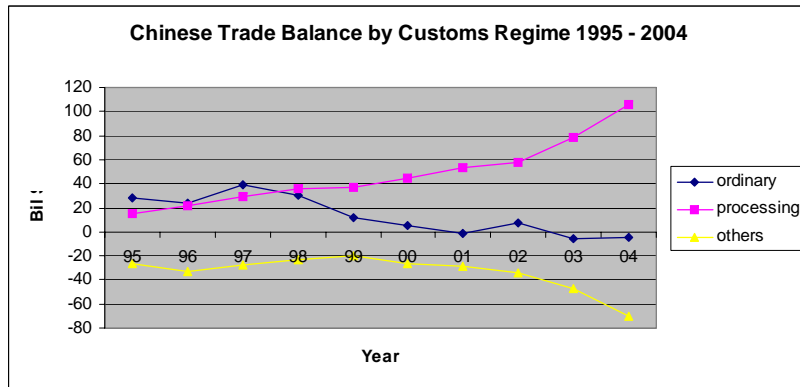


Figure 8.6

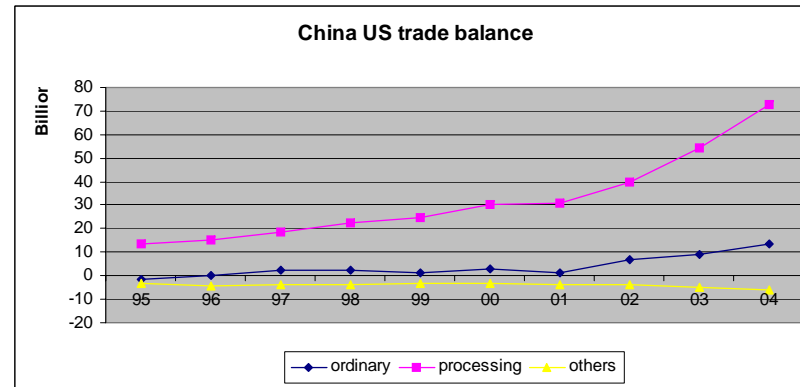


Figure 8.7

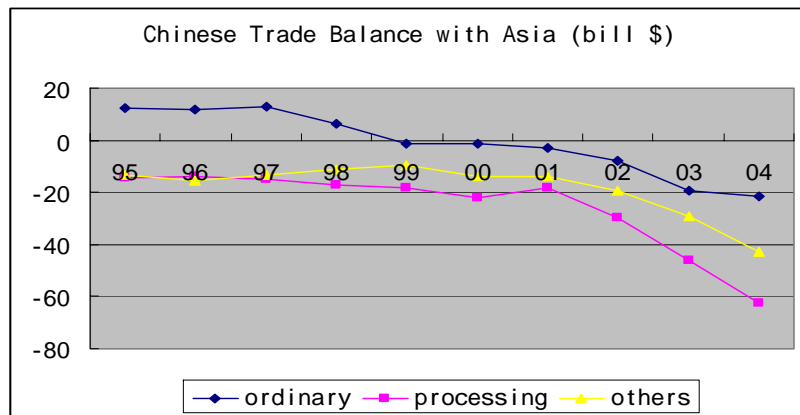


Figure Series 8: Chinese Foreign Trade by Customs Regime (continued)

Figure 8.8: China Asia Trade Balance by P&A and PWIM

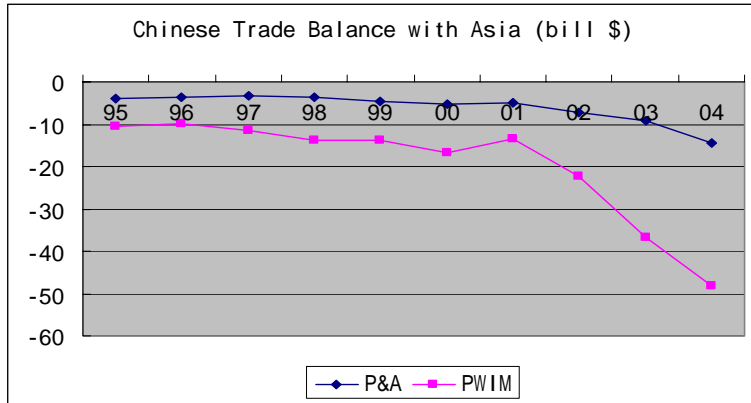


Figure 8.9 China US Trade Balance by P&A and PWIM

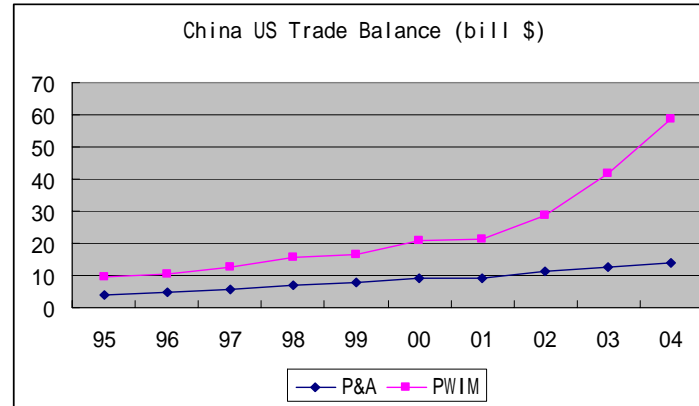


Figure Series 9: Chinese Trade Balance by Customs Regime and Sector

Figure 9.1 Trade balance with ROW for ordinary trade

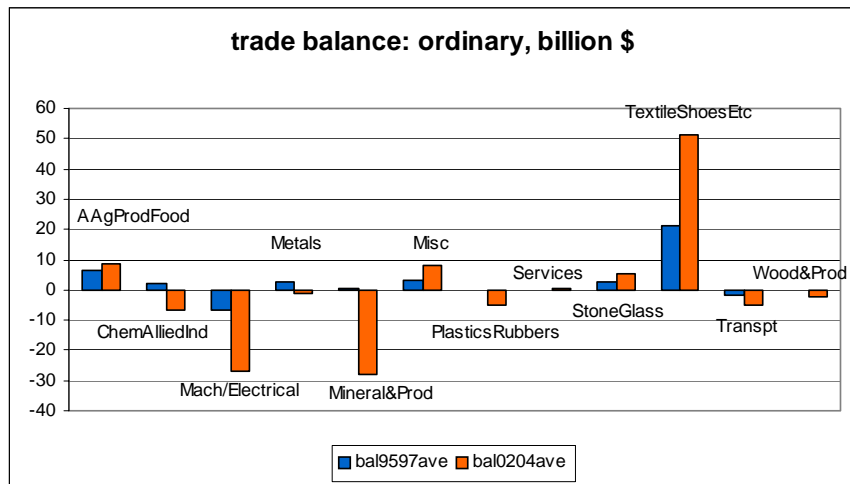


Figure 9.2 Trade balance with ROW for processing trade

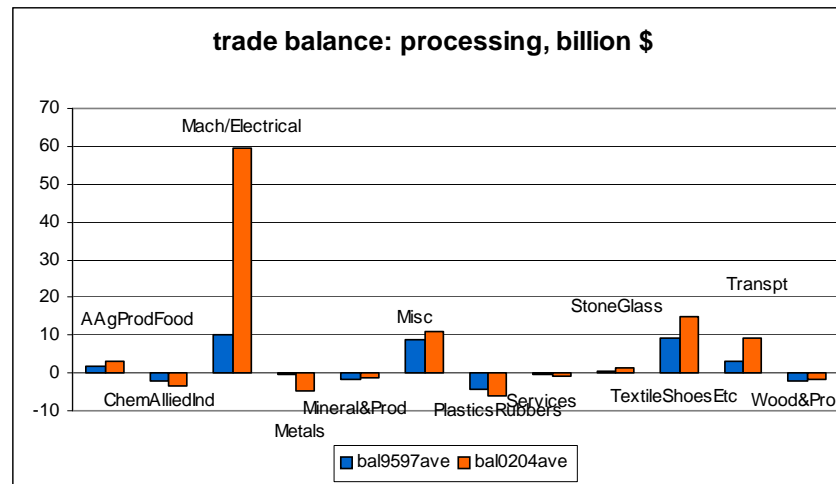


Figure 9.3 Trade balance with ROW for "Others" trade regime

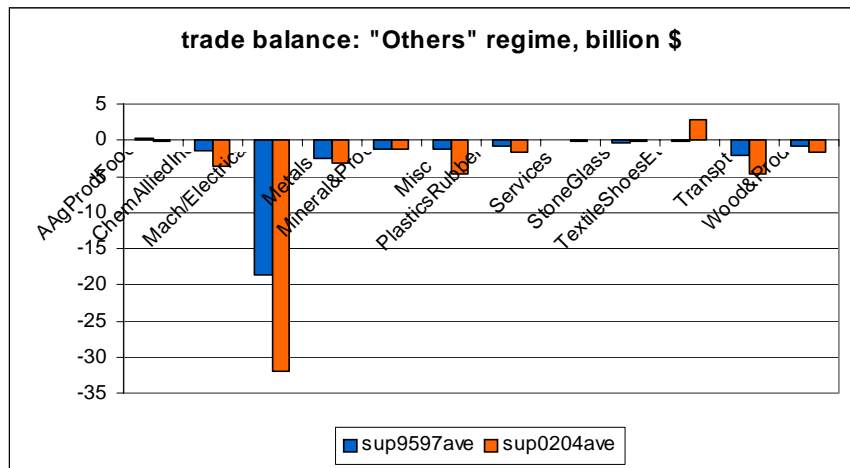


Figure Series 9: Chinese Trade Balance by Customs Regime and Sector (continued)

Figure 9.4

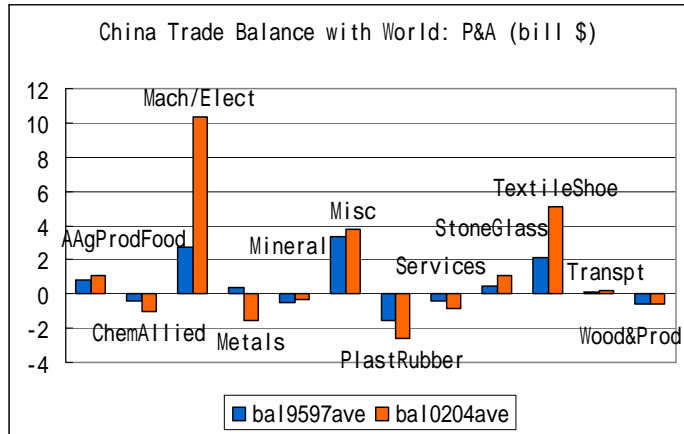
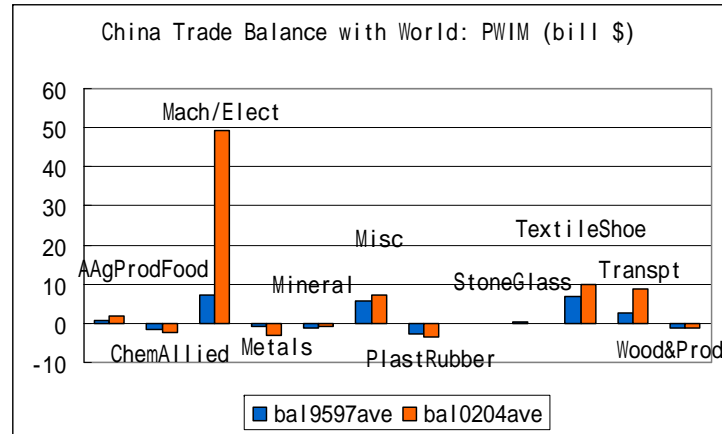


Figure 9.5



Note: Trade balances with US follow the similar patterns.

Figure Series 10: Chinese Trade by Firmtype

Figure 10.1 Exports to ROW by firmtype

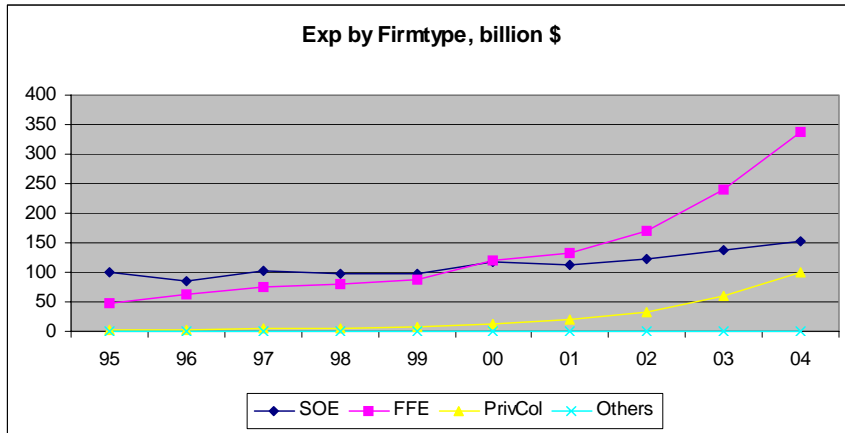


Figure 10.2 Imports from ROW by firmtype

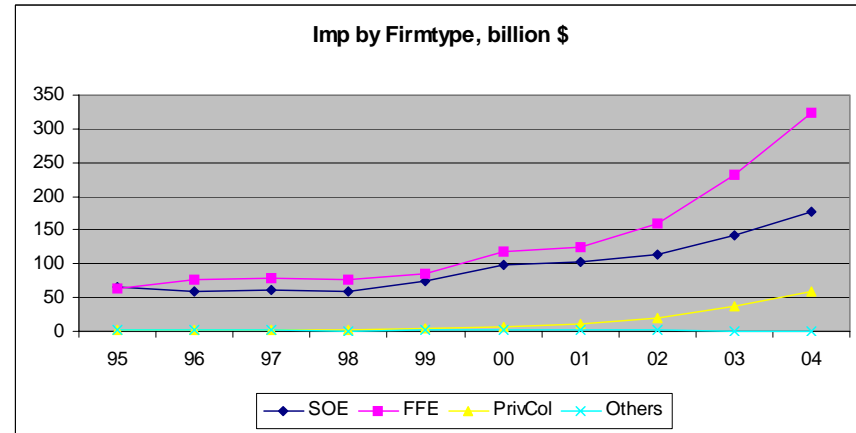


Figure 10.3 Trade balance with ROW by firmtype

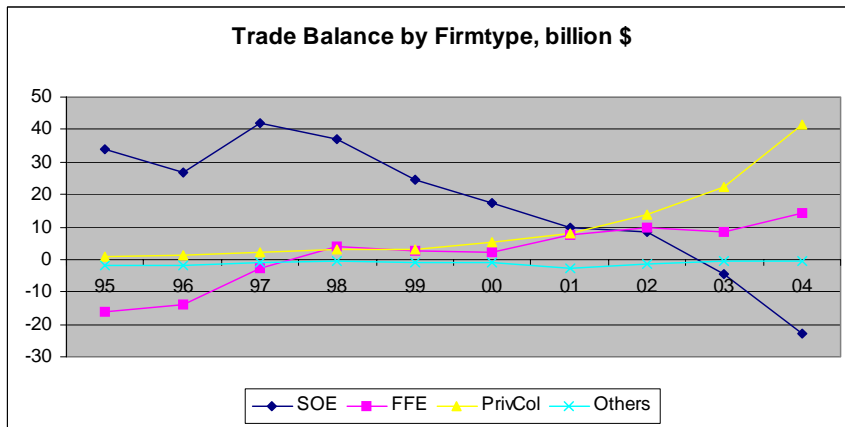


Figure 10.4 Trade balance with US by firmtype

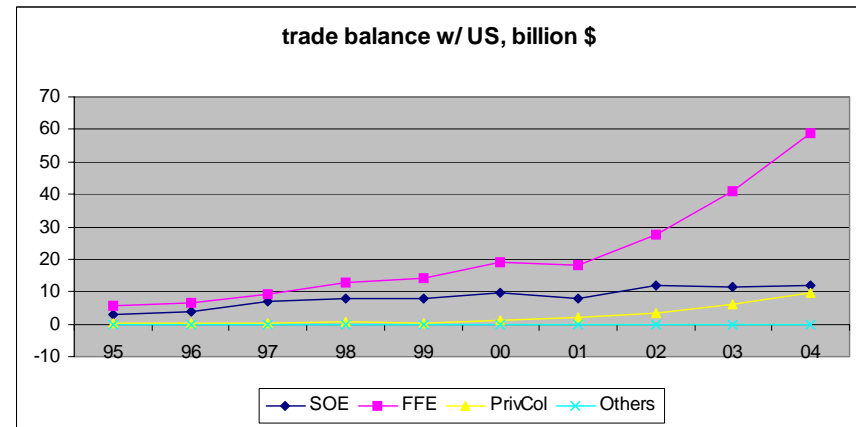


Figure Series 11: Chinese Trade by Sector and Firmtype

Figure 11.1 Trade balance with ROW, SOE

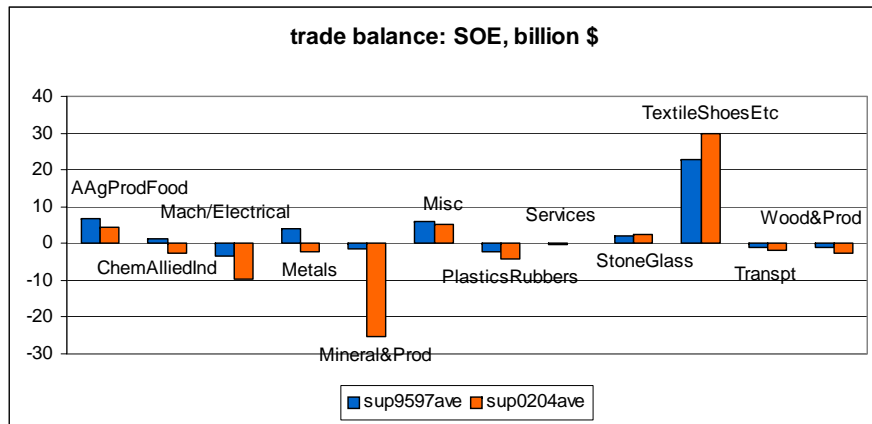


Figure 11.2 Trade balance with US, SOE

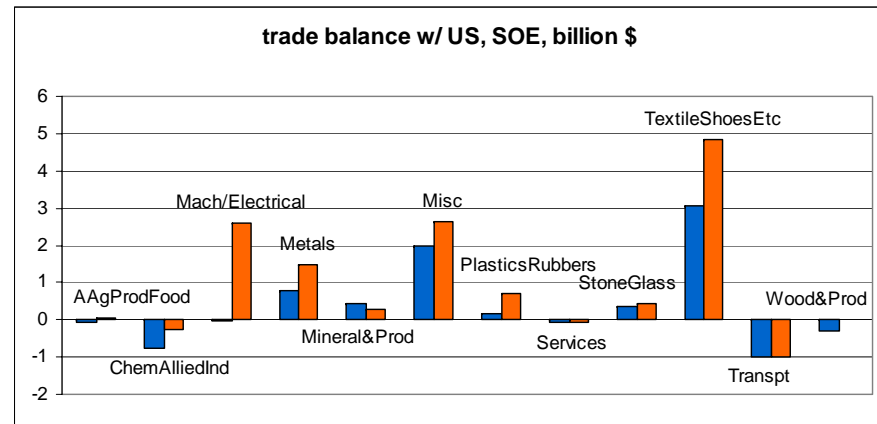


Figure 11.3 Trade balance with ROW, FFE

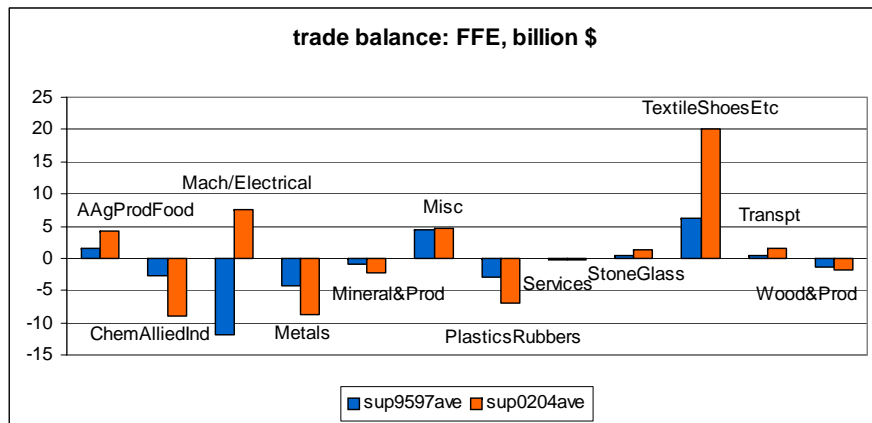


Figure 11.4 Trade balance with US, FFE

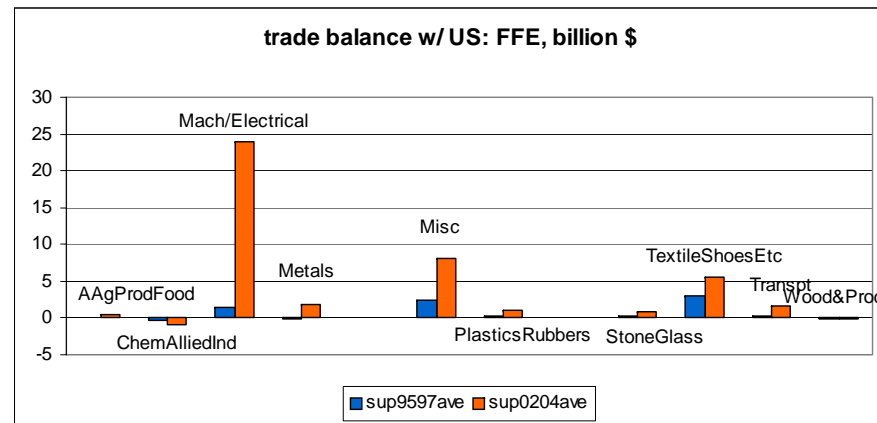


Figure Series 11: Chinese Trade by Sector and Firmtype (continued)

Figure 11.5 Trade balance with ROW, Private and Collective

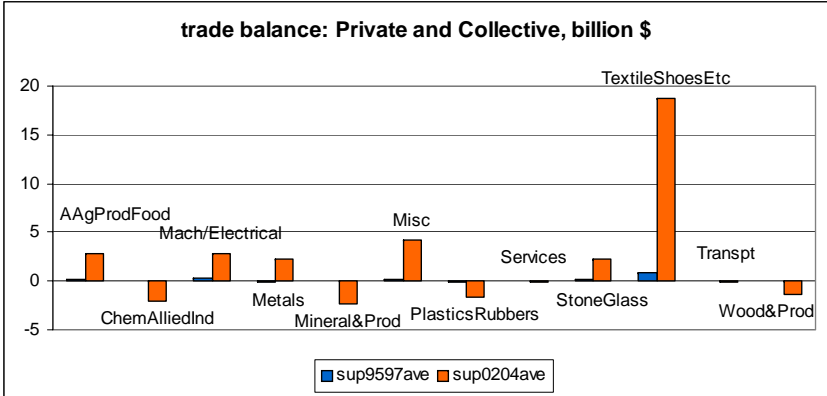
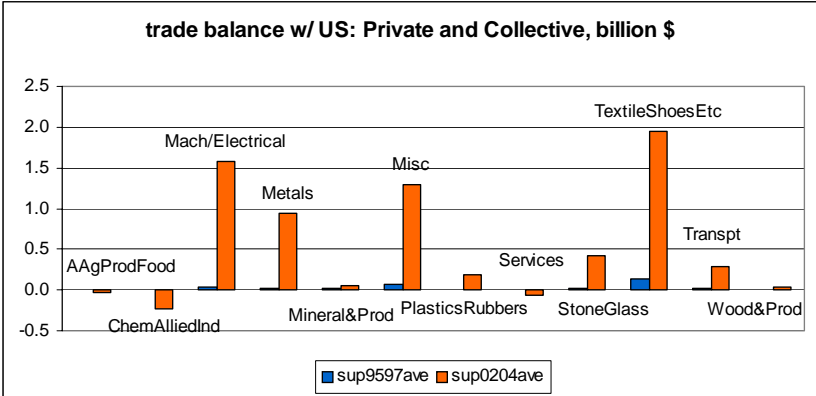


Figure 11.6 Trade balance with US, Private and Collective



Appendix 2: Region Grouping Scheme

Yangtze Delta	Shanghai, Jiangsu and Zhejiang
Northern China (NChina)	Beijing, Tianjin, Hebei and Shanxi
Southwestern China (SWChina)	Chongqing, Sichuan, Guizhou, Yunnan and Tibet
Northwestern China (NWChina)	Shaanxi, Gansu, Qinghai, Ningxia and Xinjiang
Central China (CtrChina or CSChina)	Henan, Hubei, Hunan, Guangxi, Hainan, Anhui and Jiangxi
Northeastern China Two Provinces and Inner Mongolia (NE2InMong)	Heilongjiang, Jilin and Inner Mongolia

Appendix 3: Sector Grouping Scheme

2-digit HS	Descriptions (Abbreviation)
01-24, 41-43	Animal and Agricultural Products and Foodstuffs (AAgProdFood)
25-27	Mineral Products (Mineral&Prod)
28-38	Chemicals & Allied Industries (ChemAlliedInd)
39-40	Plastics / Rubbers (PlasticsRubbers)
44-49	Wood & Wood Products (Wood&Prod)
50-67	Textiles, Footwear and Headgear (TextilesShoesEtc)
68-71	Stone / Glass (StoneGlass)
72-83	Metals
84-85	Machinery, Electrical Machinery and Parts (Mach/Electrical)
86-89	Transportation (Transpt)
90-97	Miscellaneous (Misc)
98-99	Services

The above grouping scheme is a slightly revised version of the one found at

<http://www.foreign-trade.com/reference/hscode.htm>