

Part II

Case Studies

4. Trade liberalization and international production networks: The automotive industry in China

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International production networks (IPN) in Asia cannot be considered without taking into account the important role that China plays within such networks. The integration of China into the global economy, particularly in East Asia, has raised international production fragmentation to unprecedented levels (Haddad, 2007; and Athukorala, 2007). At the start of the 2000s, China's processing exports (those that are produced from processing and/or assembly of imported inputs) accounted for nearly half of its total exports. In 2006, 51.5 per cent of China's intra-East Asian trade was in machinery products, of which more than half comprised parts and components. The rate of annual growth in parts and components with its East Asian partners between 1993 and 2006 was a significant 22.7 per cent (Kimura and Obashi, 2008). The drivers of IPN proliferation, as already described in preceding chapters of this publication, can be clearly observed in China. Three drivers of this process, as explained by Ernst and Kim (2002), can be expanded for the case of China:

- (a) The economic reform process that started in China in the late 1970s resulted in trade liberalization, more openness to foreign direct investment and the privatization of thousands of state-owned enterprises;¹
- (b) Coupled with relatively lower labour costs and artificially weak exchange rates, the opening up of China provided MNCs with an avenue to drastically reducing their production costs.² Unsurprisingly, the low inflation rates experienced by the world in the late 1990s to early 2000 can be partially attributed to China's low cost production opportunities, which became a powerful factor in attracting for MNCs to relocate labour-intensive production to China. Assembly operations were dominant in the early part of China's reform era; however, from the late 1980s, China became host to numerous independent suppliers who fell within the IPNs of popular brand names such as Bosch, GAP and Nike;
- (c) The rapid development of information and communications technology (ICT) and infrastructure played an important role in China, as it did in many other developing countries. The investment made by the Government of China in infrastructure allowed MNCs to reduce their own costs and associated risks.³

¹ China's simple average tariff rate was 42.9 per cent in 1992, but dropped to 9.7 per cent in 2005 (World Trade Organization, 2008).

² In 2002, the average hourly compensation for manufacturing workers in China was 3 per cent of that received by American workers (Banister, 2005). The undervaluation of the Chinese currency varies from close to parity to 40 per cent, based on different studies (*The Economist*, 2009).

³ In 2007, for example, the number of Internet users per 100 persons was 15.9 compared with 1.8 in 2000, while the number of fixed and mobile phone subscribers increased from 18 per 100 persons to 69 within the same time period (World Bank, 2008).

ICT allowed firms to maintain constant communication with their outposts in China, and in many cases reduced production lead time, particularly when it came to the transfer of designs.

The proliferation of regional trading agreements in East Asia also gained its impetus in China. An invitation by former Chinese premier Zhu Rongji in 2000 to ASEAN to establish an FTA between China and ASEAN opened the doors for numerous other regional and bilateral FTAs among countries in the region. China itself is involved in 13 trade agreements, the latest being the China-Pakistan Agreement on Trade in Services and the China-Peru FTA.⁴

The objective of this chapter is to consider the role, if any, of RTAs in the growth of IPNs in China. Without a doubt, IPNs preceded RTAs. However, with the uncertainty associated with the prolonged negotiations under the WTO Doha Round, additional regional agreements can be expected, while existing ones might expand in depth and scope. Thus, the objective here is to consider these factors that are important to these RTAs and which could therefore encourage greater use of IPNs in China. This is done by considering the automotive sector in China. First, the IPNs are considered from a macro perspective by evaluating the patterns and growth of trade in parts and components within the automobile sector in China. Some major policies that resulted in the change in those patterns of trade are highlighted. Second, the IPNs are evaluated from a micro perspective through a case study of several players within the IPNs. The objective is to identify factors that influence decision-making as well as the challenges faced by firms vis-à-vis RTAs. By taking into account both macro and micro perspectives, it is possible to highlight issues that need to be considered seriously by policymakers for RTAs to become an important driver of IPNs.

4.1. Bilateral and regional trading agreements involving China

China is a party to 13 FTAs, of which 10 are in force and three more are under negotiation (APTIAD). Some of the FTAs and other arrangements in which China is involved are detailed below.⁵

Asia-Pacific Economic Cooperation (APEC): As with other countries that border the Pacific Ocean, the Asia-Pacific region hosts China's most important trading partners and investors. China became a member of the APEC forum in November 1991 and submits an annual Individual Action Plan (IAP) that provides a roadmap of its intended actions in various policy areas, with a view to realizing APEC's (voluntary) liberalization goals. In 2001, China joined the APEC Business Travel Card (ABTC) Scheme and started to issue ABTC cards starting from November 2003. In a previous summit in Peru, China joined other members in confirming their support for the global free trade agenda.

⁴ The terms RTA and FTA can be used interchangeably with the term preferential trade agreement. Therefore RTA and FTA refer to any type of reciprocal exchange of discriminatory trade concessions between two or more countries, as also defined in chapter 3.

⁵ The agreements listed are based on those reported in "Trade Policy Review – China, 2008" (World Trade Organization, 2008).

ASEAN+3: China, Japan and the Republic of Korea have close economic ties with countries in South-East Asia through the ASEAN+3 framework for cooperation.

ASEAN-China Free Trade Agreement (ACFTA): The Framework Agreement on Comprehensive Economic Cooperation between China and ASEAN was signed on 4 November 2002, and came into force on 1 July 2003. Under the agreement, both parties agreed to negotiate the establishment of ACFTA within 10 years. The comprehensive agreement includes: (a) eliminating tariff and non-tariff barriers for all trade in goods; (b) progressively liberalizing trade in services; (c) establishing an open and competitive investment regime to facilitate and promote investment among partners in ACFTA; and (d) simplifying customs procedures and developing mutual recognition arrangements. To accelerate the establishment of ACFTA, an "early harvest programme" specified that tariffs on all products in HS Chapters 18 and a limited number of products outside those chapters were to be eliminated in the first three years, beginning on 1 January 2004. A longer time frame (i.e., no later than January 2010) was given to Cambodia, the Lao People's Democratic Republic, Myanmar and Viet Nam. ACFTA, comprising the original ASEAN 6 (Brunei Darussalam, Indonesia, Malaysia, the Philippines, Singapore and Thailand) was established in January 2010; however, flexibility up to 2015 was provided for Cambodia, the Lao People's Democratic Republic, Myanmar and Viet Nam.

Asia-Pacific Trade Agreement (APTA): This agreement came into force in 1976 as a preferential trading arrangement between developing countries in the Asia-Pacific region and was known as the Bangkok Agreement. China acceded to the agreement on 12 April 2001 and began implementing concessions on 1 January 2002. APTA is the only agreement that includes both India and China. APTA is essentially a preferential trading arrangement designed to liberalize and expand trade progressively in the Asia-Pacific region through measures such as the relaxation of tariff and non-tariff barriers, and trade-related economic cooperation. The coverage of preferences is at least 50 per cent of the number of tariff lines of each member, while concessions given to member States are at least 50 per cent on average (ESCAP, 2008).

Closer Economic Partnership Agreements – China, Hong Kong and China, Macao: Signed on 29 June 2003 and 17 October 2003, respectively, both agreements resulted in the full elimination of tariffs on imports originating from Hong Kong, China and Macao, China from 1 January 2006. The agreements also include the opening up of markets for services and investments.

China-Chile FTA: On 18 November 2005, Chile became the first country in South America to sign a bilateral FTA with China. The agreement represented an unprecedented event in Asian and Latin American relations, as countries agreed to lift tariffs on 92 per cent of products exported from Chile to China and 50 per cent of the products exported from China to Chile over the course of 10 years.⁶ The reduction in tariffs is expected to increase bilateral trade, and more importantly provide new financial opportunities for Chinese and

⁶ National Customs Service, Chile-China Free Trade Agreement 2006, accessed at www.aduana.cl/prontus_aduana_eng/site/artic/20070227/pags/20070227172530.html#T3.

Chilean business leaders. Under the agreement, approximately half of China's exports to Chile were granted duty-free treatment, while 21 per cent of the remaining duties will be phased out in five years, 26 per cent over the course of 10 years, and 3 per cent completely excluded from the scope of the free trade agreement. At the APEC summit in Peru in November 2008, a China-Peru FTA was officially announced, making it the second Latin American country to conclude an FTA with China.

China-Pakistan FTA: On 5 April 2005, China and Pakistan signed an FTA Early Harvest Agreement under which bilateral tariffs on certain products were eliminated gradually between 1 January 2006 and 1 January 2008.

China-Australia FTA: China and Australia signed a Trade and Economic Framework Agreement on 24 October 2003. The agreement promotes strategic cooperation in: (a) energy and mining; (b) textiles, clothing and footwear; (c) agriculture; (d) mechanical and electronic products; (e) tourism; (f) education; (g) inspection and quarantine; (h) customs cooperation; (i) environmental protection; (j) investment; (k) information and communications technology; (l) biotechnology; (m) public health; (n) food safety; and (o) and intellectual property rights. On 18 April 2005, the two countries agreed to commence negotiations on an FTA, which are currently ongoing.

China-New Zealand FTA: New Zealand signed a similar Trade and Economic Cooperation Framework Agreement on 28 May 2004 with China. Under this framework, both countries agreed to promote cooperation in: (a) agriculture; (b) animal husbandry; (c) forestry; (d) wool; (e) services, including education, tourism, air services, and labour and professional services; (f) science and technology; (g) environmental protection; (h) information and communications technology; and (i) investment. New Zealand and China also signed an FTA in April of 2008 that will eliminate tariffs on all trade during the following 10 years. This was the first full FTA between China and a developed nation, and as such is an historical milestone in the opening up of China's markets to the West. The agreement will eventually eliminate tariffs on all trade, with all tariffs below 5 per cent being immediately dropped (which covers 35 per cent of New Zealand products going to China), while those in the 6-20 per cent range are being phased out over a five-year period (ending in 2012) and tariffs of more than 20 per cent being reduced immediately to 20 per cent and then phased out over six years.⁷ The agreement covers a vast group of products and services, including provisions for the movement of persons and visa issues.

China-Singapore FTA: Negotiations for this FTA started in October 2006 and a deal was struck in late October 2008. The agreement, which came into effect on 1 January 2009, eliminates tariffs on 85 per cent of Singaporean exports to China while a further 10 per cent of exports were to become duty-free by 2010. However, China will continue to impose tariffs on 260 products, such as coffee, pepper, paper products and certain vehicle parts, to protect its home-grown industries. Singapore was to remove all tariffs on Chinese imports from 2009. This FTA is a precursor to similar agreements that will be signed with the ASEAN States in 2012.

⁷ New Zealand Ministry of Foreign Affairs and Trade, 2008, "Key Outcomes: China-New Zealand Free Trade Agreement", accessed at <http://chinafta.govt.nz/1-The-agreement/1-Key-outcomes/index.php>.

China-Pakistan Agreement on Trade in Services: This is the most recent agreement concluded by China. In line with Article 83 of the China-Pakistan FTA on goods between the two countries, negotiation on a trade in services agreement was concluded after five rounds in December 2008. The agreement, which gives Pakistan access to 11 Chinese sectors and gives China access to 160 Pakistani sectors, was set into force in October 2009.

4.2. Automotive sector in China

China's auto industry started in 1953 with the founding of the First Auto Works (FAW). Subsequently, the Shanghai Automotive Industry Corporation (SAIC) and Dongfeng Motors Corporation were established in 1958 and 1967, respectively. Due to reform policies, Chrysler and Volkswagen were allowed to establish joint ventures with the three local players in the 1980s. Peugeot and Citroen were allowed to enter China in the early 1990s. The industry saw the establishment of local independent car makers such as Geely and Chery in the late 1990s as well as significant investments made by late arrivals such as GM, Honda, Nissan and Ford. Not surprisingly, in terms of production and sales of completed automotive vehicles, China is one of the fastest growing markets in Asia as well as the world. The automotive sector in China is well served by the country's position as a low-cost producer and its increasingly wealthy population. These factors have contributed to China's increasing importance as a centre for regional production integration of the industry within Asia; consequently, it is rapidly becoming a hub for components and parts production, completed unit assembly and completed unit sales.

According to WTO (2008), China is the world's third-largest automobile manufacturer after the United States and Japan. In 2006, the automotive sector accounted for 7.3 per cent of total value-added manufacturing and 7.7 per cent of the total manufacturing workforce (2.8 per cent in 2004). In 2006, China had some 100 vehicle manufacturers and around 4,500 auto parts manufacturers. Foreign firms, through joint ventures with local partners, accounted for around 75 per cent of all cars produced in China; 95 per cent of all cars produced in China in 2006 were sold in the domestic market.

In 2010, China reached record levels in both production and sales, with increases of more than 30 per cent, year-on-year. Total production rose to 18.26 million units (an increase of 32 per cent) with passenger cars accounting for 13.9 million units. Trucks and buses made up the remaining 4.37 million units. At the same time, sales of vehicles expanded to 18.06 million units (table 4.1). The growing prevalence of home-produced models has been increasingly evident. In 2007, for instance, 1.24 million Chinese-branded sedans were sold in 2007, accounting for 14 per cent of total units sold. The exceptional growth in car sales and production in the past decade is expected to continue, although efforts by the Government to cool down the economy as well as higher oil prices in 2011 may result in lower growth.

Since 2005, China has been a net exporter of completely built units (CBU) and has exported 16,000 units more than it has imported. However, despite that surplus, in terms of value China recorded a trade deficit of RMB 3.6 billion in vehicle sales, which reflected China's relatively lower position in the value chain, i.e., exports that comprised mainly

Table 4.1. Production and sales of automobiles, historical and projected

	2005	2006	2007	2008	2009	2010	2011*	2012*
Total production (CBU million)	5.71	7.28	8.882	9.35	13.79	18.26	15.533	17.086
• Cars (million)	3.93	5.23	6.38	6.74	10.38	13.90	11.158	12.274
• Commercial vehicles (million)	1.78	2.05	2.5	2.61	3.41	4.37	4.509	4.96
Sales (CBU million)	5.76	7.22	8.796	9.38	13.64	18.06	13.22	14.277

Source: *China Automotive Market Yearbook 2010*.

Notes: * Projected figures; CBU = completely built units.

low-end personal cars and commercial vehicles. For example, the average price of an imported sedan (\$33,892) was four times the average price of the average exported car (\$8,693).⁸ Despite its low position in the value chain, China's CBU exports continued to increase and the trade deficit has narrowed since 2005. In 2007, China's automotive exports surged by 79 per cent to 612,000 units. Passenger car exports more than doubled to 188,600 units in 2007, while exports of buses and off-road vehicles rose 210 per cent to 85,100 units and 220 per cent to 25,700 units, respectively. Chery, Geely and Brilliance were China's leading exporters. Trucks accounted for 40 per cent of total vehicle exports in 2007 while passenger cars captured a 31 per cent share. The remainder included bus and vehicle chassis. Vehicle exports were expected to top the 1 million mark per annum by 2010.⁹ The major export markets are the Middle East, Africa and Asia. The Russian Federation is rapidly becoming an important market as well. Exports to Europe and the United States have lagged behind due to their higher emission standards and quality issues.

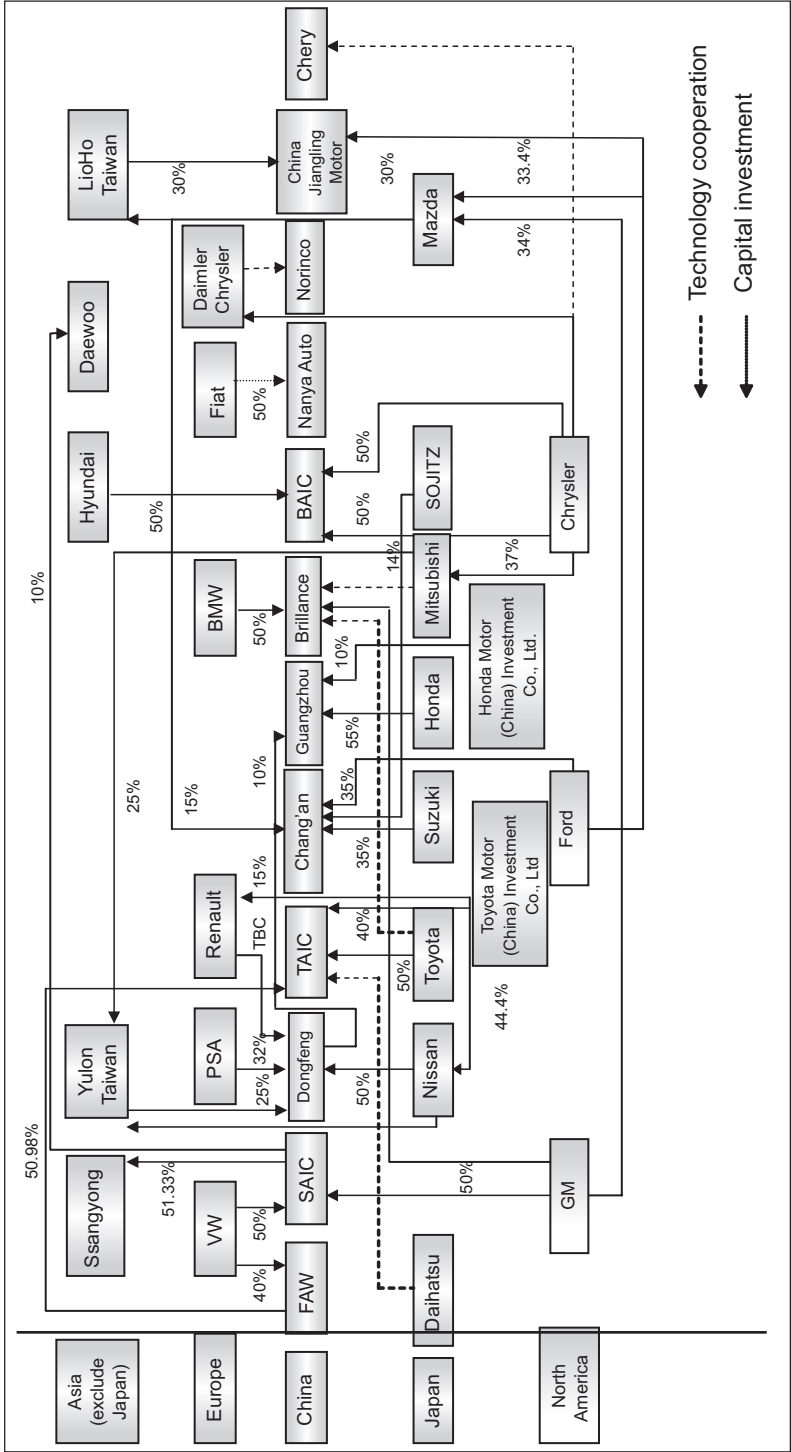
As China is expected to produce more units in the future, industry consolidation is expected to occur gradually. There are about 1,500 registered auto producers, of which fewer than 100 sold more than 10,000 vehicles each in 2006. Many of the small manufacturers sold only 300 to 500 vehicles each. The Government of China has been encouraging consolidation in the fragmented industry in order to create a few national champions that can compete with global giants at home and abroad (Kong, 2008). Since foreign auto manufacturers are still not allowed to establish wholly-owned subsidiaries in China, consolidation will mainly focus on the leading domestic producers – FAW, SAIC, Dongfeng, Changan, BAIC, GAIG, Chery and Geely. However, foreign automakers will play a major role in this consolidation process, as these automakers and their joint ventures have historically maintained a market share of about 80 per cent in the personal car market.¹⁰ Figure 4.1 shows the various joint ventures in the passenger car market while box 4.1 provides further details on China's automotive policy framework.

⁸ Fitch Ratings, "The Chinese auto industry – tuning up for steady growth", 26 April 2006.

⁹ Chinese Association of Automobile Manufacturers.

¹⁰ Fitch Ratings, op. cit.; According to the *Wall Street Journal* (5 February 2009), "the economic crisis engulfing China is also causing many smaller car makers to go out of business, which is a big gain for large local players like Geely and Chery as well as for foreign players, as competition is reduced".

Figure 4.1. Major joint ventures in China's automotive industry



Source: Based on Harper and others, 2007; information on ownership and partnerships updated by the author.

Consistent with the growth in the production, sales and exports of automobiles, the auto parts and components sector in China has also seen impressive improvements. Although car manufacturers previously imported parts and components for assembly in China, an increasing number of these components are now being manufactured in China for both domestic use and exports. This is mainly due to the entry of major auto parts producers into China. Of the world's top 100 auto parts suppliers, 70 per cent already have a presence in China. Some 1,200 foreign-funded or joint-investment parts manufacturers in China now hold 50 per cent of the market.¹¹ Among them are brands such as Delphi, Bosch, Visteon and Continental. Local parts manufacturers such as Wanxiang (China's largest maker of auto parts), Shaanxi Fast, Fuyao Glass, Xinyi Glass and Nanjing Aotekar have made impressive entry into the industry, taking advantage of the 1,000 auto parts-based industrial parks across the country.¹²

China's exports of auto parts reached RMB 14.5 billion in 2007 as major manufacturers had become more confident of their quality. Sales revenue of China's auto parts producers reached RMB 403.5 billion in 2006. The output value of China's auto parts was projected to reach RMB 800 billion in 2010.¹³

Box 4.1. Main features of China's automobile policy

Foreign investment in the automotive industry requires prior approval from the central Government. Foreign firms need to have their own product patents and trade marks, product development and manufacturing technology, independent international sales channels and financing capabilities.

For CBU vehicles and engines, the Chinese partner must own at least 50 per cent of the equity share. The limit can be relaxed if the intention is exporting and if the company is located in an export processing zone. A foreign enterprise must set up its own research and development (R&D) department in China and manufacture products that meet international technical standards.

Each foreign automaker is allowed to have two joint ventures per vehicle category; additional joint ventures are allowed if it involves investing with the local partner to acquire other domestic automakers.

The minimum capital requirement for new entrants is RMB 2 billion, of which self-owned capital must be no less than RMB 800 million, while an R&D institution must be established with an investment of no less than RMB 500 million. The total investment for auto-engine manufacturers should be no less than RMB 1.5 billion, of which self-owned capital should be no less than RMB 500 million. New assembly plants must have an annual capacity to produce at least 10,000 trucks, 50,000 autos with four-cylinder engines or 30,000 autos with six-cylinder engines.

¹¹ "China's emerging car industry", *Business Week*, 12 April 2007.

¹² "China auto parts industry report, 2007-2008", Reuters, 10 March 2008.

¹³ Ibid.

Automobile manufacturers exceeding certain levels of production, sales and R&D expenditure are granted preferential treatment by the central Government, such as reduced tax rates when making fixed asset investments, favourable conditions for bank loans, priority approval when listing on stock exchanges, and easier access to capital from abroad and government loans.

Imports of motor vehicles can only be done through the coastal ports of Dalian, Tianjin, Shanghai and Huangpu as well as the terrestrial ports of Manchuria, Shenzhen and Xinjiang Alashankou. Imports of used vehicles are prohibited.

Tariffs on imported parts are linked to the final value of vehicles. If imports of key pieces reach or surpass a stipulated volume, they are considered as assembled parts and may be subject to tariff rates applied to CBU units. The simple average applied rate (including interim duty) for motor vehicles (ISIC 3843) was 13.5 per cent in 2006. The tariff for vehicle components is 10 per cent.

Expenditures for R&D are tax deductible provided they comply with technological policy.

Measures are in place for preventing local protectionism; local governments should not implement discriminative policies on automobiles not produced locally nor adopt measures that could result in discriminative consequences.

Source: World Trade Organization, 2006 and 2008.

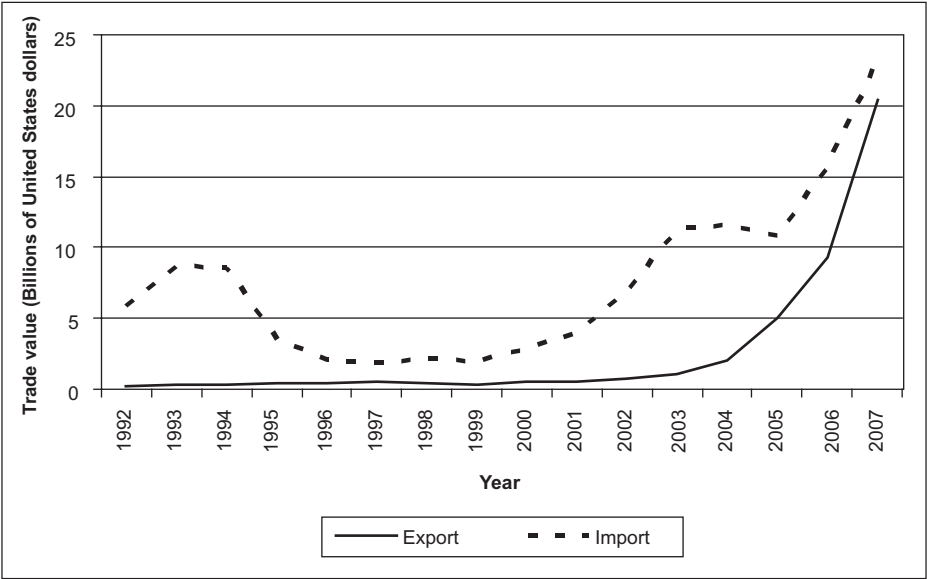
4.3. China's auto industry and international trade

In value terms, China is a net importer of final goods in the automobile sector. In defining final goods as SITC 781 (passenger motor vehicles, excluding buses), SITC 782 (goods and specialized transport vehicles) and SITC 783 (road motor vehicles not elsewhere stated), figure 4.2 shows that the large gap between imports and exports was decreasing in 2007. Exports of final goods have experienced exponential growth since 2003. This may reflect the emergence of China's own auto producers such as Geely, Chery and Brilliance. Among the product categories, SITC 781 makes up about 60 per cent of total final goods. Figure 4.3 shows that SITC 781 is the dominant reason for China's trade deficit in the auto industry. SITC 782 and SITC 783 (buses etc.) show a trade surplus for China in recent years.

China's imports of final goods come from traditional auto producers such as Germany, Japan and the United States (which together made up nearly three-quarters of China's total vehicle imports in 2007). China's exports are more varied in location. The Russian Federation, as explained above, was the single largest destination. Other lesser-known developing country export markets are important destinations for China's auto makers. These include the Islamic Republic of Iran, Kazakhstan and Algeria.

International trade in parts and components contributed to more than two-thirds (67 per cent) of China's trade in the auto industry. China was, in the past, a net importer of

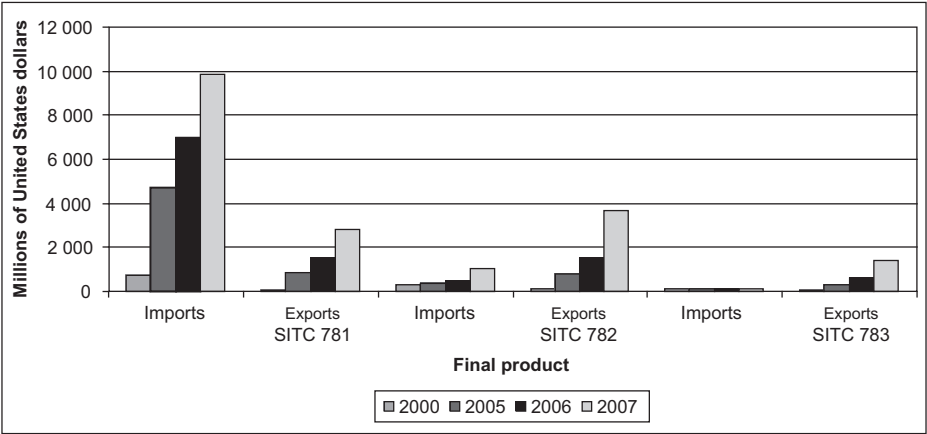
**Figure 4.2. Imports and exports of final goods (SITC 781 , 782 and 783)
in China's auto industry, 1992-2007**



Source: United Nations Comtrade, downloaded from <http://comtrade.un.org/db/default.aspx>.

Note: SITC 781 refers to passenger motor vehicles, excluding buses; SITC 782 refers to goods and specialized transport vehicles; and SITC 783 refers to road motor vehicles not stated elsewhere.

Figure 4.3. China's trade in final goods by product category



Source: United Nations Comtrade, downloaded from <http://comtrade.un.org/db/default.aspx>.

Note: SITC 781 refers to passenger motor vehicles, excluding buses; SITC 782 refers to goods and specialized transport vehicles; and SITC 783 refers to road motor vehicles not stated elsewhere.

Table 4.2. Import sources and export destinations of final goods, 2007

Imports		Exports	
Partner	Per cent	Partner	Per cent
Germany	33.25	Russian Federation	18.67
Japan	27.49	Islamic Republic of Iran	6.49
United States	13.18	Kazakhstan	5.99
Republic of Korea	6.97	Algeria	4.65
Slovakia	5.21	Viet Nam	4.45
United Kingdom	4.71	South Africa	4.30
Sweden	3.17	Ukraine	4.16
Austria	1.57	United States	3.94
Mexico	0.71	United Kingdom	2.96
France	0.67	Syria	2.86
Top 10 cumulative	96.93	Top 10 cumulative	58.47

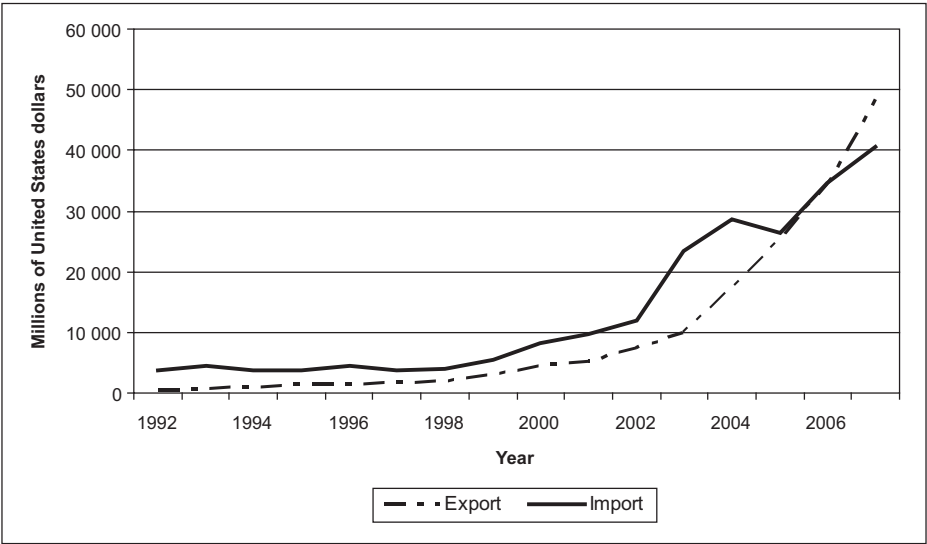
Source: United Nations Comtrade, downloaded from <http://comtrade.un.org/db/default.aspx>.

auto parts and components.¹⁴ As shown in figure 4.4, China only became a net exporter of parts and components in 2007. The growth in trade for parts became exponential in 2002, which coincided with the growth of China's auto industry, as explained above. Improvements made by local manufacturers in terms of design and quality also contributed towards making China a net exporter. United Nations Comtrade macro trade data does not provide much explanation as to the exact parts traded (figure 4.5). In 2000, 45 per cent of parts traded fell under SITC 78439 (other parts and accessories). Although the figure declined to about 33 per cent in 2007, it was still the largest category. However, other important product categories that were featured significantly in 2007 included: SITC 78434 (gearboxes), SITC 78433 (brakes), SITC 78432 (parts and accessories of bodies), SITC 7783 (electrical equipment), SITC 77313 (ignition wiring sets), SITC 71651 (electrical generating sets), SITC 71391 (other parts for internal combustion engines) and SITC 7132 (internal combustion engines).

The important role played by international production networks in China's parts and components industry is also obvious when intra-industry trade (IIT) is considered. Two-way exchanges of related products between nations can emerge due to differences in factor endowments (Helpman and Krugman, 1985), and consumer tastes and preferences (Krugman, 1980). The extent of China's IIT in automotive parts and components (at the

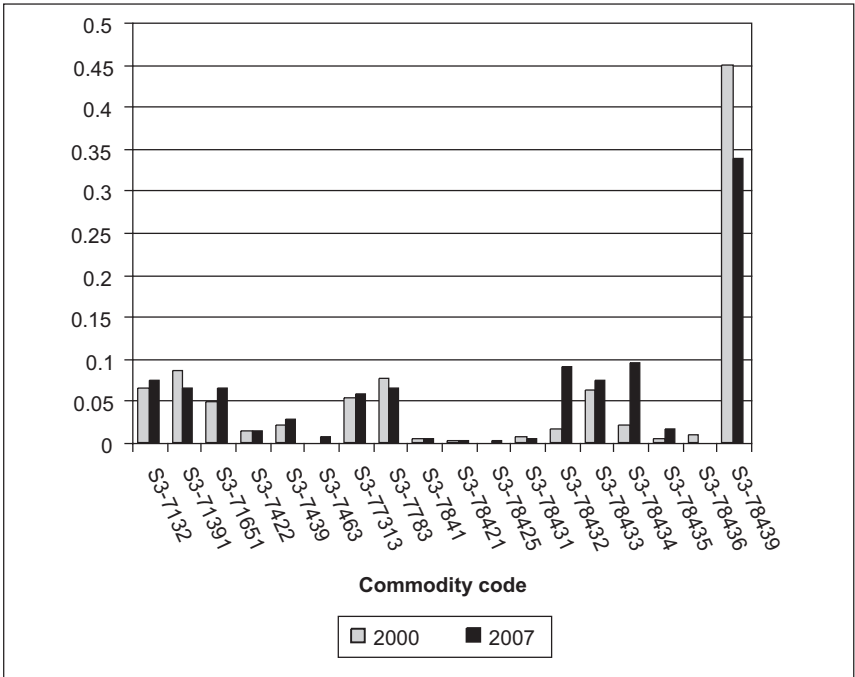
¹⁴ For the purpose of this study, parts and components in the auto industry have been defined as SITC 7132, 71391, 71651, 7422, 7439, 7463, 77313, 7783 and 784. These classifications are under SITC Rev. 3. These items were selected after an analysis of the items listed by Athukorala (2007) and Kaminski and Ng (2001) as well as the author's review of the SITC list.

Figure 4.4. China's exports and imports of parts and components, 1992-2007



Source: United Nations Comtrade, downloaded from <http://comtrade.un.org/db/default.aspx>.

Figure 4.5. China's trade in parts and components: Important product categories (per cent)



Source: United Nations Comtrade, downloaded from <http://comtrade.un.org/db/default.aspx>.

5-digit level SITC) is shown in figure 4.6;¹⁵ IIT tripled from about 23 per cent in 1992 to 60 per cent in 2007. The increase in IIT occurred in nearly all product categories (figure 4.7). Zhu (2008) differentiated between horizontal and vertical IIT and found that the latter dominated this industry. This indicates that China's lower production costs have acted as the prime driver of IIT. However, horizontal IIT is increasing, indicating that sophistication in output is increasing, and demand for high-quality components is showing an upward trend.

The source of imports and destinations of exports for 2007 are shown in table 4.3. There are no surprises as the main auto producing countries such as Japan, Germany, the Republic of Korea and the United States were the sources of imports while the United States, Japan, the Republic of Korea and Canada were important destinations.

Considering the sources of imports and destinations of exports for final goods as well as parts and components in China's automotive-related trade, it can be concluded that RTAs do not play a significant role. Apart from Hong Kong, China, important trading partners in the auto sector are not those with which China has an RTA. For example, countries within ACFTA (China's oldest and most advanced trade agreement) do not feature well in the auto trade (table 4.4). Only exports of final goods to Viet Nam stand out as being significant. However, it must be noted that automotive final goods, part and components as defined in this chapter accounted for only 6 per cent of total China trade in 2007. Trade with RTA partners may be more significant in other sectors.

Perhaps of greater significance than RTAs was accession by China to WTO in 2001. Under its current WTO obligations related to trade in completed vehicle units and parts China made the following reductions:

- (a) As of 1 July 2006, China's Customs Tariff Commission of the State Council reduced tariffs on cars, SUVs and minibuses from 28 per cent to 25 per cent;
- (b) Taxes on selected parts were reduced from 13.8 per cent to 10 per cent;
- (c) Tariffs on parts such as transmissions, clutches, and radiators became 10 per cent.

¹⁵ The most widely used method for calculating IIT was developed by Grubel and Lloyd (1971). Different modifications of the Grubel-Lloyd measure are often employed in IIT literature, i.e., the unweighted IIT method and the weighted IIT method. The preferred measure of IIT and the measure adopted in the study detailed in this chapter is the adjusted Grubel and Lloyd (1975) index using the relative size of exports and imports of a particular good within an industry as weightings:

$$IIT = \frac{\sum_{i=1}^n (X_i + M_i) - \sum_{i=1}^n |X_i - M_i|}{\sum_{i=1}^n (X_i + M_i)} \times 100$$

where X_i and M_i are China's exports and imports of product i , respectively. The value of this index is zero if all trade is inter-industry trade; it is equal to 100 if it is completely IIT.

Figure 4.6. China's intra-industry trade in automotive parts and components, 1992-2007

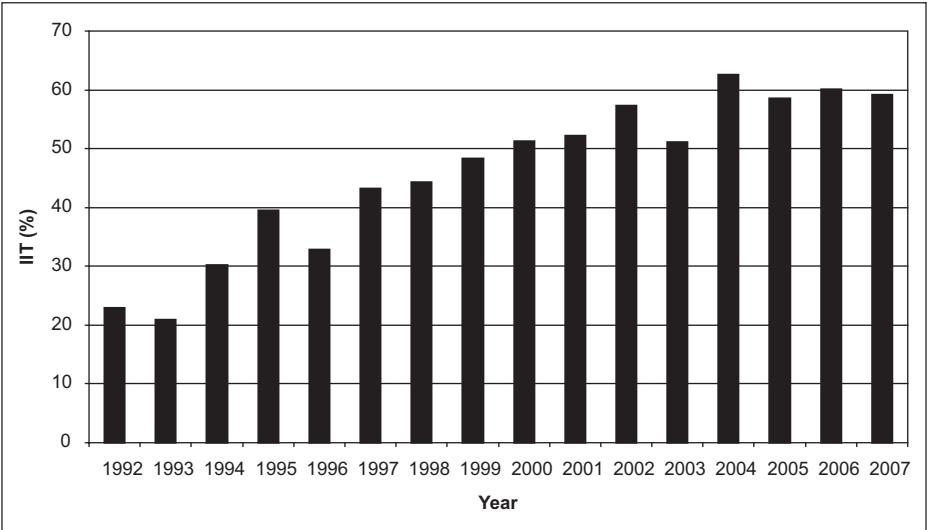


Figure 4.7. China's intra-industry trade in selected parts and components

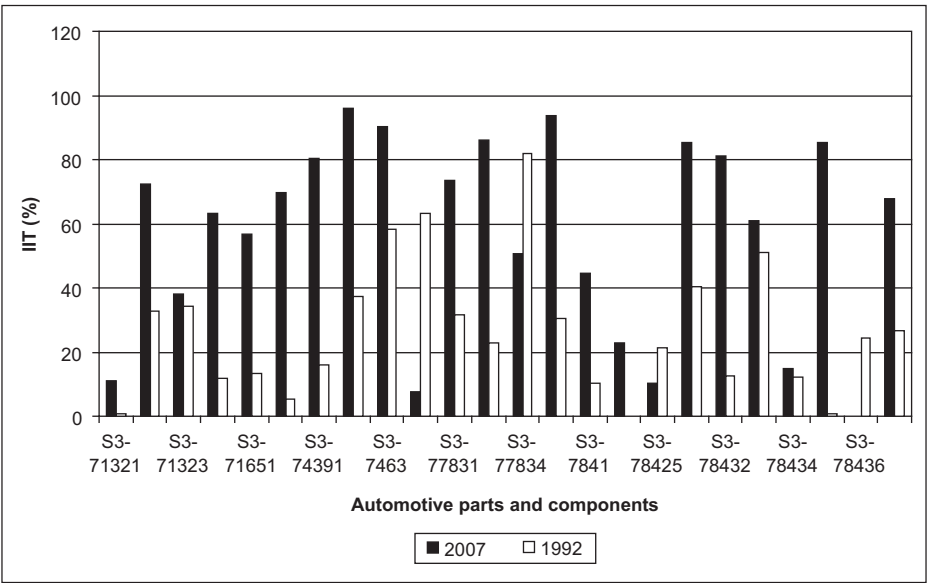


Table 4.3. Import sources and export destination of auto parts and components, 2007

Imports		Exports	
Partner	Per cent	Partner	Per cent
Japan	16.28	United States	14.69
Germany	9.87	Japan	8.48
Republic of Korea	5.10	Republic of Korea	3.78
United States	3.40	Canada	1.92
France	1.66	Germany	1.61
Hungary	1.45	United Arab Emirates	1.38
United Kingdom	0.79	Italy	1.30
Spain	0.69	Islamic Republic of Iran	1.14
Canada	0.61	United Kingdom	1.03
Other Asia, n.e.s.	0.58	Hong Kong, China	0.97
Top 10 cumulative	40.43	Top 10 cumulative	36.3

Source: United Nations Comtrade, downloaded from <http://comtrade.un.org/db/default.aspx>.

Table 4.4. China's trade with selected RTA partners, 2007

Country/area	All goods (% of total trade)		Trade in automotive parts and components (% of total trade)		Trade in automotive final goods (% of total trade)	
	Imports	Exports	Imports	Exports	Imports	Exports
Malaysia	3.0	1.5	0.1	0.5	0.0	0.2
Thailand	2.4	1.0	0.2	0.5	0.0	0.3
Philippines	2.4	0.6	0.0	0.2	0.0	0.4
Indonesia	1.3	1.0	0.2	0.6	0.0	0.1
Viet Nam	0.3	1.0	0.0	0.5	0.0	4.5
Singapore	1.8	2.4	0.2	0.3	0.0	0.4
New Zealand	0.2	0.2	0.0	0.0	0.0	0.1
Pakistan	0.1	0.5	0.0	0.3	0.0	0.3
Chile	1.1	0.4	0.0	0.1	0.0	0.8
Hong Kong, China	1.3	15.1	0.0	0.7	0.0	0.4
Macau, China	0.0	0.2	0.0	0.0	0.0	0.1
Australia	2.7	1.5	0.4	0.6	0.0	0.6
Total	16.6	25.4	1.1	4.3	0.0	8.2

Source: United Nations Comtrade, downloaded from <http://comtrade.un.org/db/default.aspx>.

The reduction in tariffs for final goods as well as parts and components could further explain the dramatic rise in China's trade. However, the emergence of China as an important automotive player in the global market has not been without obstacles. China recently lost its first trade dispute with WTO when it was challenged by the United States, Canada and the European Union over non-competitive trading practices. Since 2006, China charged the same import tariff of 25 per cent for a completed unit as it charged for a kit of imported parts. The United States, Canada and the European Union argued that the imported parts did not constitute a complete kit for a whole unit, and should therefore be liable for an import tariff of only 10 per cent. This policy was designed to protect domestic manufacturers and encourage foreign vehicle manufacturers to purchase from domestic suppliers. These policies were recently ruled as discriminatory and China now fully complies with WTO regulations.

4.4. IPNs and RTAs: Firm-level issues

The research detailed here on the issue of IPNs and RTAs at the micro level was based on in-depth interviews with seven China-based firms in the automotive sector. Those firms included Chinese car manufacturers, world-renowned parts manufacturers, a spare parts dealer for a well-known Swedish car manufacturer and a medium-sized exporter of auto parts. Details of the interviewees are given in box 4.2.

The interviews were based on open-ended questions, allowing respondents to provide detail explanations and examples of issues surrounding the trade in automotive parts and final goods. The key issues that resulted from the interviews are detailed below.

Box 4.2. Brief overview of interview respondents

Company A is a Swedish firm incorporated in the United States. It develops markets and manufactures airbags, seatbelts, safety electronics, steering wheels, anti-whiplash systems, seat components and child seats as well as night vision systems and other active safety systems. It serves all leading automobile manufacturers worldwide through 80 facilities in more than 30 countries that employ nearly 42,000 people globally. Operating in China for more than 20 years, the company manufactures safety systems by buying and assembling the components in its factories in Changchun, Nanjing, Shanghai and Guangzhou. The components are sourced from Europe and the United States as well as from domestic producers. Very little is sourced from other Asian countries due to the high quality required for the safety systems. Nearly 70 per cent of the output is for the local market (covering nearly all major car manufacturers in China) while the rest is exported mainly to Australia, the Republic of Korea and Japan.

Company B is a foreign-owned company and a subsidiary of a well-known Swedish brand. It sells spare parts, 99 per cent of which are imported from Belgium and France, sometimes via Singapore, to dealers in China. A small proportion is imported from an assembly plant located in the Republic of Korea. There is only limited local sourcing because the quality of local parts is unstable. Nevertheless, the local quality has improved

recently. Local production through external suppliers could start in five years for domestic consumption as well as for exports to Europe and Australia.

Company C is a leading global supplier of mobile electronics and transportation systems, including powertrains, safety, steering, thermal, and control and security systems, electrical/electronic architecture and in-car entertainment technologies. Its technology is also found in computing, communications, consumer electronics, energy and medical applications. The company, which is headquartered in the United States, has approximately 155,500 employees and operates 148 wholly-owned manufacturing sites in 35 countries with sales of \$22.3 billion in 2007. Since 1993, the company has had a presence in China, where it has established a solid footprint with a world-class research and development centre, mature manufacturing facilities and customer service centres in many cities including Beijing, Shanghai, Guangzhou, Suzhou, Wuxi, Yantai, Changchun and Baicheng. Recently, the company expanded into the aftermarket in China, launching its high-quality original equipment products and services for Chinese drivers. It specializes in wiring, harnesses and electric circuits, using raw materials from China (50 per cent) and abroad (50 per cent), and sells the final output to major car manufacturers (both joint ventures and local players) in China (85 per cent) and abroad (15 per cent).

Company D is China's largest exporter of passenger cars. In 2007, it exported almost 120,000 cars to nearly 70 countries, and has seven assembly plants in Asia, Africa, Europe and South America. It has the technology for building core components and was the first Chinese automaker to manufacture cars and to develop products for foreign original equipment manufacturers. The company's main business is the production of CBUs, engine gearboxes and spare parts. However, 90 per cent of its revenue comes from CBU sales. The company produces the critical components itself, while non-critical component production is outsourced, mainly to other suppliers in China. The main market for its cars is China while its important export markets are the Russian Federation and Ukraine.

Company E is headquartered in Germany, and has nearly 200 production and R&D sites in 36 countries. It is a leading automotive supplier worldwide, producing a range of automotive components including brake systems, components and systems for powertrains and chassis, instrumentation, infotainment solutions, vehicle electronics, tyres and technical elastomers. It is the world leader in a number of automotive components including hydraulic braking systems, airbag electronics and instrumentation. In 2007, it employed more than 150,000 people worldwide and recorded sales worth €16.6 billion. It began its automotive operations in China in 1994 and opened its Asia headquarters in Shanghai in January 2006. Today it has nine automotive plants and one test centre in China. The company employs a specialist, based in Shanghai, to track RTAs in the Asian region. Although it prefers local suppliers, high quality standards have to be met. The company puts much effort into developing local suppliers, particularly in China. Local suppliers are preferred because it shortens the supply chain, improves the reaction time during frequent demand fluctuations and possibly reduces the landed costs.

Company F is a Chinese company with a well-known foreign joint venture partner. It produces light-duty vehicles including pick-up trucks and vans. The company dominates China's high-end light bus market and is a leading player in the market for diesel-engine

commercial vehicles and high-end light buses. Its local brand names dominate the mid- and high-end markets. It produces the main components such as engines, body frames and parts, and outsources other components to China-based suppliers. Its main market is China (90 per cent) but it also exports to North Africa and the Middle East. The company uses local suppliers because they offer competitive prices while ensuring shorter lead time and convenient communications.

Company G was established in 2003 as an international manufacturing, exporting, trading and industrial support company in Shanghai. It is part of a Tehran-based group with 70 overseas locations. It deals with a range of auto products including electromotors and bearings for its affiliated factories, companies and customers in the United States, Europe, Africa and the Middle East. In China, it sources parts for export and, more recently, it established an assembly plant for some motor parts.

4.4.1. Awareness and importance of RTAs

From the fact that the respondent companies were of different sizes, a clear indication was perceived that RTAs appeared to matter more to larger players than smaller ones. Those respondents who were world players in the production and assembly of parts, for example, had dedicated personnel for tracking the development of RTAs in the region, since such agreements are an important criterion when making decisions on the location of future plants or supplier sources. In particular, when these companies are Asia-based, RTAs appear to be more important. Chinese car manufacturers who were interviewed claimed some knowledge of RTAs but added that the agreements usually ignored the automotive industry. Unsurprisingly, China's RTA partners did not appear to be important sources and destinations of their products. Smaller-sized players such as exporters and spare-parts dealers had limited knowledge of RTAs, claiming that import duties were passed on to consumers in any case.

The degree of importance of RTAs in business decision-making is dependent on three factors:

- (a) The depth of tariff reduction;
- (b) Volume of business;
- (c) The amount of documentation required for tariff reduction eligibility.

Smaller firms require a substantial reduction in tariffs if the effort put into the documentation process is to be worthwhile. On the other hand, firms that deal with large volumes of parts and components claim that even a 3 per cent reduction in tariffs may save a plant a substantial amount in costs. Thus, while the current import duty on parts and components in China is 10 per cent, a reduction to 5 per cent as a result of an RTA may be considered important by a large player that imports several million United States dollars worth of parts for assembly in China.

4.4.2. Selection of suppliers and markets

When sourcing for parts and components, product quality appeared to matter most. As many of the respondents were dealing with safety-related products (e.g., braking systems, airbags etc.), the ability of suppliers to meet quality standards set by car manufacturers was considered essential. Landed price (which includes import duties) is also important, but without a compromise on quality. The long-term relationship with the supplier was also taken into consideration by all the respondents. For the foreign producers, the ability of parts suppliers to meet the quality standards of one manufacturer provided some assurance that the standards imposed by other manufacturers could also be met. Although tariffs and non-tariff barriers were considered important by all the respondents, quality and supplier relationships were considered critical factors in the selection process. Thus, there appeared to be a preference for Chinese suppliers or foreign suppliers with a presence in China. As mentioned above, tariffs and RTAs become important if they reduce the landed price substantially.

A related issue in the selection process is the localization of the production of parts and components. Among the local respondents, there was a clear preference for dealing with local suppliers because of the ease of communication as well as the convenience of managing quality and logistics issues, which ensured a reduction in lead time. The fact that many foreign producers of parts and components, such as Bosch, Delphi and Continental, have established production and assembly bases in China means that most parts can be sourced from within China.¹⁶ In the early 1990s, automotive components were shipped in kits to China, assembled and then exported back to the producer country. That explained the small gap between exports and imports in the 1990s (figure 4.2).

In recent years, the technological capabilities of Chinese producers have increased while the production capacity of local producers has been enhanced by the increasing size of the local automotive industry as well as the forging of greater alliances between foreign suppliers and local producers. As a result, China has become an important exporter of parts and components. The growth of the auto parts industry in China is illustrated by the figures available at Gasgoo.com (China's largest auto parts business portal). It classifies the auto parts industry into three segments – the domestic original equipment market, the export market and the aftermarket (spare parts) (table 4.5). With a total market output of RMB740 billion (about \$105 billion), the sector is expected to become a significant component of China's manufacturing industry. Despite being a latecomer in the auto parts and components industry, the economy-of-scales advantage experienced by Chinese producers has reduced the average service link cost (Kimura and Obashi, 2008), thus providing those producers with a competitive edge over their counterparts elsewhere.

¹⁶ The example of the Shanghai Automobile Industry Corporation (SAIC) provides clear evidence. For its Roewe 550 (formerly Rover) model, purchasing parts and components within China is feasible because its key supplier, TRW Automotive Holdings Corp., an American-based global safety system supplier, produces domestically in China, while driver and passenger airbags are manufactured by SAIC's joint ventures in Shanghai and Changchun.

Table 4.5. Growth in the Chinese auto parts market

Segment	2002	2007
Domestic original equipment	RMB 190 billion	RMB 500 billion
Exports	RMB 15 billion	RMB 120 billion
Aftermarket	RMB 70 billion	RMB 120 billion

Source: www.gasgoo.com.

Herein lies the conflict between protecting the domestic industry and the expansion of trade through an RTA. Tariff protection (as practiced by China and Thailand) results in the emergence of a domestic parts and components industry, as car manufacturers are forced to transfer the technology and production capacities within the country. Once volume is built up and economy-of-scale effects are realized, the country has a competitive advantage and becomes an exporter. In the case of China, the size of the potential market provided an added incentive for developing a thriving local industry. Thus, an RTA will benefit a country only when the capabilities and capacities within an industry have reached a competitive level. Since automotive goods are still not included in the RTAs to which China is a party, it can be assumed that the Chinese authorities are not convinced the nation is ready for tariff-free competition.

4.4.3. Non-tariff barriers to IPNs

The challenges faced by firms involved in international trade are well known. However, the same challenges are amplified for firms within an IPN. Participants in the supply chain need to adhere to strict delivery (or lead) times, as failing to do so may cause the entire chain to collapse due to accumulated delays. In addition, as parts and components may originate from different locations across a region (or worldwide in the case of China's automotive sector), the documentation involved in customs procedures can be substantial. The respondents highlighted three main barriers that inhibit efficient flow of products in their IPNs.

The first barrier is the codification of parts and components, which varies from country to country. This barrier is particularly challenging for assemblers who source parts from different countries. Despite efforts by various RTAs to harmonize the customs code,¹⁷ at the practical level the national Customs Department decides on the code of a part or component. The problem is further exacerbated when the code is changed from time to time, either due to revision of the codification system or changes in customs officers. This creates uncertainties for firms, which affects their strategic planning. For example, an ABS braking system that is coded as HS 9032 (electrical system) by Japan and Malaysia, is classified as HS 8708 (hydraulic brakes) by Thailand. The import duties vary greatly between these codes. Furthermore, HS 8708 is usually classified under the sensitive list and would not be considered for tariff reduction in an RTA. Thus, differences in the

¹⁷ See, for example, www.aseansec.org/10113.htm for the case of ASEAN.

codification system act as a deterrent to wider IPNs. Related to this issue is the calculation of local content, which also varies from country to country. The respondents referred to the standardized European Union Community Customs Code which allows importers to use the certificate received from one European Union partner throughout the Union. However, it should be noted that it took the European Union 25 years to formulate and realize a common code (Wulf, 2005).

Second, if RTAs are to make a significant impact on IPNs, documentation requirements for tariff reduction eligibility must be reduced to a minimum. As one respondent noted, "RTAs are a cost to us". For an assembler who sources parts from various countries who are partners in different RTAs, the documentation required can be cumbersome and may not be worth the effort, particularly if the tariff reduction is small. In this regard, the respondents said they preferred a multilateral agreement or an RTA with more members, if standard documentation processes apply.

Third, IPNs would flourish if customs clearance procedures were streamlined and made less cumbersome. Smaller importers/suppliers that cannot benefit from lower tariffs (because the margin between the WTO-imposed duties and RTA-agreed margin of preference is small) or from low volumes are unable to gain from an RTA. The agreements can only be useful if products that move between member countries can be cleared from ports at a faster rate. To these firms, an RTA should result in less documentation for clearance or a reduction in the sample of shipment that goes under customs scrutiny. As mentioned already, if RTAs are designed to bolster trade between member countries, trade facilitation has to be an important feature of the agreements, particularly among firms within a value chain.

4.5. Discussion

The current study of the automotive sector vis-à-vis RTAs and IPNs highlights several issues.

First, China's accession to WTO changed that country's automotive industry significantly. The largest jump in imports of final goods as well as parts and components occurred after 2001, most likely due to a reduction in tariffs. At the same time, China also received MFN status from its trading partners, which boosted its exports, and made it a net exporter of parts and components in 2007.

Second, RTAs appear to matter little in China's automotive sector. RTA partners do not feature strongly in auto trading. This may be due to the exclusion of vehicles, parts and components in RTA deals. However, as the proliferation of RTAs continues, and the depth of agreements increases, RTAs may prove to be significant in the future. It is important to note that rather than trying to protect its own automotive sector, China may insist that its trading partners open up their markets to Chinese-made products. The Chinese producers who were interviewed were already lamenting over the barriers imposed by the Russian Federation and others on Chinese – made autos. Unsurprisingly, the strategies employed by those firms are similar to those employed by their counterparts when they entered China

in the 1990s, i.e., export the parts and components in kits and assemble them in target markets to avoid high import duties.

Third, China's success as an auto parts and component producer can be attributed to the following factors:

- (a) Low-cost labour, at least at the initial stage;
- (b) Incentives provided by the Government in the form of land, import and export duty rebates, conditional access to the domestic market etc.;
- (c) The size of the Chinese market that provided economy-of-scale advantages that were then used to gain a competitive edge in other markets;
- (d) Protection of the domestic auto industry against outright competition, allowing the growth of local firms' capabilities and capacities.

The Chinese auto industry is an excellent example of how initial protection of the industry through tariffs and non-tariff barriers, careful provision of incentives and liberal domestic policies can change a near non-existent industry into one that meets world standards. This implies that trade barriers may act as a potent tool for developing competitive advantage. However, there are three conditions: a significant domestic market should already exist; the industry should have some initial competitive advantage (e.g., low labour costs); and a period of protection. If these conditions do not exist, trade barriers can only result in inefficient allocation of resources.

Fourth, for RTAs to have a positive effect on IPNs, an industry-specific agreement may be useful. In particular, for the automotive industry, the number of parts and components involved is so extensive that documentation procedures become tedious when some parts qualify for tariff reduction while others do not. In this context, a multi-lateral tariff reduction, or an RTA that involves more countries would be helpful if the agreement has standard clauses for all parties involved. The current practice of customs codification, which varies from one partner to another, does not contribute to the benefit of free trade. In this regard, an industry-specific agreement for the automotive sector should take into consideration the peculiarities of the industry and include those products that can expand trade within the sector. Industry-specific agreements need intense involvement of businesses rather than leaving the negotiations to bureaucrats who have a limited knowledge of industry issues.

Finally, businesses are of the opinion that governments should be clear as to the objectives of RTAs. If the objective is to promote greater peace and security in the region, i.e., for international relations purposes, then RTAs can be considered successful. However, if the RTAs have a trade agenda, then policymakers need to consider not just tariff reductions, but also operational issues such as standardized documentation, the harmonization of codes and transparency in customs clearance procedures. While leaders shake hands and sign agreements, the actual effect on trade can be minimal as businesses need to overcome myriad exclusions and administrative hurdles to gain even a minor reduction in costs.

4.6. Conclusion

In the same week that leading United States auto makers were pleading for a \$25 billion bailout to save the industry from near collapse, the sixth Guangzhou International Auto Show showcased new models that the same United States companies were planning to roll out through their joint ventures in China.¹⁸ For the whole of 2008, unit sales grew at 7 per cent, compared with 20 per cent annual growth that was seen throughout the decade. In 2009, no growth or even a modest contraction was expected, but in January 2009, China became the largest car market in the world, surpassing the United States.¹⁹ The growth of China's automotive industry during the past two decades was not only due to a growing wealthier population, but also policies that were carefully designed by Beijing.

From a closed domestic market to wholly-owned foreign car manufacturers – initially state-owned, then opening up by allowing privately-owned manufacturers, relatively high tariff barriers that were reduced due to WTO accession, and the marketing of Chinese cars to markets ignored by industry leaders – has resulted in an auto industry that will soon be the second largest in the world. Although RTAs have not contributed significantly to the development of IPNs within the automotive industry in China, its future significance cannot be ignored as Chinese-made parts, components and vehicles make their way into the global market.

¹⁸ *China Daily*, 20 November 2008.

¹⁹ *Wall Street Journal*, 5 February 2009.