

China's Automotive Industry



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Executive Summary

This study presents an analysis of China's automotive industry. China began its economic reforms and adopted its open door policy in 1979. The domestic automotive industry was very weak before the reforms. In the 1980s, there was a rapid expansion of the industry. The number of automobile producers soared. However, the market was heavily protected from international competition, including imports and foreign direct investment. In the 1990s, the industry was dominated by a few large Sino-Foreign joint ventures. However, the automobile market is now fragmented. Entering into the 21st century, China has opened its doors wider and wider to foreign competition. While the domestic automakers and joint ventures have had 10 to 20 years to develop themselves, there will still be big shocks to the industry and market once all trade and investment barriers have been removed. China will maintain robust economic growth for a long period of time and the automobile industry will benefit a great deal from this. It is important for a company in this industry to understand fully the history of this industry, to anticipate the possible changes in the future, and to formulate good strategies for the company's development.

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1. Introduction

China began its economic reforms and adopted its open door policy in 1979. Even since then, China's economy has grown at about 10% per year on average. Chinese people have enjoyed great improvement in their standards of living. As a result, demand for private cars has increased dramatically. China's lucrative domestic car market attracts domestic car manufactures as well as giant foreign car companies. All of them want to enter this market and acquire a market share.

Although China had a domestic car industry before 1979, the domestic car producers were very inefficient and produced low-quality cars. Facing market reforms and import competition, the industry has gone through significant changes since the reforms began. China's entry to the WTO has brought more and more competition to this industry. What is the current situation of the automobile industry in China? How will industry competition, the market structure and firms' competitiveness change? In this report, we use Michael Porter's Five-Force Model to analyze China's automobile industry to answer these questions. With a full understanding of China's automobile industry, we are able to suggest several strategies for a domestic car producer to compete successfully in this industry.

The report is divided into five parts. In Section 2, we give a brief history of China's automobile industry from 1949 to the present. In Section 3, we analyze various key structural features of this industry. In Section 4, we examine the industry from a global perspective. Finally, in Section 5, we discuss some possible strategies for domestic car producers.

2. A Brief History

This section outlines the development of China's motor vehicle industry since 1949. It serves to provide background information for the current industry analysis conducted later in this report.

2.1. 1949 – 1979: Pre-reform Period

A domestic automotive industry did not exist in China before 1949 and hence virtually all of the cars in China were imported from overseas. After 1949, China's new government received help from the USSR and wanted to develop its own large-scale industries. The automotive industry was on the list. In 1956, the First Automotive Works (FAW) was founded, which produced trucks called Jiefang (*Liberalization*). Two years later, FAW produced its first passenger cars named Hongqi (*Red Flag*), which were designed for and used by high-ranking government officials. Over time, other automotive companies were also established. For example, the Shanghai Automobile Assembly Plant produced the Phoenix model passenger car (1958). The Second Automotive Works (later renamed Dongfeng) produced the Dongfeng model (1969).

Although the domestic vehicle plants had technologies to produce cars, they mainly produced trucks and buses for transportation, tractors for agriculture, and jeeps for the military. As private cars were regarded as luxury goods, they were not produced or imported for the general public.

2.2. 1980 – Present: Reform Period

China’s economic reforms since 1979 brought changes to the whole economy. The automotive industry has developed rapidly. The production of motor vehicles changed gradually from following a centralized plan to having a market orientation. There have been a number of significant changes. First, the central government relaxed its market entry rules. As a result, all provinces established their own automobile plants. As shown in Table 2.1, the market became less concentrated. By the end of 2002, China had 2436 automotive companies: 117 original equipment manufacturers (OEM), 558 motor remanufactures, 155 motorcycle assemblers, 65 engine makers and 1540 motor vehicle parts and components companies.

Table 2.1. Number of Motorcar Producers and Parts & Components Suppliers

Year	No. of Motor Vehicle Enterprises	No. of Parts & Components Suppliers
1976	53	1684
1980	56	2076
1985	114	2366
1990	117	1894
1997	119	1618
1998	119	1628
1999	118	1540
2000	118	1480
2001	116	1558
2002	117	1540

Source: *China Automotive Industry Yearbook 2003*

Second, the production mix was adjusted to produce more heavy-duty and light-duty vehicles to meet the increased demands due to rapid development of the infrastructure and construction projects. Before the 1980s, the government did not allow people to buy motor vehicles and did not want to produce sedans for individual use. When such a restriction was removed in the mid of 1980s, demand for sedans increased rapidly. In the 1990s, the government even tried to promote passenger car production. Table 2.2 shows both the rapid growth of domestic production and changes in product composition.

Table 2.2. Annual Production and Share of Domestic Motor Vehicles

1991	1995	1999	2001	2002
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Vehicle Type	Volume (unit)	sShare (%)	Volume (unit)	Share (%)	Volume (unit)	Share (%)	Volume (unit)	Share (%)	Volume (unit)	Share (%)
Total Vehicle	708,820	100	1,452,737	100	1,831,596	100	2,341,528	100	3,253,655	100
Trucks	452,023	64	721,822	50	756,312	41	803,076	34	1,092,546	34
Buses	175,742	25	405,454	28	509,179	28	834,927	36	1,068,347	33
Sedans	81,055	11	325,461	22	566,105	31	703,525	30	1,092,762	34

Source: *China Automotive Industry Yearbook 2003*

Third, in order to promote technological innovation and enhance product quality in the local assembly plants, foreign auto corporations were encouraged to make investments in China, through the joint venture format. In 1983, the Beijing Jeep Corporation, the first Sino-foreign joint venture in the auto industry, was formed by the Beijing Automobile Corporation and the American Motors Corporation (AMC). In 1985, Shanghai Automobile Corporation and Volkswagen (Germany) set up their joint venture called Shanghai-Volkswagen Automobile to produce the Santana model. In 1990, the FAW and Volkswagen established the FAW-Volkswagen Corporation to produce Audis and Jettas. In the same year, the SAW set up Shenlong Mobile Corporation, a joint venture with the French Citroen Co. Ltd. to produce Citroen models.

Table 2.3 indicates the distribution of motor vehicle enterprises with different sizes in 2002. Among all 117 car manufacturers, only seven plants have annual production over 100,000 cars and six others have annual production over 50,000 cars. Most others are small in scale and therefore not efficient.

Table 2.2. Classification of Motor Vehicles Producers According to Production in 2002

Annual Production (units)	Number of firms
Over 100,000	7
50,000 - 100,000	6
10,000 – 50,000	15
Less than 10,000	89
Total	117

Source: *China Automotive Industry Yearbook (2003)*

As the demand for imported cars especially sedans increased over time, China has shifted its product mix from predominately medium-range loading vehicles to lighter trucks and passenger cars. In the early 1990s, 71% were trucks, 21% were buses and only 8% were cars. The percentage of trucks decreased continuously over time and accounted for only 33.6% of total production in 2002. The annual production, growth rate and market share of domestic-made sedans are shown in Table 2.4. The average growth rates of sedan production were 128% in the 1980s and 303% in the 1990s. The growth of sedan production remained very strong at the beginning of the 21st century. This trend can be seen vividly in Figure 2.1. The market share of truck production fell sharply over the period from 1990 to 2002. On the contrary, the market share of buses and sedans rose during the same period. In 2002, each product group accounted for about one-third of total motor vehicle

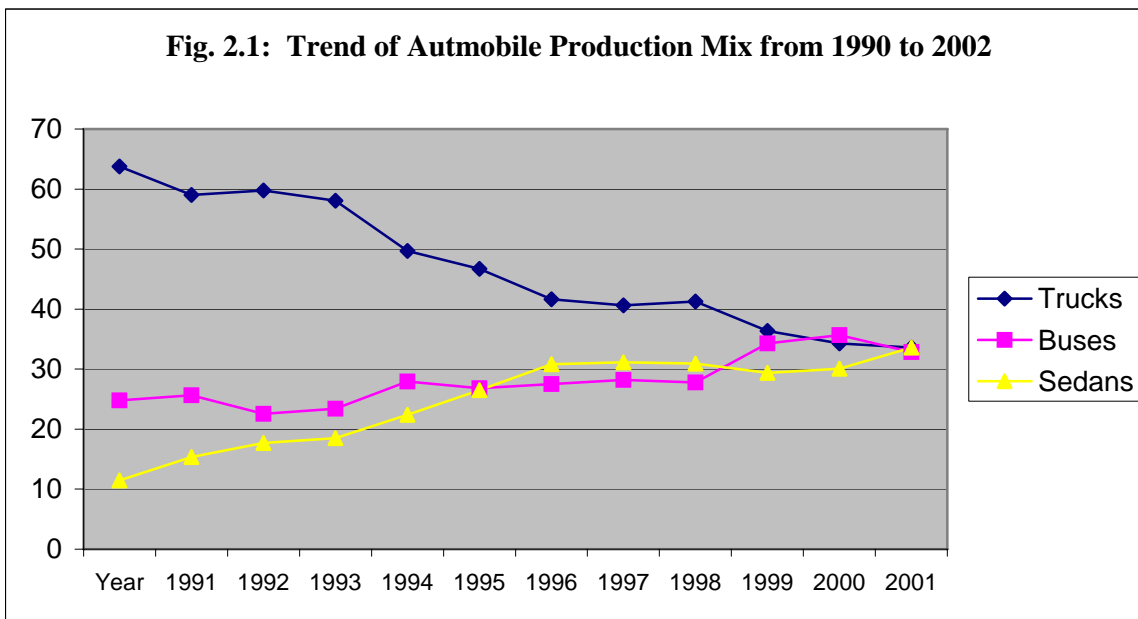
production (trucks for 33.57%, buses for 32.9%, and sedans for 33.59%). This was the first time that sedan production exceeded truck production in China.

It is worth pointing out that although the sales of sedans increased rapidly over the past 20 years, the ownership rate of private cars in China is still very low. One in every 10,000 people in China owned a car in 1985, and one in every 210 people owned a car in 2000.¹ The change is spectacular, but it also suggests that there still exists great potential in China's sedan market.

Table 2.4. Production, Market Share and Growth rate of Sedans

Year	Motor Vehicles (10,000 units)	Sedan (10,000 units)	Market share (%)	Growth rate (%)
1980	22.2	0.5	2.25	-
1985	43.7	0.9	2.06	-
1990	51.4	3.5	6.81	-
1995	145.3	33.7	23.2	-
1998	163.0	50.7	31.1	-
1999	183.2	57.1	31.2	12.62
2000	207.0	60.7	29.3	6.30
2001	234.2	70.4	30.1	15.98
2002	325.4	109.2	33.6	55.11

Source: *China Statistical Yearbook 2003*



Source: *China Automotive Industry Yearbook 2003*

¹ The figures are obtained from Holbig, H. & Ash R. (2002) *China's Accession to the World Trade Organization, National and International Perspective*, New York: Routledge Curzon.

The domestic market is dominated by a few large auto firms. The FAW Group is the largest local automotive manufacturer. In 2002, its motor vehicle output was 561,787 cars, the largest in the domestic industry. It produces sedans, buses and trucks. Hongqi is its flagship sedan. Its Jiefang series of buses and trucks account for large market shares across the country. Table 2.5 shows FAW's performance in recent years. As the cost information is not available in the company's report (*FAW Annual Report*), we estimate the average costs using sales and profits information. In general, we can see the economies of scale effects: the average cost drops as production increases. Partly because of that, the company's net profits also increased, from 1.57 billion yuan in 1999 to 5.8 billion yuan in 2003. The increase in the net profit margin implies improved efficiency of the company. The company's total assets increased by more than double from 1999 to 2003. Its other financial indicators are also very healthy.

Table 2.5. FAW's Performance between 1999 and 2002 (yuan)

Year	Sales (units)	Total Sales Revenue (billion)	Net Profit (billion)	Net Profit Margin	Average Cost	Total Assets (billion)
1999	334,600	45.371	1.569	0.0346	122,056	458.140
2000	409,200	56.400	2.274	0.0403	122,801	555.950
2001	402,794	62.816	2.800	0.0446	136,673	632.390
2002	580,356	84.510	4.330	0.0512	129,153	888.420
2003	902,329	114.000	5.800	0.0509	110,680	934.651

Source: *FAW Annual Report* (1999 - 2003)

The second largest automotive firm in China is the Shanghai Automotive Industrial Corporation (SAIC). SAIC started its production in the 1960s on a small scale. In the 1980s, it cooperated with Volkswagen to form a joint venture. Since then, its production and market share have increased rapidly. The company's production in 2002 doubled its 2001 level. As shown in Table 2.6, the company's sales revenues, net profits and total assets grew very fast in recent years. SAIC's profit margin is much higher than FAW's, indicating SAIC's superior efficiency, product quality, management and marketing ability.

Table 2.6. SAIC's Performance between 2000 and 2002 (yuan)

Year	Sales (units)	Main Sales Revenue (billion)	Before Tax Profit (billion)	Total Assets (billion)
2001	230,281			
2002	537,479	82.092	17.940	77.438
2003	782,036	125.818	30.419	95.677

Source: *SAIC Annual Report* (2002-2003), *China Automotive Industry Yearbook* (2004)

Jiangling Motors Corporation is a medium-size automotive manufacturer in China. From Table 2.7 below, we can see that this medium-size firm also experienced rapid growth in sales, profits and asset accumulation. Although Jiangling is much smaller than the FAW Group, its profit margin is higher. This indicates that a medium size auto firm can perform well in the market.

Table 2.7. Jiangling Motor's Profit Performance between 2002 and 2003 (yuan)

Year	Sales (units)	Main Sales Revenue (billion)	Net Profit (billion)	Net Profit Margin	Total Assets (billion)
2000	26186	2.825	0.05		4.302
2001	37140	3.379	0.10	0.0298	3.667
2002	51172	4.271	0.29	0.0671	3.582
2003	58518	5.095	0.45	0.0881	3.802

Source: *Jiangling Motor's Annual Report (2003)*, *China Automotive Industry Yearbook (2004)*

3. Analysis of the structure of China's Automotive Industry

In Section 2, we reviewed the development of China's automotive industry and some auto firms' performance. In this section, we take a closer look at the main structural features of China's motor vehicle industry. We use Michael Porter's (1980) Five-Force model to analyze the industry. Porter's five forces consist of entry, threat of substitution, bargaining power of buyers, bargaining power of suppliers and rivalry among current competitors. These five forces jointly determine the intensity of competition within the industry and in turn help firms to set their strategies.

3.1. Entry

New entrants to an industry will bring new supplies, new ideas and new competition. They also seize market share and profits from the incumbent firms. In an oligopolistic market, where there are only a handful of firms in competition, incumbents would like to use various methods to deter new firms from entering the market. However, entry deterrence devices are costly. Therefore, the threat of entry is crucial to existing firms' profitability.

What is the threat of entry in China's automobile industry? Is it very high or very low? What factors affect the level and speed of entry? We analyze domestic entry, foreign entry through imports and foreign entry through foreign direct investment (FDI).

Domestic entry. First, motor vehicle manufacture is a capital-intensive business that requires very large fixed capital investments in machinery, equipment, land, factories and fabrication and testing of prototypes before formal production. Even for an existing firm that has made these investments, it still needs to devote a huge amount of resources to research and development (R&D) and marketing to introduce new models, obtain technological breakthroughs, and maintain and raise consumers' loyalty and the firm's market share and profits. All these actions require long-term investments, which cannot be recovered within several years. This feature makes it

difficult for potential entrants to enter the market because first they need to raise sufficient capital and second they must prepare to bear the debt for a long period of time. The Chinese state industry policy in fact requires a company to have a minimum 2 billion yuan in order to make investments in this industry.

Second, this industry is characterized by very large economies of scale and economies of scope. Economies of scale exist when the average production cost decreases as output increases. Economies of scope exist when the average cost decreases as more product varieties are produced. The above-mentioned large fixed investment is the most important factor of the economies of scale and scope in this industry. For example, in recent years, many large automakers developed their new car models based on the same platform to save costs as they have large customer pools to absorb different models. “Learning by doing” is another important factor. Firms accumulate their experiences from past production and competition. These experiences help to improve efficiency and competitiveness. All the above are disadvantages for new entrants. Economies of scale and scope put potential entrants in very disadvantageous positions because they are small in both scale and scope at the time of entry and they have no prior experiences. As for car production, it is believed that a carmaker obtains the efficient level of production once its annual production has reached 100,000 units. According to Table 2.3, there are only seven automakers in China that have reached this threshold. For various stages of the automotive production, the following table (Table 3.1) shows the minimum efficient scales.

Table 3.1. Minimum Efficient Scale for Different Parts of Motor Vehicles

Activity	Amount needed to obtain minimum unit costs
Casting engine blocks	1 million
Casting other parts	100,000 - 750,000
Power train machining/assembly	600,000
Axle making/ assembly	500,000
Pressing various panels	1-2 million
Painting	250,000
Final assembly	250,000
Advertising	1 million
Finance	2-5 million
R&D	5 million

Source: Nolan (2001).

It is clear that most existing local automakers in China are not efficient. They are neither large enough to produce the efficient level or diverse enough to produce a range of models. Nevertheless, they are still staying in the market due to factors such as local government assistance and protection. However, it is clear from Table 3.1 that entry is no longer profitable. In the past decade, the number of firms in the market has remained almost the same, around 117, although there might be a few new entrants replacing a few exiting firms.

Will the below-efficient firms be able to survive in the future? Will any small firms ever be able to enter the market? Most people answer no to these questions. However, the reality seems to

suggest the opposite. First, the rapid economic growth has led to increasing demand for motor vehicles, especially private cars. Because of heavy import restriction (discussed later), Chinese people have to look for locally made cars. This gives robust market support for the local industry. Second, because of the import restrictions, many local governments have regarded developing the regional automotive industry as a main target and have started to support local state-owned enterprises (SOEs) in building automobile assembly plants even when they have no comparative advantages in this product.² These firms can survive temporarily under the local subsidies and import restrictions. It is well recognized that interregional protection was very strong in the late 1980s and early 1990s. Third, China is a large developing country. The income distribution is very unequal. While there is strong demand for luxury cars, there is also strong demand for low-price low-quality cars. Many existing firms and foreign firms do not produce low-end cars. This gives opportunities for potential entrants or some small incumbents who cannot compete with high-end and medium cars. The Geely (吉利) is one such example. Other examples include Chery (奇瑞), AUX and Chunlan (春兰) models.

Import competition. China's automotive industry was far behind the advanced countries in the 1980s and 1990s. It is clearly an infant industry. There is no doubt that given the large technology gap, without import protections, foreign entries will easily wipe out the domestic industry. In order to develop the domestic motor vehicle industry and encourage technology transfer, the Chinese government imposed strict licensing requirements and heavy tariffs on imported vehicles and components before its accession to the WTO. For instance, the tariffs on imported diesel engines were about 35% in 1994. With the high protection, domestic automakers can buy time to develop themselves.

However, when China wanted to join WTO in the 1980s and 1990s, foreign countries put pressure on China to open its automotive industry. The domestic automakers realized that foreign entry would become easier and the duration of import protection would be shortened. In the mid-1990s, China started to lower tariffs and to reduce the use of import quotas gradually to help local companies prepare themselves for international competition. Tariff on imported motors fell from 180%-220% in 1992 to 100%-120% in 1996. In 1999, the tariff was further reduced to 50%-80%.

With the gradual trade liberalization, automobile imports increased over time. This created competition for the local producers. Moreover, the structure of automobile imports has also changed over time, with the share of private cars getting larger and larger. In 1994, China imported 283,000 motor vehicles, of which 61% were sedans. As a result of this, in 1995, auto imports occupied 43% of China's sedan market. Thus, although import protection and local subsidies made opportunities for the local industry to survive, local producers still face tough international competition. It is interesting to note from Table 3.2 that the imports of sedans actually dropped in the mid-1990s and then picked up again in recent years.

² For example, according to *China Daily* (May 1997), "at present, 22 provinces, autonomous regions and municipalities have chosen the automobile as their local growth choice. A new round of repeated construction has begun."

Table 3.2. Imports of Sedans

	1990	1991	1992	1993	1994	1995	1996
Units	34,063	54,009	115,641	180,717	169,995	129,176	57,942
Percentage %	52	55	55	59	60	82	76
	1997	1998	1999	2000	2001	2002	2003
Units	32,019	18,016	19,953	21,620	46,632	70,329	103,017
Percentage %	65	45	57	51	65	55	60

Source: *China Automotive Industry Yearbook* (various issues).

FDI. An important feature of China's automobile industry is the role played by foreign multinationals (MNEs) who made direct investments in China. On the one hand, as trade protection is very high in China's auto market, FDI became a more effective way for MNEs to enter China's market. On the other hand, the Chinese government wanted domestic automakers to catch up with international companies and hence encouraged foreign companies who entered China to cooperate with local partners to form joint ventures. It also set strict regulations to help local producers. For example, foreign automakers are not allowed to set up wholly foreign-owned enterprises to produce automobiles in China. They must find local partners for form joint ventures. Moreover, local partners must possess at least 50% of the shares of a joint venture. Each foreign investor must not establish more than two enterprises producing the same type of vehicles. In addition, the government set domestic content requirements that require a joint venture to purchase a certain percentage of its auto parts and components within China. If a joint venture fails to achieve the requirements, it would be punished by paying high tariffs on imported parts and components. For example, from 1993 to 1997, the Guangzhou Peugeot joint venture was subject to 32% import tariffs on components if the domestic content was greater than 80%; if the domestic content was less than 60%, the tariff was increased to 60%.

Thus, local producers did not worry too much about pure domestic entrants because they would not be genuine competitors. Neither were local producers afraid of pure foreign automakers from imports since imports were heavily restricted. However, they faced serious entry threats from FDI. Due to the joint venture restrictions, local firms were competing in forming joint ventures with foreign partners. This unique characteristic of the market environment gives the local industry a dilemma: they don't like new entrants, but they are in a hurry to find foreign partners to come in the market.

On January 15, 1983, the first joint venture in China's auto industry, Beijing Jeep Corporation, was formed by the Beijing Automobile Corporation and the American Motors Corporation (AMC). In 1985, SAIC and Volkswagen set up their joint venture called Shanghai-Volkswagen Automobile to produce the Santana. For many years, this joint venture was not only the largest automaker in China, but the largest foreign-funded enterprise in China in terms of annual sales. In 1990, the FAW and Volkswagen established the FAW-Volkswagen Corporation. It produces Audi and Jettas. In November 1990, the Second Automotive Works (SAW) set up Shenlong (神龙) Dongfeng Peugeot Citroen Automobile Company Ltd (DPCA) with the French

Citroen Co. Ltd. There were also some other auto joint ventures established in China around the same time, which include Beijing Citroen, Tianjin Daihatsu and Guangzhou Peugeot. Due to rapid entry of foreign firms through FDI, China's sedan market has been dominated by joint ventures since the 1990s. From 1992 to 1995, for example, over 60% of China's domestically produced sedans were made by Sino-foreign joint ventures. This figure reached 90% in 2004.

In summary, since there are already too many firms in the market, pure local entry is very unlikely except in the low-end car segment. It is also unlikely that local governments will heavily subsidize new entrants because the central government has been discouraging this type of investment. Most world-class automakers have already established their joint ventures in China and therefore new joint ventures will not be many. However, there are two important policy changes that would lead to new entry and competition. Both are the result of China's WTO accession and its promise to comply with WTO obligations. First, import tariffs will be reduced drastically and quotas will be eliminated eventually. Import competition can be expected to rise. Second, China needs to comply with the National Treatment principle of the WTO on its FDI policies. It has already abolished the domestic content requirements. This allows the joint ventures to achieve cost reductions and quality upgrades more easily. Moreover, the equity share restriction should be removed. Joint ventures might turn into 100 percent foreign owned. In that case, local producers will face true foreign MNE competition.

3.2. Threat of Substitution

Demands for automobiles are affected by many factors including product quality, income level, road conditions, parking space and government regulations. They are also affected by the availability of other substitutes for automobiles. In China's case, we need to focus on what are the traditional means of transportation, how governments develop urban public transportation systems, and the new means of transportation. With rapid economic growth for more than twenty years, an increasing number of Chinese families can now afford to buy their own cars. However, other transport means such as bicycles, motor cycles and mass transit are good substitutes for cars for people to travel short distances. These substitutes restrict the potential growth of and returns to the automobile industry. The growth of these substitutes can reduce demand for cars and consequently impose price pressures and limit profit margins for automobiles.

Bicycles. Bicycles are still the most common daily transport means for most people in China including workers, students and housewives. There are many advantages to using bicycles. They are cheap and therefore can be afforded by most people. They do not consume gasoline and save cost. In small cities, people do not travel long distances to work and therefore a bicycle is sufficient for daily commuting. There is a general shortage of parking spaces for cars and so bicycles become a natural choice. Also, many people believe it is a good exercise to ride bicycles every day between home and their workplaces.

Table 3.3 shows the total production of bicycles in China and the country's total exports. The difference can be considered as domestic sales.

Table 3.3. China's Total Bicycle Production and Exports

10,000	1997	1998	1999	2000	2001	2002
Output	2999.29	2312.49	2397.57	2906.79	2902.26	3957.52
Exports		1761	2270	3286	3494	4556

Source: *China Statistic Yearbook* (various issues).

The continuous growth of the use of bicycles and automobiles in China leads to an interesting phenomenon. In most cities you can find a mix of cars and bicycles on the roads. Bicycle riders and car drivers compete to use the road and often no one is willing to let the other go first. This creates traffic confusion and is dangerous to travelers as well as pedestrians. In 2004, Shanghai, one of China's most modern and highly developed cities, restricted people from using bicycles along the main avenues. It is likely that other large cities will follow this regulation. Indeed, the use of bicycles, once accounting for over 70% of travelers in Shanghai, has fallen to about 15% to 17% now according to recent research done by the Shanghai government. The local government closed the main roads to bicycles because the people in Shanghai are more willing to travel by cars. Many city dwellers live in the periphery of the urban areas and hence prefer to drive cars. Increasing car ownership and usage increase the risk of bicycling along the road and expose the bicycle users to polluted air. Such policy changes further reduce bicycle use.

Although there are a lot of advantages to bicycles, cars are a symbol of economic and social status. Most Chinese families would like to own a car as long as they can afford it. Therefore, as family income continues to increase, bicycles, as a substitute for cars as a transportation means, should not be a threat to the demand for automobiles in China.

Motorcycles. China has become the largest motorcycle-producing country in the world and has the largest motorcycle-consuming market in the world. In 2002, the output of motorcycles was 13 million, which was half of the world's total output.

Now, in China there are about 60 million motorcycles in use and the market potential for motorcycles has been estimated to be over 200 million.

Because motorcycles contribute more traffic congestion, gas emissions and noise pollution than public transport means, many big cities in China have adopted strict policies through tax increases, stopping motorcycle training programs and suspension of granting motorcycle driver's licenses, etc. The cities that restrict the use of motorcycles include Beijing, Shanghai, Guangzhou, Tianjin, Nanjing, Wuhan, Hangzhou and Xiamen. Xiamen has restricted motorcycle usage since 1987.

In the next few years, however, there will still be a large demand for motorcycles in countryside and small cities because in these areas motorcycles are swift, quick and can be used for deliveries.

Public transportation. As the average income of urban residents is higher than the average income of the entire country, motorization has developed rapidly in the eastern coastal region and has brought traffic and environmental problems to the cities. However, the development of urban road is far behind the growth rate of urban vehicle fleets, resulting in serious traffic jams and longer commuting time. Streets are narrow in most parts of China even in urban areas and hence it is inconvenient to travel by cars to several places. Besides, motor vehicles emit gases that pollute the

air. The increasing number of automobile is one of major causes of air pollution in China. Furthermore, it is difficult to find a parking space in urban areas due to the lack of city planning and the dramatic increase in the number of cars used on the road. Road networks are developing but cannot catch up with the number of motor vehicles. In most provinces, especially in inland China, rural roads virtually do not exist or are of poor quality. It is difficult for car to pass through. Recognizing these difficulties and drawbacks, local governments have expended great effort in developing a good public transportation system within a city.

Ever since the late 1970s, public transportation in Chinese cities has developed quickly. But with the even more rapid population growth and city expansion, the problems of traffic congestion and journey inconvenience have become more and more serious. Since 1992, many cities, including Shenzhen, Hangzhou, Shanghai, Nanjing and Beijing, have reformed their urban public transportation systems to be more market or demand driven. For example, the construction of the public transportation infrastructure should take into account the increased demand for passenger cars. At the end of 2002, the Ministry of Construction decreed that the marketization process of municipal public utilities (including urban public transportation) should be expedited.

Due to the increasing traffic congestion problems, on March 17, 2004, the Ministry of Construction published the *Advice on Urban Public Transportation Development* in order to ensure the important position of public transportation in urban traffic systems. In response, Beijing will spend more money on developing its public transportation system, especially the subways. Subways have the advantages of no congestion and being punctual. They are also safer and more environmentally-friendly than cars and buses.

Taxis. Taxis are another substitute for private cars. Beijing had 64,000 taxis in 2000. Zhengzhou had 13,248 in 2003; and Shanghai had 42,000 in 2004. On average, there are 6,000 to 7,000 taxis in large cities. Taxis are either too expensive for low and middle income families to rely on for daily commuting or not good enough for rich families compared to owning private cars.

Railways. Intra-city public transportation solves traffic problems and reduces demand for private cars. However, there are increasing numbers of people who drive their cars between cities and between provinces, thanks to the construction of highways. Inter-city travel has become more and more important, especially for business people. It is easier to drive cars than to use the railways. Moreover, business people can use their own cars when they do business in another city. A substitute for this type of car use is a network of railways. Railway networks and facilities in China have undergone significant improvement since the 1980s. After the economic reforms began in 1979, the objective of railway development shifted from quantity to quality as well as extension of the network. A number of new lines have been built. In 1994, China's first quasi high-speed railway, the Guangzhou-Shenzhen line was opened for usage with maximum speed of 160 km/hr. Afterwards, the speed of trains was enhanced year after year. In 1997 and 1998, new trains with the speed of 140-160 km/hr were used along three railway lines: Beijing-Guangzhou, Beijing-Shanghai and Beijing-Harbin. Other facilities such as a computerized reservation system, telephone ticket booking, and bus style train travel enhance the quality of train services and in turn promote the popularity of railway services to the public. Four railway development plans were carried out in 1997, 1998, 1999 and 2001, which affected most major railways. The average speed

of passenger trains has increased by 25%. In particular, the speed of the Guangzhou-Shenzhen trains reaches 200 km/hr.

During the tenth Five-Year Plan period (2001-2005), China's railways plan to carry out two nationwide development projects, one in 2003 and another in 2005. It will set up a national express passenger network in three important transportation hubs: Beijing, Shanghai and Guangzhou. It will also invest Rmb350 billion on further railway development. Thus, the railway services would become more advanced and convenient to the passengers. It is expected that the price of train travel will be further reduced. Additional benefits of railway transportation compared to automobiles are that trains can carry more people, travel longer distances, and emit less pollution.

Trains are a substitute for cars to some degree, but for long distance travel, automobiles have their own advantage that trains cannot supply. One is its symbol of social and economic status. Chinese people are eager to buy cars, as cars are luxury goods. Traveling by car is also convenient. If you drive, you do not need to wait at the train or subway stations, especially during rush hours and public holidays. Traveling by car also allows people to move from spot to spot where railways do not reach.

In summary, it is likely that automobiles will replace bicycles over time in big cities. In small towns, this will not happen. However, bicycles are not substitutes for cars in those areas because people in small towns generally have low incomes and most of them cannot afford to own cars in the near future. The result is simply that the demand for cars will not increase too fast in those areas. Governments have invested a lot to improve the transport network and public transportation quality. These systems can be viewed as a substitute for automobiles. However, we should note two points. First, the improvement of roads and highways boost demand not only for public transportation such as buses, but also for private cars. Second, economic growth leads to increased demand for both public transportation and private cars. In this sense, the growth of public transportation would not harm the private car market. Trains and motor vehicles have their respective advantages. They will not substitute for each other. Trains are more efficient and cost effective transport means for long-distance travel while automobiles are more advantageous for short-distance travel. Thus, the threat of other transport means to automobile exists but is not really harmful to the whole automotive industry.

3.3. Bargaining Power of Buyers: Demand

In the past, the local automotive industry was highly protected by extremely high tariffs and strict import quotas and licenses. Consumers of automobiles were mainly government agents and SOEs. Even though consumers were large companies or government units, there was no bargaining between consumers and automakers because prices were not determined by supply and demand, but by government plans. The situation did not change much in the 1980s. Private demand for automobiles started in the 1990s. Tariffs also started to decline and import quotas began to expand. However, like with many other consumer goods, consumers in China are not organized and individual consumers do not have any bargaining power against the automobile producers. Consumers simply take the market price as given and make their individual decisions on purchasing. Hence, instead of discussing individual buyers vs. producers, in this part we focus

on analyzing the factors that affect the aggregate demand for automobiles. Once demand is determined, automakers compete in the market to set their prices.

China has experienced tremendous growth in motor vehicle production in recent years. The number of motorcars produced in China increased from 0.22 million in 1980 to 2.07 million in 2000, 2.34 million in 2001, and 3.26 million in 2002. The total sales of automobiles were valued at 8.6 billion yuan in 1980. This increased to 245.8 billion yuan in 2001 and 340.7 billion yuan in 2002, a 38.6% increase in 2002.

It is an empirical challenge to estimate the demand for automobiles in China because we cannot observe the demand function directly. What we can observe is the equilibrium sales and prices in the market. Economists in the U.S. have tried to estimate car demand in the U.S., Japan and the EU. Some scholars in China have also tried to apply the same methodology to estimate the demand for automobiles in China. Instead of discussing the econometrics analysis of automobile demand, we focus on describing a number of possible factors that affect the demand for automobiles in China. These factors are income, road construction and car licenses.

3.3.1. Income

Income is one of the most important factors that determine demand levels for automobiles. Personal income is the major factor in affecting the demand for sedans, and the whole country's economic activities affect demand for all types of motor vehicles. Table 3.4 shows the strong growth momentum of the Chinese economy and its comparison to other economies in the region. Despite the Asian financial crisis, China has been the fastest growing economy in the world for a long period of time. An increase in national income implies a rise in living standards and purchasing power, which should generate robust demand for automobiles.

Table 3.4. GDP Growth Rates in China, Hong Kong, Korea, Singapore and Taiwan (%)

	China	Hong Kong	Korea	Singapore	Taiwan
1995	23.19	6.46	23.32	10.30	8.49
1996	16.27	10.46	12.48	9.31	9.24
1997	9.41	11.04	9.48	8.93	8.09
1998	5.23	-4.81	-1.43	-3.22	7.00
1999	4.59	-2.63	9.38	0.62	4.10
2000	9.50	3.39	9.29	14.33	4.56
2001	8.47	-1.43	7.51	-3.57	-1.10
2002	8.17	-1.77	9.99	2.41	3.00

Source: *China Statistical Yearbook and International Financial Statistics* (2004)

Personal income is a more important factor in affecting the demand for private cars than a country's total GDP level and growth. Table 3.5 shows the strong correlation between personal income growth and automobile sales growth, in particular, the growth in the sale of sedans. It is about a three-year time series. Nevertheless, the correlation between per capita GDP and sales of motor vehicles is 0.96 and the correlation between per capita GDP and sales of sedans is 0.94. This indicates a strong positive correlation between the demand for automobiles and personal income. Note that, in 2002 China's per capita GDP was still below US\$1,000. Experience shows that there

will be a big boost in automobile demand once a country's per capita income reaches US\$3,000. Because China has a huge population and the income inequality is large, we do not have to wait until China reaches this common critical income level to see robust demand for automobiles, however.

Table 3.5. per capita GDP, Sales of Motor Vehicles & Sedans (Yuan), 2000-2002

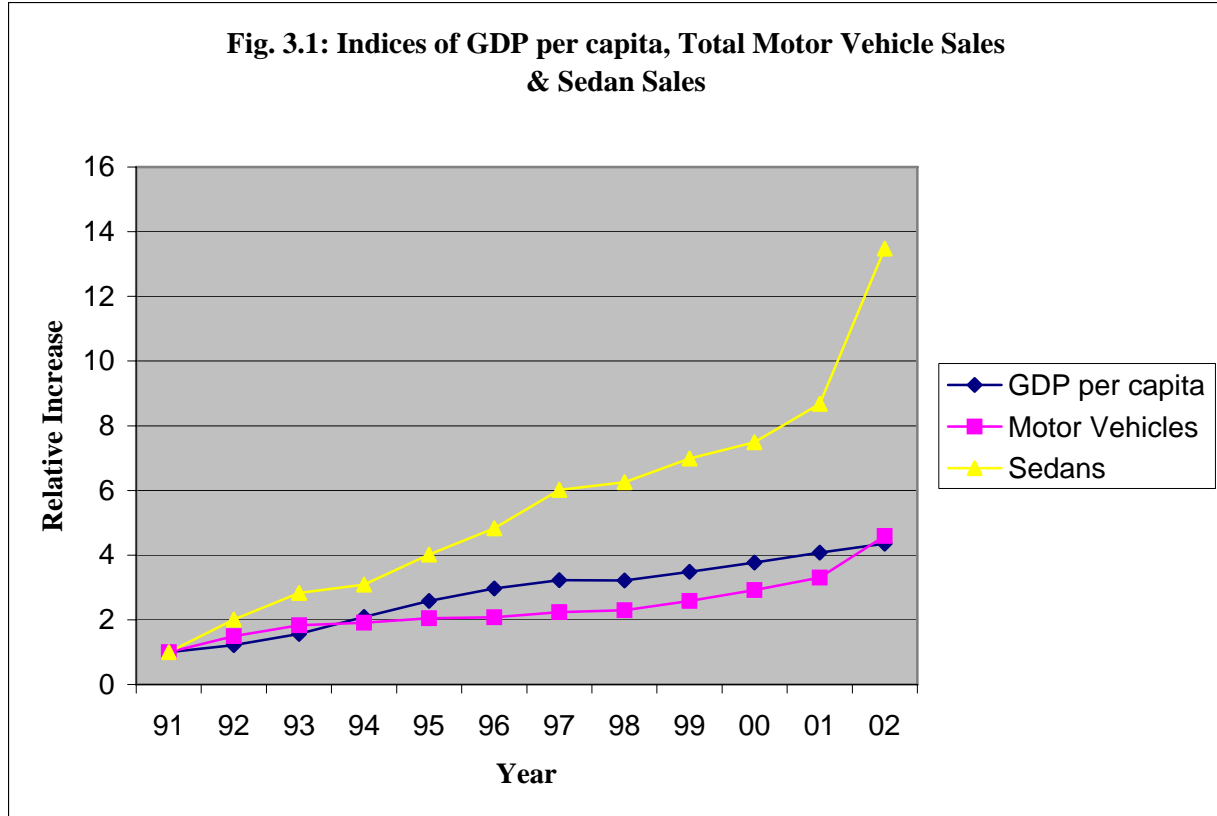
	per capita GDP	Total Sales of Motor Vehicles	Total Sales of Sedans
2000	7086	2078382	614411
2001	7651	2371089	721463
2002	8184	3248511	1126468

Source: *China Automotive Industry Yearbook* (2002 and 2003)

The per capita GDP of China increased from 460 yuan in 1980 to 8184 yuan in 2002, with an annual growth rate of 25% on average. Demand for automobiles increases together with economic growth as people's purchasing power increases over time and more and more people jump from the necessity-consumption group to the luxury-good-consumption group. They purchase cars for business or private use. At the same time, as a result of high economic growth, the society has more money to develop and improve its transport network and road infrastructure such as highways. Therefore, demand for automobiles is further boosted. The effects of economic growth on automobile demand can be seen clearly in Figure 3.1, which depicts the following three indices with 1991 as the base year: per capita GDP, total motor vehicle sales and total sedan sales.³ It is clear that the income effect on sedan demand is stronger than that on all motor vehicle demand. This graph may serve as a base for forecasting future demand for automobiles in China once we have the forecast for GDP growth.

³ The index is obtained here using 1991 as the base year with the value of a variable in each year being divided by the value of the same variable in 1991.

Fig. 3.1: Indices of GDP per capita, Total Motor Vehicle Sales & Sedan Sales



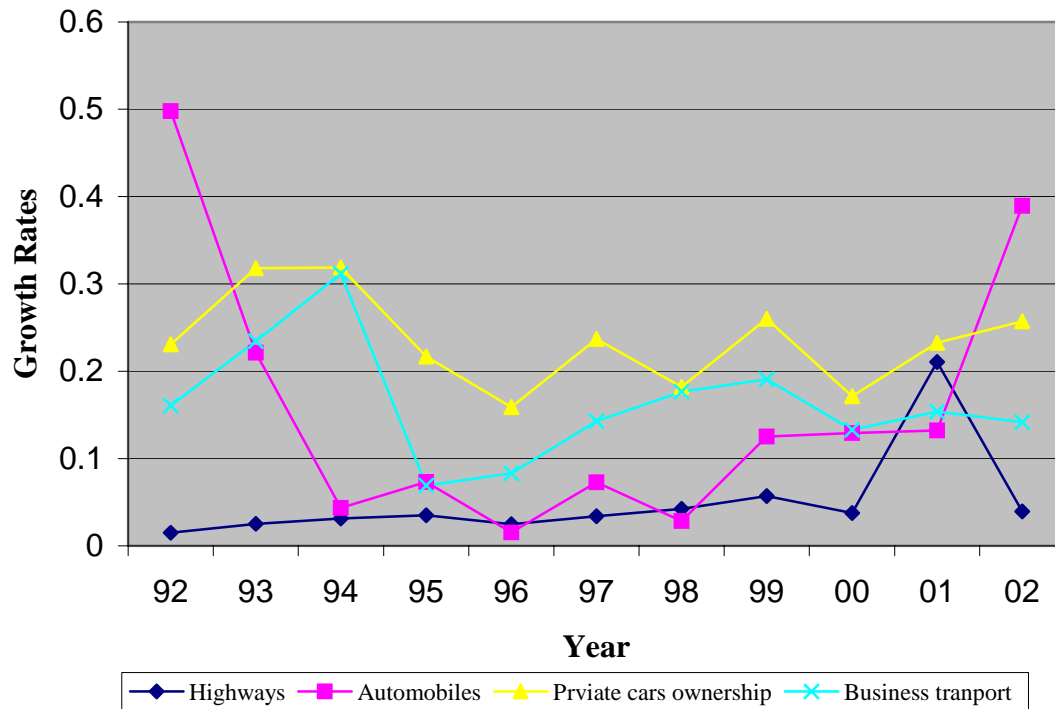
Sources: *China Automotive Industry Yearbook* (2003) and *China Statistical Yearbook* (2003)

3.3.2. Road Construction

High economic growth is a necessary condition for the increasing demand for automobiles. However, if governments do not invest sufficient amounts of funds to build more roads in cities and highways to connect cities, demand for automobiles will be curbed. It is often observed that many streets and roads in China are not suitable for cars to pass over, especially in rural areas. Even in cities, as more and more cars are used, there are a more and more severe traffic jams, especially during rush hours. A natural question is whether the current development of road construction is far behind the demand for automobiles.

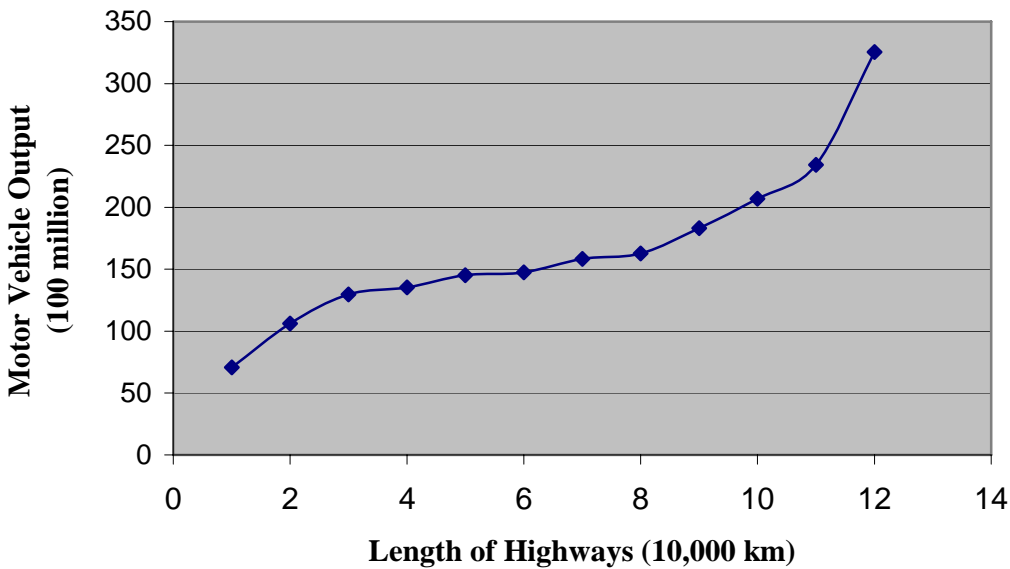
Let us take a close look at the recent history of highways development and car ownership. Figure 3.2 depicts the growth rates of highway construction, automobile sales, private car ownership and commercial vehicles. It is clear that the growth rate of highway construction is lowest, implying increasing frequency of traffic jams. Building highways requires large investments and takes a long period of time. The backwardness of highway construction will eventually have a negative effect on automobile demand. The growth rate of private car ownership is the highest, implying the changes in consumption pattern in China's automobile market in favor of sedans. To make a sharp comparison, we plot data on the length of highways in comparison with automobile production in Figure 3.3. The figure indicates that the development of highways is far behind the growth rate of motorization. Road construction is not adequate.

Fig. 3.2: Growth Rates of Highway Construction, Automobile Output, Private Car Ownership and Business Transport



Sources: *China Automotive Industry Yearbook (2003)* and *China Statistical Yearbook (2003)*

Fig. 3.3 Motor Vehicle Output vs. Highway Length



The problem resulting from the slow development of roads and highways is more serious in big cities than in rural areas. For example, in Beijing, the number of private cars exceeded two million in 2003. There is a severe shortage of parking space (estimated over 20,000 short in supply). Due to serious traffic jams during rush hours, people have to take public transportation even though they own cars. That is fine, but the quality of public transportation is not very good and some, such as buses and taxi, are also subject to the traffic jam problem. Moreover, the number of traffic accidents is increasing every year. In 2001, there were about 750,000 road accidents, 105,930 people died and 546,485 people were injured in the whole country. The figures are respectively 22%, 13% and 31% higher than the previous year.

In order to minimize traffic problems, regional governments at various levels have launched many projects to develop their local transport networks and widen their roads. For instance, the Beijing government has spent over 10 billion yuan in recent years to build more roads and improve existing roads. The total road length of Beijing city increased by more than 2000 kilometers from 1997 to 2002. The Beijing government carried out a new road construction project in 2004, including building several new roads, extending existing roads in the western and southern parts of the city, and widening several secondary roads such as Dayangmao road. The Shanghai government started its middle-ring road project with 70 kilometers in 2003. This road will be the major road connecting the city and its suburban area. Qinghai Province in 2004 began to construct new expressways, which will reach 216 kilometers and strengthen the road network of the province especially in Xining City. Shangdong Province will spend 12 billion yuan on road construction in the next few years. The central government also spent about 700 billion yuan on road construction in the western part (the less developed part) of the country. All these projects are meant to solve traffic problems and raise demand for automobiles.

3.3.3. Car Registration and Licenses

From Table 3.6, we can see that there were more than two million new passenger vehicles and close to one million new trucks registered in China in 2002. In particular, the seven largest registration regions account for about 60% of total new automobile registrations. As we can see, these are mainly in the eastern coastal regions, where the economies are highly developed.

Table 3.6. New Registration Statistics on Private Vehicles in Major Regions in 2002

Region	Passenger Vehicles	Trucks	Total	Share (%)
Hebei	284,144	189,171	489,563	14.52
Guangdong	242,230	11,865	338,634	10.04
Zhejiang	28,704	182,953	272,710	8.09
Shandong	73,568	179,295	265,097	7.86
Beijing	235,524	18,503	258,298	7.66
Jiangsu	141,059	46,715	191,910	5.69
Shanghai	91,804	18,736	110,540	3.28
National Total	2,294,649	993,761	3,371,951	100

Source: *China Statistical Yearbook*, 2003.

A country like China faces a dilemma. On the one hand, it wants to develop its local automobile industry and thus encourage private car ownership. Policies to promote car ownership include introducing car loans to individual consumers to help middle-income families to purchase cars. On the other hand, the government has to consider environmental and traffic problems. Policies on new car registration should be implemented to control the growth of car ownership. The government has to balance these desires and problems in considering short-term economic prosperity and long-term economic sustainability.

However, local governments do not face the same dilemma. They only need to consider their region's growth, consumer benefits, traffic and the environment. Consumers can buy cars from all over the country and so car purchases do not necessarily help the local automobile industry directly. In this sense, local governments are less concerned about using policies to encourage automobile demand. This suggests that local governments are willing to have a laxer policy on new car licenses than is the central government. However, the reality does not seem to be fully consistent with this expectation for two reasons. First, car demand is an inevitable result of rapid increases in personal income. In highly developed regions and cities, the demand for cars is already very strong even without any favorable policies. Second, more cars is a symbol of the economic prosperity of a city, which helped to boost the local economy through more efficient services and production. Therefore, the highly unbalanced growth of the Chinese economy suggests that the central government needs to have various policies to encourage car demand in some areas and discourage car demand in some others. Nevertheless, the central government has a uniform policy for the whole country, which is to encourage car consumption by removing all restrictions on car consumption and sales (June 2004).

In order to control the number of motor vehicles within particular provinces, each provincial government issues a certain amount of licenses each year. In most regions, the price of each car license was about several thousand yuan in 2004. The price in Shanghai is much higher.

The Shanghai government began a car license plate auction in the mid 1980s to reduce traffic pressures by issuing a limited number of new car licenses each year. Initially, the auction used sealed bids and the price for the license was about a few hundred yuan, but then the price went up to as high as 100,000 yuan. However, the license fees for Shanghai-made cars were lower than those for other cars like Audis by about 80,000 yuan. The Shanghai government used this policy to restrict overall new car growth but at the same time to protect the local car industry.

In 2000, the Shanghai government announced a new car license plate policy. It had a floor-price auction policy before 2000 and in 2000 adopted a no base price format. Before 2000, the minimum price of the car license plate for a Santana model at auction was about 20,000 yuan (US\$2,410), while the minimum auction price of other car brands like Audi, Jetta and Honda Accord were about 98,000 yuan (US\$11,800). In 2001, it issued about 159,000 plates and the average price was 14,444 yuan. In 2002, the average price was 27,848 yuan while the issuance of new licenses was about 318,500 plates. The price exceeded 40,000 yuan in August 2003. In the recent four years, the Shanghai government issued about 1 million plates while the license price increased from 10,000 yuan to 40,000 yuan.

Although the new license control helps to relieve traffic problems and environmental concerns, it significantly affects demand for cars. For example, in 1996, the taxes and fees on car purchases were equal to one-third of a car's price on average. In 2002, the price of a Santana car ranged from 179,000 yuan to 265,000 yuan, but the auctioned license fee was about 20% of the car price. Furthermore, these controls seem to violate the new law announced by the central government. The central government has promulgated a new auto consumption policy, which states that no local government is allowed to auction car licenses. Shanghai has either been given an exception or is in violation of the new law. In addition, the central government has declared recently that the provinces should standardize the charges for auto usage and cancel some fees such as highway fees and transportation management fees.

It seems that the controls on new license registrations are not tight in big cities in China. For example, in 2002, Guangdong province reduced the restrictions imposed on private car license applications.

3.4. Bargaining Power of Suppliers: Parts and Components Producers

The automotive industry includes the final products (cars, trucks, etc.) and upstream intermediate goods (auto parts and components). Once we focus on automobiles, especially sedan production, the suppliers are producers of auto parts and components. Auto parts and components include many items such as seats, air conditioners, exhaust systems and shock absorbers, constant velocity joints, wheels, automobile glass, car braking systems, airbags and seatbelts, and tires.

In contrast to the automobile industry's development, the local parts and components industry stagnated over many years. From Table 2.1, we have seen that in the past 20 years of economic reforms, while the number of motor vehicle producers increased rapidly, the number of parts and components suppliers actually dropped, from 2,076 in 1980 to 1,540 in 2002. Most of these firms are small in scale. More importantly, the technology levels of auto parts and component suppliers are about 20 years behind the international standard. They can only produce low-quality products and lack the capital and personnel to conduct R&D to improve their product quality. As a result, local automakers have to rely on imported parts and components, especially for high-tech parts such as shock absorbers, car braking systems, airbags and seatbelts.

The government has realized the importance of the parts and components industry for developing a competitive local automobile industry. Since the 1980s, the government had imposed a local content requirement (LCR) regulation on FDI in the Chinese automobile industry. According to this regulation, foreign-invested enterprises (joint ventures) must achieve LCR target, i.e., use a certain percentage of parts and components in their cars from local parts and component suppliers. This is supposed to induce foreign automakers to transfer their technologies for parts and components production to China. However, this policy is not consistent with the WTO's national treatment principle and has been abandoned since 2002 after China's accession to the WTO.

Local parts and components suppliers in China have no bargaining power with automakers. First, there are too many parts and components producers and most of them are very small. Second, although there are also many (in fact too many) local carmakers in China, the industry is

dominated by only a few very large ones (see discussion in the next subsection). These large automakers are the major buyers of the local parts and components and their orders account for very large proportions of the local supplier's sales revenues. Third, many large domestic automakers have their own subsidiary component plants in order to maintain long-term relationships with the supplies and to ensure component quality.⁴ They are more willing to order parts and components internally rather than from outside companies. This vertical integration structure further weakens the bargaining power of local parts and components suppliers.

The following example illustrates the picture of the weak position of the local parts and component industry. Yuchai (玉柴) was a leading engine producer in China in the 1980s and early 1990s. It was initially a SOE, later it became a collectively owned enterprise, and it was eventually listed on stock exchange. It had the potential to become a dominant engine supplier in China. It developed almost from nothing in the early 1980s to its peak in 1995. Its market share in China's medium-duty truck engine market accelerated quickly from almost zero in the 1980s to about 49% in 1995 with about 450 million yuan net profit in that year. However, its success was short lived and it almost collapsed within a few years after 1995. One major problem was that the FAW and Dongfeng were Yuchai's main consumers in the beginning, but later on became its main competitors. Yuchai's great success in the early years and the resulting attractive profits aroused interest at FAW and Dongfeng to tap this market. Consequently, they established their own subsidiaries to develop diesel engines and started to switch their engine orders from Yuchai to their own subsidiaries after 1995.⁵

Automakers also purchase some raw materials directly from the market. These include plastic, metal and steel. But materials are mainly imported from overseas. Local automobile enterprises rely on imports and the prices of these products are affected by world demand and supply. It seems that local automakers do not have the advantage to bargain with overseas suppliers.

The components industry is growing in tandem with vehicle output growth in China. The tough local content rules and the imperative of the 'just-in-time' production approach also help this industry. One estimate is that the Chinese automotive components market will be worth US\$45 billion by the year 2005, the largest of any single country.

By 2004, 35 of the 50 largest auto component-producing companies in the world had set up joint ventures in China. In 1993, Delphi, the top global auto component supplier had just nine employees, two clients, and a sales volume US\$20 million in China. In 2003, Delphi's total sales revenue in China was US\$650 million and its employment rose to 8,000 people. And in 2003, another auto component world giant, Bosch of Germany, sold more than US\$1.2 billion worth of components in China.

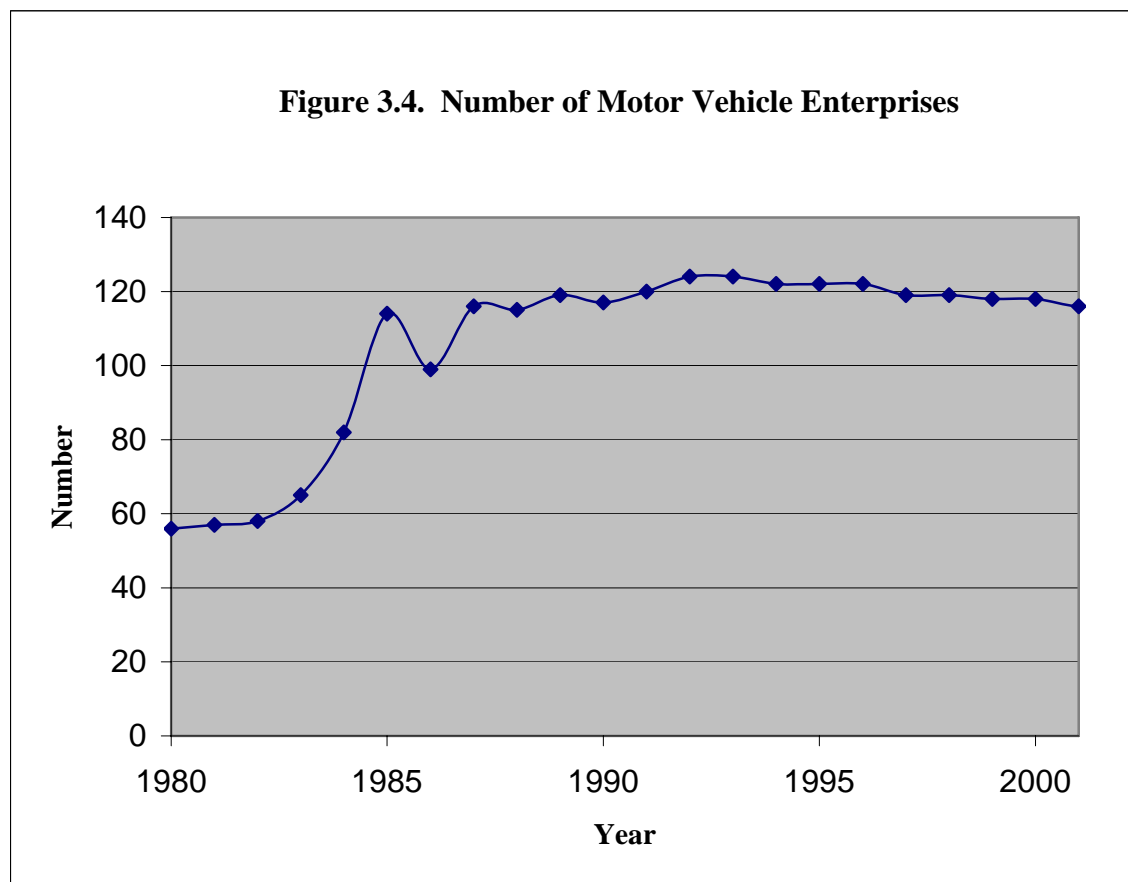
⁴ In Japan, Toyota, like some other automakers, has a business group that includes many parts and components suppliers. The business group is called a *keiretsu*, which helps to improve the efficiency and competitiveness of the Japanese automotive industry. See Spencer and Qiu (2001).

⁵ In recent years, Yuchai found a new market. It has become the largest internal combustion engine producer in China. And its expected sales in 2004 could be as high as 10 billion yuan.

The component industry in China has developed in a number of centers. For example, Toyota, Honda, Aisin Seiki of Japan, BASF of Germany and many other transnational enterprises have made investments in Foshan, a city in Guangdong. A dozen other foreign investors from Japan, Germany, Singapore and Switzerland are currently making their investments there.

3.5. Rivalry among Current Competitors

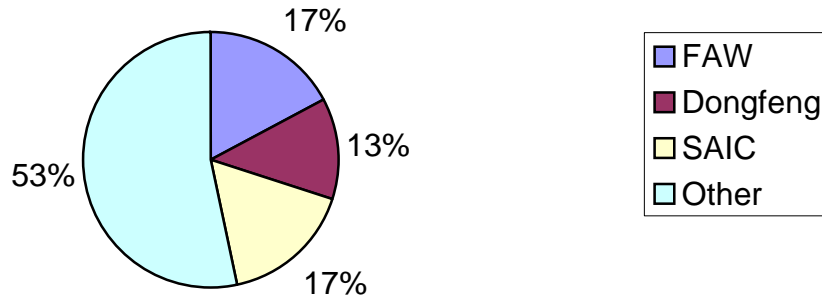
In 2002, there were 117 automakers in China. Thirty-one of them (27%) recorded losses in that year. The problem was not too bad, thanks to the robust demand in recent years. The market structure is characterized by a very large number of competitors and a very small number of dominant companies. Hence, the market is competitive and concentrated. Based on the data in Table 2.1, we depict the growth of the number of domestic automakers in Figure 3.4 below.



Source: *China Automotive Industry Yearbook*, 2003

Figure 3.5 indicates that FAW, SAIC and Dongfeng together accounted for 47% of total automobile production in 2002 (17% for FAW, 17% for SAIC and 13% for Dongfeng).

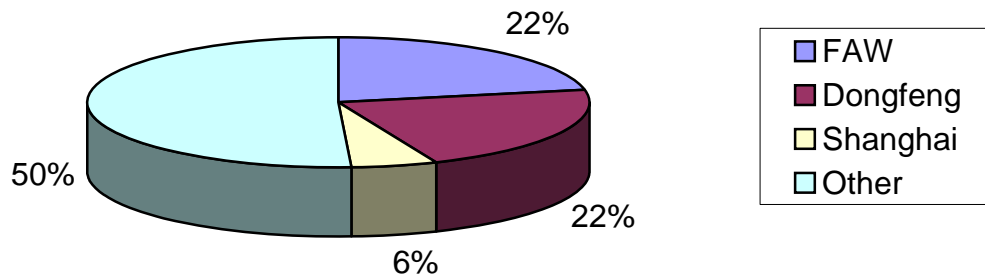
Fig. 3.5. Distribution of Total Motor Vehicles in Year 2002



Source: *China Automotive Industry Yearbook* (2003)

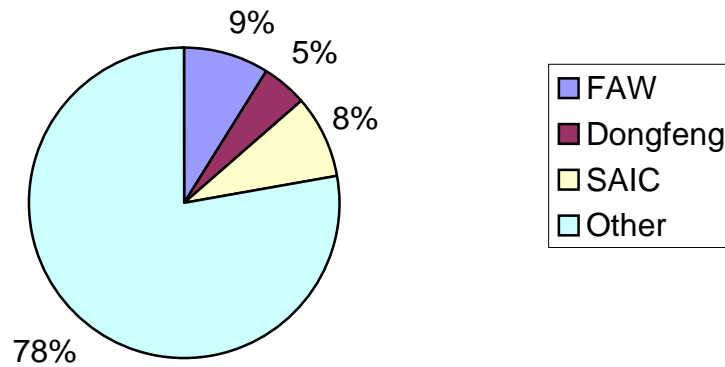
The three firms are called the Big Three in China's automobile industry. The three pie charts in Figures 3.6 – 3.8 show the market shares of the Big Three in the truck, bus and sedan markets, respectively, in 2002.

Fig. 3.6. Market Share of Truck Production in 2002



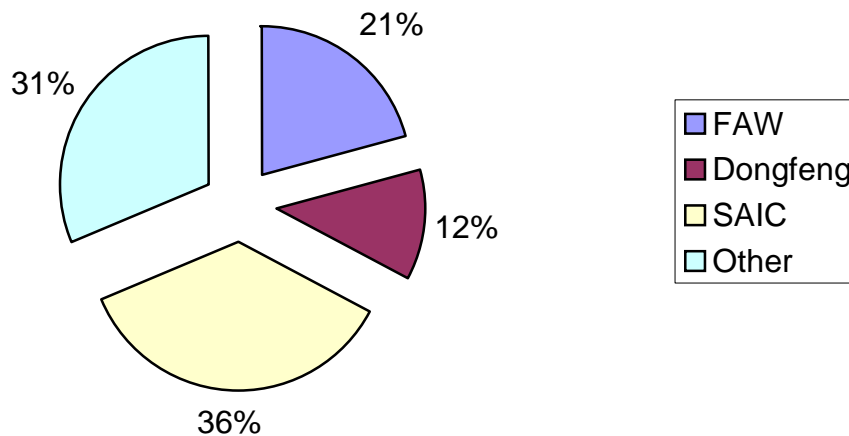
Source: *China Automotive Industry Yearbook*, 2003

Fig. 3.7. Market Share of Bus Production in 2002



Source: *China Automotive Industry Yearbook, 2003*

Fig. 3.8. Market Share of Sedan Production in 2002



Source: *China Automotive Industry Yearbook, 2003*

The market dominance of these three firms is most significant in the sedan market. While they jointly have 50% of the truck market and 22% of the bus market, in 2002, they control 69% of the sedan market. In particular, SAIC is the largest sedan producer in China and its market share in 2002 reached 36%. The total sedan production from 1990 to 2003 is given in Table 3.7. SAIC produced 390,513 sedans in 2002 and 612,666 sedans in 2003. It has a series of models including Santana 2000, Polo, Golf and Passat. FAW produced 226,439 sedans in 2002 and 519,865 sedans in 2003. Its models include Audi A4, Mazda 6, Red Flag, Golf, 绅雅 and 骏雅. (Dongfeng

produced 226,439 sedans in 2002 and 519,865 in 2003. Its models include 富康 (Citroen), 爱丽舍 (Elysee), 毕加索 (Picasso), and 赛纳 (Seine).

Table 3.7. Sedan Production in China (1990-2003)

	1990	1991	1992	1993	1994	1995	1996
Output	42,409	81,055	162,725	229,697	250,333	325,461	391,099
	1997	1998	1999	2000	2001	2002	2003
Output	487,695	507,861	566,105	612,376	703,521	1,103,258	2,018,875

Source: *China Automotive Industry Yearbook* (2003)

The Chinese automobile market can be divided into three categories. The high-end category mainly consists of imported luxury cars such Mercedes Benz, Volvo, BMW and Lexus. The medium category consists of both some imported cars, such as Camry and Corolla, and those produced by the Big Three, such as Audi and Jetta. And the low-end category consists of products from most other small local car assemblers. For example, Geely Automobile Holdings Ltd, based in Zhejiang Province, produces some of the cheapest cars in China (priced at as low as 40,000 yuan in 2003). Another example is the Chery (奇瑞) produced in Wuhu, Anhui Province.

Not all those automobile producers are competing in the same market. They are competing in three distinct markets, in fact mainly the medium and low-end markets. The three markets are quite fragmented: with very rich business people being the consumers in the high-end market; government agencies, companies and high-income families in the medium market, and middle income families and some people living in the counties and rural areas as consumers in the low-end market. Price competition between categories is not severe, but price competition within the same category is very fierce. As Liu (2001) illustrates, the dominant domestic firms set their prices 'neck-to-neck', meaning that they respond to their rivals' price changes quickly. In 1997, FAW reduced the price of its Jetta car by 1%. In response both Dongfeng and SAIC reduced their prices by 0.8% and 1.6% immediately. In fact, the average price of motorcars fell by 10% each year of 2002 and 2003. Indeed price competition is more intensive than this 10% drop in average price because the production costs increased in those years. For example, in 2003, most of prices of required raw materials for car production such as steel, plastic, metal and glass rose considerably. In particular, the price of steel increased by almost 50%. However, due to intensive competition, the price of automobiles did not increase, but moved in the opposite direction. This implies an adverse effect on the carmakers' profits.

Price competition has its limit. Firms cannot cut their prices below their production costs. Firms compete on many dimensions. In order to avoid price competition, enlarge the potential consumer pool and increase customer loyalty, many automakers introduced new car models in 2002. Beijing Automotive introduced the Jeep 2500 and Pajero Sport; Tianjin Automotive introduced Vios; FAW introduced a new Audi; SAIC introduced Regal 3.0 and Polo 1.6; and Dongfeng introduced Suny 2.0.

Another dimension of competition is capacity. For example, SAIC's foreign partner Volkswagen planned to inject 1.5 billion yuan to its joint venture Shanghai Volkswagen.

Dongfeng announced that the new Guangzhou Huadu Plant would have an annual productive capacity of 150,000 autos and produce Nissan brand automobiles. Having a larger production capability allows a firm to compete more aggressively in the market.

Local firms in the medium category not only compete among themselves, but also against foreign carmakers through imports. As China will fulfill its commitments made to the WTO, most trade and FDI restrictions will be removed. Competition pressure on local automakers will surely increase. Price competition, product differentiation, enhancement of sales and marketing activities are all expected to persist for the next few years. Only those companies that are competitive in their niche markets can survive. Increased competition and the market environment will force the industry to restructure through entries, exits and mergers and acquisitions. The structure of China's automotive industry is not stable and we can expect to see its drastic changed in the near future.

4. Beyond the Five Forces

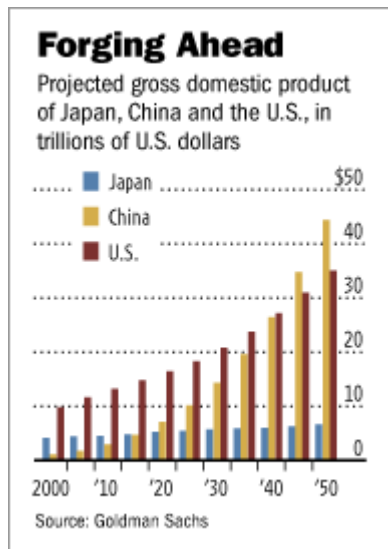
In this section, we discuss a number of issues that do not come under the five forces but are important in affecting industry profits.

The 1987 auto industry development plan promoted concentrations in the industrial structure to reach efficient scales and international standards. As a consequence, the number of sedan makers was restricted to six, designated as the "Big Three", including FAW (FAW-Volkswagen), Dongfeng (Dongfeng-Citroen), and SAIC (Shanghai-Volkswagen), and the "Little Three", including Guangzhou (Guangzhou Peugeot, which was dissolved and latter replaced by Guangzhou Honda), Beijing Jeep Corporation (Chrysler) and Tianjin Minibus Works (Daihatsu). Preferential treatment was granted to them. The "Big Three" formed the backbone of sedan production in China, while the "Little Three" were designated primarily to substitute for imports.

In the 10th Five-Year Plan (2001-2005), in order to increase production efficiency, the central government announced new directions for the industry. On June 1, 2004, the state government issued "Policies on the Automotive Industry". It pointed out clearly that the industry needs to be restructured: only two to three large automobile groups will exist and their supply should take more than 70% of domestic automobile market; 5 to 10 large supplier groups will be the major suppliers in the parts and components market. It also set limitations on registration of new investments. New motorcar and engine producers need to possess technological development ability and facilities and the initial capital investment cannot be less than 0.2 billion yuan. New specialized motorcar enterprises must have more than 2 billion yuan in registered capital and have R&D departments. The investment projects of motor vehicles producers in other car products must involve more than 1.5 billion yuan in capital, less than 50% in debt and AAA Bank Credit Rank.

One of the disadvantages of the local automobile producers is their backward technology. What is worse is that this technology gap between local producers and the world's large automakers has become wider. R&D expenditures of FAW, Dongfeng, SAIC and Tianjing Minibus Works is on average below 1% of the total sales revenue of the companies. In contrast, General Motor spends 4.8% of sales revenue on R&D; Ford spends 4.2%; Toyota spends 5%; and Honda spends 4.5%.

The macroeconomic environment is very important for the healthy growth of an industry. Economic growth is a crucial factor for automobile demand. The Central Intelligence Agency issued a report in December 2004 likening China's emergence and its impact on the world to that of the U.S. in the last century and Germany in the 19th century. The report says that by 2020 the world's geopolitical center of gravity will tilt toward Asia, especially China, the economy of which will have surpassed Japan's to become second only to that of the U.S.



The more optimistic predictions are not based solely on simple calculations of gross domestic product but take into account other factors. Factoring in future appreciation of in the Chinese currency, for example, makes the economy relatively larger. Another is purchasing-power parity, which adjusts currency conversion to measure the relative costs of goods and services. Using the PPP measurement, the World Bank ranks the Chinese economy as second only to that of the U.S., while in a straight dollar conversion, China is sixth--ahead of Italy and Canada. The Goldman Sachs analysis predicts that China will overtake the US as the largest economy in the world.⁶

A study has shown that the motorization rate in China has increased from 1.70 vehicles per 1,000 people in 1980 to 9.37 vehicles per 1,000 people in 1996. Some studies predict that China's motorization rate would grow to 54 vehicles per 1,000 people by 2020 (Riley, 2002). Undoubtedly, the demand for automobiles remains strong in the long run.

However, the sales and demand for motor vehicles is not so bright in 2004 and 2005. Firstly, the majority of accumulated demand for automobiles is already exhausted, reflected in the rapid growth of car sales in recent years. The growth in demand is likely to slow down. According to a recent report published by the Beijing Consumer Association, 74% of interviewees had bought family-use sedans between 2000 and 2003. As China is still a developing country, the purchasing power of local citizens is limited and a family is not likely to buy a second car in the short run.

Secondly, there is a strong positive correlation between the demand for cars and economic growth. Despite some rosy predictions by many business agents, China will not have as high a GDP growth as before because its priority is to maintain economic stability and achieve long-term sustainable growth. As a result, the growth of automobile demand may slow down.

Thirdly, China's entry to the WTO has resulted in lower import tariffs and removal of restrictions on imported foreign cars. It is predicted that prices of domestic motor vehicles will fall in the future. Many potential buyers who are not pressed to buy automobiles are now willing to postpone their consumption. For instance, the consumer report about family sedans in Beijing indicates that over 50% of interviewees plan to postpone their purchase until after 2005.

⁶ Charles Hutzler, "China may be on course to overtake the U.S. economy", *The Wall Street Journal*, January 24, 2005, page A2.

Fourthly, in spite of the increasing purchasing power of Chinese residents, many buyers still cannot pay the full cost of motor vehicles and have to rely on the installment purchase method. However, many loan default cases on automobile loans were reported in 2003, resulting in great losses to the insurance companies. Without insurance companies' involvement, banks are forced to reduce or even shut down the car loan business. Those banks who continue to do this kind of business have increased the first installment payment and have set a more restrictive checking procedure, resulting in fewer qualified consumers to apply for loans. Other factors such as rising oil prices and increasing costs of raw materials also have negative effects on the automobile market.

5. Foreign Competition and the WTO

Foreign competition deserves our special attention. In this section, we discuss both imports and FDI in China. In November 2001, the WTO adopted a resolution to accept China as a member. In December 2001, China officially became a WTO member. The major commitments that China has agreed to follow after its WTO accession are to liberalize the domestic automotive market in terms of reducing tariff and non-tariff barriers and allowing foreign entry. Here are some highlights.⁷

- Import duties on automobiles will decrease from the current 80% - 100% to 25% by 1 July 2006.
- Import duties on automobile components will decrease from the current 35% or so to an average of 10% by 1 July 2006.
- Automobile quotas will be abolished by 2005. In the interim, the base level quota will be US\$6 billion, and this level will grow by 15% annually until complete removal of the quota.
- Restrictions on trading rights (import and export) and on distribution (wholesaling, retailing, maintenance and repair, transportation) will be removed over three years.
- Non-bank foreign financial institutions will be permitted to provide automobile financing.
- Restrictions in production policies (type, category, model) on automobiles produced in joint ventures will be phased out within two years of accession.
- The compulsory formation of joint ventures in engine production will be abolished and wholly foreign ownership will be permitted.
- The value for automobile joint venture projects that is subject to approval will increase from the current US\$30 million to US\$150 million within two years of accession.

5.1. FDI

FDI is one international expansion strategy for MNEs. However, it has not been easy for foreign companies to enter the Chinese market via FDI. While it is possible to set up wholly foreign-owned enterprises in China, they are not allowed to sell their products in the domestic

⁷ Please refer to Holbig and Ash (2002) for more details.

market. However, the major objective of foreign auto firms is to enter the China market. Alternatively, they can choose to have joint ventures with a local partner. Under the FDI policy, the Chinese partner must own at least 50% of a joint venture. Shanghai Automobile Corporation and Volkswagen set up their joint venture called Shanghai-Volkswagen Automobile. In 1990, FAW and Volkswagen set up the FAW-Volkswagen Corporation. This largely explains why there is no wholly foreign-owned automobile company in China and why the biggest local firms have joint ventures with foreign partners to produce foreign models.

However, relaxing the regulation on FDI in the auto industry is likely to induce the foreign automakers to establish wholly owned subsidiaries in China. These foreign subsidiaries possess advanced technologies, management expertise and the most current models. Abolition of limitations on exports and distribution means that the foreign subsidiaries would expand production to reach efficiency levels and fully utilize the local cheap labor or other resources to minimize costs as their products can be sold both in domestic markets and exported to overseas markets. This equal footing makes it difficult for domestic automakers to compete.

In the automobile industry, to reach minimum efficiency scale based on international standards,⁸ a plant's production should be between 200,000 and 300,000 units per year for sedans, between 100,000 and 120,000 units per year for light trucks, and between 10,000 and 80,000 units per year for heavy trucks. In the USA, GM and Ford control 56% of the total car production. In Japan, the four biggest companies control 68% of total car production. In China, it is obvious that the amount of local production is far below efficient production levels and so the average costs are greater than those of foreign companies without considering other advantages of foreign companies.

5.2. Import Competition

To protect the local companies, China imposed high tariffs on imported cars. The tariffs were on average 150% in the early 1990s. As a result, the domestic car industry was insulated from international competition and had time to develop itself. In 1995, the import tariffs on private cars and vehicle parts were well over 100%. In 2000, import tariffs were between 80% and 100% on sedans. Even under high tariffs, the demand for imported private cars remained very strong. As Table 5.1 shows, the market share of imported sedans was only 3% of the total imports in 1981. It rose to 55% in 1991. It remained over 50% in recent years. The number of imported sedans increased by 115% from 2000 to 2001 and 51% from 2001 to 2002.

⁸ Holbig and Ash (2002).

Table 5.1. Amounts and Expenditures for Imported Motor Products in China

Year	Motor Vehicles (unit)				Parts and Components of Motor vehicles (US\$10,000)	Total expenditure for Imported Motor Products (US\$10,000)
	Sedans	Trucks	Other	Total		
1981	1,401 (3)	20,770 (50)	19,404 (47)	41,575 (100)	3,594	30,536
1991	54,009 (55)	18,578 (19)	25,867 (26)	98,454 (100)	58,263	165,992
1997	32,019 (65)	7,424 (15)	9,596 (20)	49,039 (100)	92,800	207,821
1998	18,016 (45)	4,373 (11)	17,827 (44)	40,216 (100)	80,492	205,789
1999	19,953 (57)	2,685 (8)	12,554 (36)	35,192 (100)	100,425	258,018
2000	21,620 51	3,085 (7)	17,998 (42)	42,703 (100)	211,281	404,750
2001	46,632 (65)	3,138 (5)	21,628 (30)	71,398 (100)	261,767	470,326
2002	70,329 (55)	6692 (5)	51,174 (40)	128,195 (100)	295,874	261,767

Remark: Figures within parentheses represent the market share of the product among imported motor vehicles.
Source: *China Automotive Industry Yearbook, 2003*

After China's accession to the WTO, import duties on automobiles have decreased and will further decrease, eventually down to 25% in 2006. The tariffs on parts and components will decrease to an average of 10% in 2006. Import quotas will be completely removed in 2005. Consequently, the amount of imports is expected to increase especially for high- and medium-quality private cars and the prices of imported cars and domestic cars are expected to drop.

Although some foreign cars and models have been produced within China by joint ventures, Chinese consumers still prefer imported cars. Some large local companies have built several brand models of sedans such as the Audi 100 and Jetta by FAW-Volkswagen, Citroen by Dongfeng-Citoren and Santana by Shanghai-Volkswagen. Many Chinese people still favor famous foreign cars such as Mercedes Benz, BMW, Volvo and Lexus. This preference is stronger as people have more income. There are other reasons for owning a foreign car. The price of a locally made car is 40% to 50 % more expensive than its international counterpart of a similar make. The locally made cars are 10% to 20% heavier and consume 10% to 30% more gas for transportation than do foreign cars.

6. Concluding Remarks

China developed its automotive industry under heavy protection before the economic reforms in 1979. Since the reforms, the domestic industry has undergone tremendous changes. In

the past 20 years, China developed its infant automotive industry through high protection against both imports and FDI. China has had to lower and remove its protection given to the domestic producers after its accession to the WTO. We will see more changes in the near future.

China's automotive industry has achieved great improvements. However, as the market competition becomes fiercer, in order to survive, local automakers need to undergo restructuring and reorganization to improve their competitiveness. In the technological field, domestic automobile enterprises should speed up and devote more resources to R&D. The next few years are critical times for the domestic automotive industry.

It is important for domestic firms in the automotive industry to form long-term strategies in order to improve market position. The central government has indicated the main direction for this industry, which is consolidation and reorganization. What should a large, medium or small local firm do in this market? What strategies should a foreign automaker such as Toyota follow in order to secure its market share in the growing Chinese market? How do we predict the evolution of the Chinese automotive industry for the next decade? We are looking for sensible solutions.

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