

## **China's WTO accession impacts on domestic automobile industry—a rudimental approach from the view of scale economy**

**Zhuo Chen\*, Pengyi Shi, Chenkai Ni, Yin Chen**

### **Abstract:**

As a result of successful domestic economic reforms combined with a fast-developing international market that is willing to purchase its labor-intense products, China's economy has grown approximately 10% per year over the past 28 years and the GDP per person has grown up to 10561RMB in 2004<sup>1</sup>. This remarkable development has made China the second largest beneficiary of direct foreign investment, behind only the US. China has by far the largest developing economy—more than 30% larger than Brazil's. China's ranking in the world economy is expected to continue improving in the coming decades [1].

Fueled by the favorable open environment for MNCs (multinational corporations) to invest in domestic manufacturers and the increasing income for urban residents, China's automobile industry is likewise experiencing the fastest growth in its history. The total output (including saloon cars, camions and other special types) increased from 1475 thousand in 1996 to 5700 thousand in 2005, and the automobile possession rate per person increased from 0.2364% in 1996 to 1.1364% in 2004. On November 15, 1999, US and Chinese officials reached a bilateral agreement on China's bid for membership in the World Trade Organization (WTO) [2]. Upon its admission to the WTO in 2001, China agreed to make several major reforms (including the Tariff Reduction Schedule and the Ration Abrogation Schedule) that will bring about great impacts on China's automobile industry.

Much research has focused on the potential damage to domestic automobile producers when they have to compete with foreign magnates, some has given recommendations for China's less developed automobile industry to meet the challenges, and others even claims that China's inchoate automobile industry will not survive. But little has been written from the perspective of benefits, specifically the opportunities for the producers to enhance the manufactural technology and benefit from scale economy. This article attempts to fill this gap, offer evidence and data to prove that the expectation of potential competition when China is involved in WTO forces the automobile manufacturers to pursue industrial concentration, which will lead to scale economy and decrease the average cost in China's automobile industry. This trend will ultimately narrow the price gap between domestic market and world market and the total social welfare will increase.

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<sup>1</sup> Addenda Table A.1

*Keywords:* World trade organization (WTO); Automobile industry; China; Scale economy

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### **1. Introduction:**

China's economy has grown approximately 10% per year over the past 18 years. During this same period one of China's pillar industries, automobiles, has experienced the fastest growth in its history. In fact, China is becoming one of the world's fastest growing markets for automobile manufactures and services. According to a study by Pieter Bottelier on the impact of World Trade Organization (WTO) membership on China's domestic economy [2], China currently has the largest market for automobiles. The total output (including saloon cars, camions and other special types) increased from 1475 thousand in 1996 to 5700 thousand in 2005, and the automobile possession rate per person increased from 0.2364% in 1996 to 1.1364% in 2004.

The Sino-US agreement signed in 1999 paved the way for China's successful entry into the WTO, which will further accelerate China's economic development and as a result create huge demand for auto products and services. In this bilateral accord, the Chinese government made a significant concession by agreeing to open China's automobile market to the outside world. Upon its admission to the WTO in 2001, China agreed to make several major reforms (including the Tariff Reduction Schedule and the Ration Abrogation Schedule) that will bring about great impacts on China's automobile industry. For example, China will reduce the import tariff ratio from the current 22.1% to 17%, and correspondingly the tariff will be also reduced from the current 80%-100% to 25% by 2006. And all the quotas will be eliminated and foreign enterprises can import and export their products without agents. This agreement phases out many restrictions on foreign investment in this sector and offers tremendous business opportunities for foreign companies in China's vast auto market.

International auto manufactures, encouraged by the Chinese government's promise, have spent considerable time and money trying to determine the best way into this last and largest potential auto market. The amount of foreign investment in the manufacture of automobiles in China is already significant. For example, large US and international manufacturing companies, such as GE, Ford, Toyota, and Honda, currently invest heavily in China. Such foreign investment will continue to grow as China pursues its desire to become an important export base for a wide range of auto products. Increased foreign investment will undoubtedly bring Western management and production expertise to China's automobiles industry, thus great competition and challenges to domestic auto enterprises.

Many researches has focused on the potential damage to domestic automobile producers when they have to compete with foreign magnates, some has given recommendations for China's less developed automobile industry to meet the challenges, and others even claims that China's inchoate automobile industry will not survive. But little has been written from the perspective of benefits, specifically the opportunities for the producers to enhance the producing technology and benefit from scale economy. This article is written from the perspective of China auto

manufactures. It is organized as follows. First, it introduces the situation of China's auto market and analyzes the challenges manufactures could face after China joined the WTO. Second, it makes scale economy analysis based on empirical data in order to show the tremendous opportunities available to domestic enterprises. Third, it gives some recommendations to these enterprises based on China's current situation.

## **2. Overview of China's automobile industry**

### *2.1 Quick development before joining in WTO*

Propelled by economic reforms at home and an increasing interest of foreign capital to invest in domestic manufacturers, China's automobile industry developed quickly from 1980 to 2001 before China was affiliated to WTO (see Fig 2.1). During that time, the automobile industry had experienced an all-around development and the development was especially dramatic in the 1990s. Due to the increasing income for urban residents the possession rate per person also increased dramatically<sup>2</sup>. In that period, the development of China's automobile industry had such characteristics:

- i The total output increased continually, as figure 2.1 shows.
- ii The structure of products trended rationally.
- iii The organization and structure of automobile industry has been adjusted, the producing scale has aggrandized in some extent.
- iv Government increased the investment in the automobile industry continually.

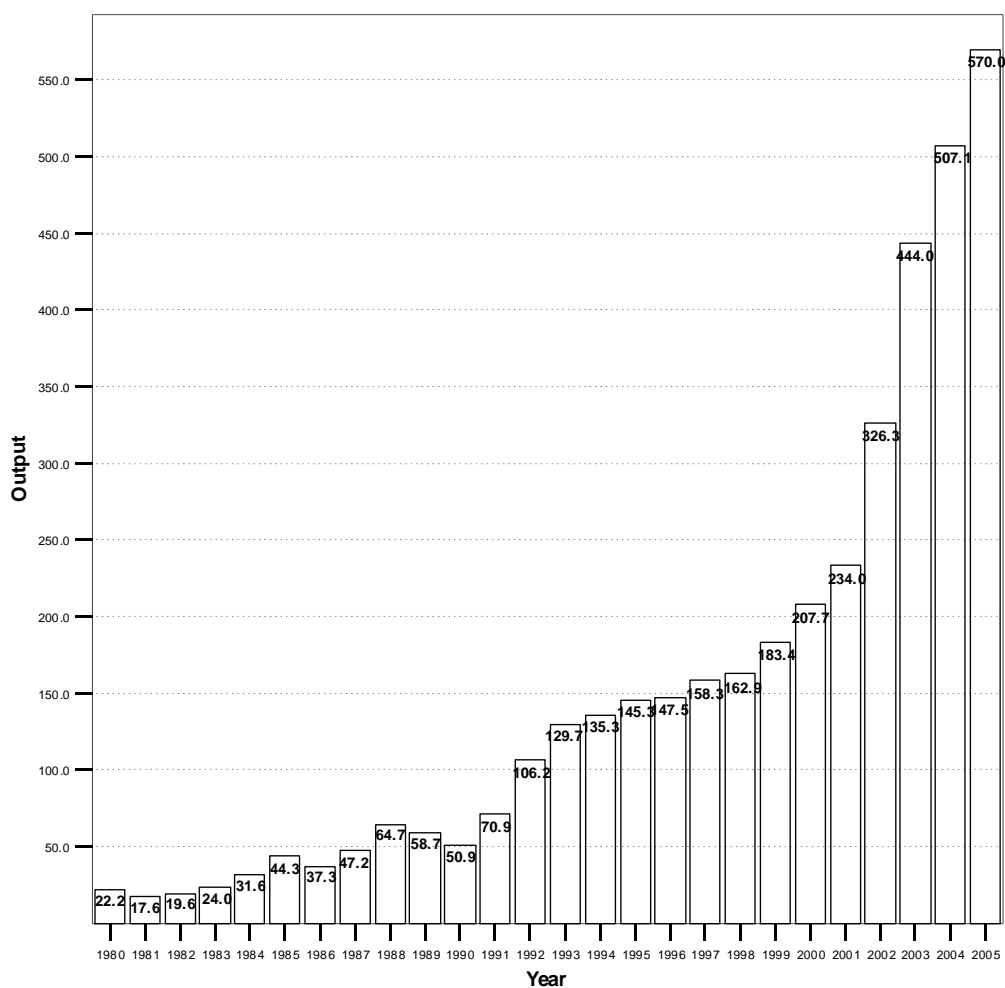
### *2.2 Booming development after joining in WTO*

Contrary to most people's pessimistic expectations about its performance after joining in WTO, China's automobile industry experienced a booming period during 2002 to 2005. Figure 2.1 shows the dramatic increase of output from 2002 to 2005, the average development rate is 24.9%. In 2002, the first year after joining in WTO, China's automobile manufacturers produced 3263 thousand, increasing 37% compared to 2001; and then in 2003, the output was 4440, increasing 34% compared to 2002; moreover, at the same time, the output of saloon cars respectively increased 56% and 75%. By 2003, China had become the fourth largest automobile producing country, and almost every automobile MNC had come into China by the means of joint venture.

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<sup>2</sup>Addenda Table 2.1

**Fig 2.1 Total output of automobiles 1980-2005 (Unit: 10 Thousand)**

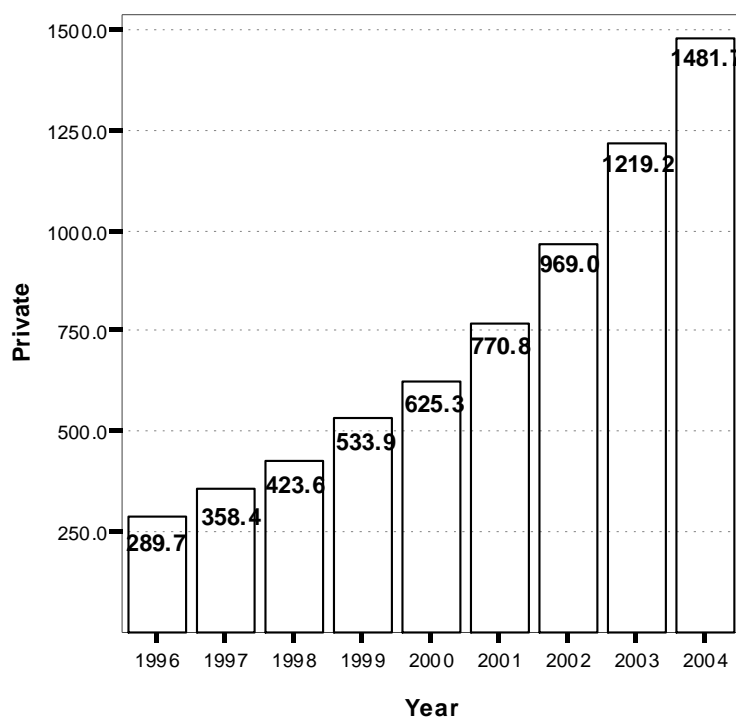


Source: China Industry Report 2005

The most important reason for this booming is China's commitment about the reduction of tariff and non-tariff barriers, especially the quota. Manufacturers have to expand the output in order to get scale economy since automobile industry is a typically scale economy industry which need organization concentration. In the next part of the paper, we will put emphasis on the analysis of scale economy in China's automobile industry. And furthermore, due to kinds of expectation, domestic producers launched price wars and new-products stratagem in order to take possession of the market as much as possible before China's joining in WTO. In 2002 and 2003 the price of saloon cars decreased 20% to 30% as a whole, in the year 2003 thirty new models came into market. Another reason for this boom comes from the demand aspect. The increasing income of urban residents motivated private purchase of cars. Generally speaking, when the GDP per person of one country reaches 1000 dollars, this country will meet a booming increase in the demand of automobile. As the addenda A.1 shows the GDP per person in 2002 was 8214RMB, thus it was normal

for China's increasing demand for automobile from that year. Fig 2.2 shows the number of private automobiles from 1996 to 2004, from this figure we will see that this number increased most in the year 2003 and 2004.

**Fig 2.2 Private possession of Automobiles 1996-2004**



Source: China Industry Report 2005

### 2.3 Competitive pressure

Although it continues to grow, China's automobile industry faces ongoing challenges from trends in global economic integration and automobile market internationalization. With the signing of the Sino-US bilateral agreement in 1999, China's admission to the WTO in 2001 and the entry of foreign automobiles with no quota and a maximal tariff of 25% into the Chinese market was only a question of time. Based on the agreement of the Tariff Reduction Schedule<sup>3</sup>, China commits to reduce the tariff on automobiles in a large extent. The tariff of automobiles with discharge volume under 3 liters will fall from 80% in 2001 to 25 on Jul 1, 2006. Furthermore, after joining in the WTO, China government will abrogate the quota institution with a time table. The initial quota is 6 billion dollars in 2000, and increasing 15% each year until wholly abrogating the quota within 3 three years joining in WTO (Actually China canceled quota in Jan, 2006). Much research claimed that China's automobile enterprises would face not only domestic competitors but must also pay attention to international markets and competitors. The industry would need to resolve problems at home: an immature market system, low operational efficiency, poor operational management, small

<sup>3</sup>Addenda Table 2.2

economic scale and less innovative achievements. At the same time, it must make massive adjustments to meet the challenges of its admission into the WTO. Some of these challenges are:

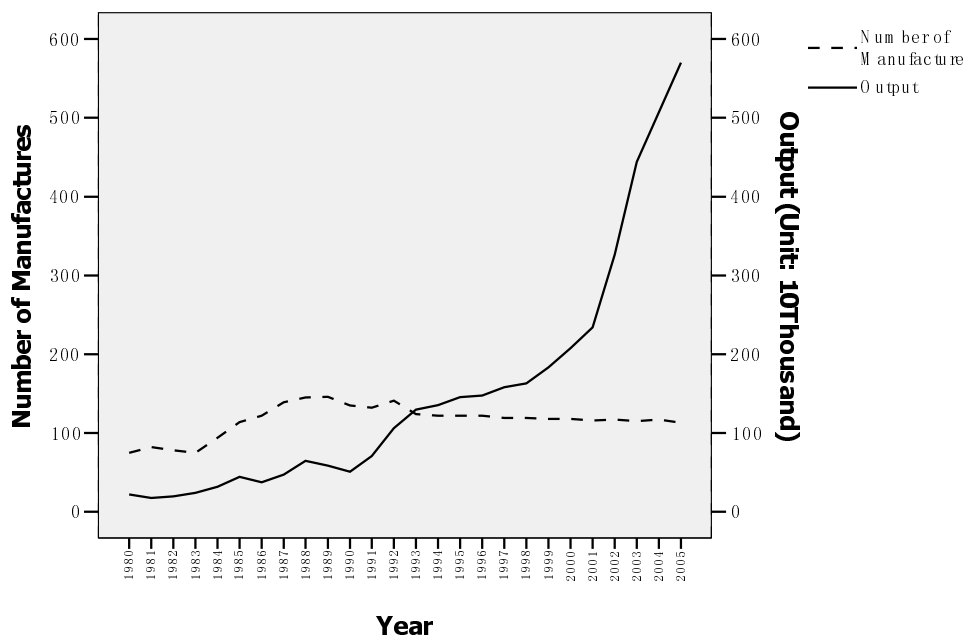
- i Though the tariff has been decreased to 25% and quota has been abrogated, China's automobile industry is still under the protect of some industrial policies, whether it could survive after several years joining in WTO when foreign products flow into China is uncertain.
- ii The area of automobile service in China is developing much slower than the automobile production, since China commits to open the distribution of automobiles to foreign corporations, they could directly engage in the import and export of automobile and correlative products without a domestic agent, and they can also engage in the whole service area, including wholesale-retail, after service, maintenance and transportation.
- iii At present foreign capital has controlled the process of R&D in the joint-stock automobile manufacture corporations; it is now engaging in the process of stocking system; then its aim is the distribution systems. If this happened, all the processes of the producing circle will be controlled by foreign capital and this will undoubtedly damage the benefits of China's domestic capital.

The boom of automobile industry in China and the pressure faced by China's domestic automobile manufacturers after China's entry into WTO coexist at present and we believe that this coexistence will last for a long period in future. The total benefit and cost of such situation are uncertain in short term while in long term the social welfare will increase. In the next part of our paper, we will emphasize on the scale economy brought about by the entry of WTO for China's automobile manufacturers and summarize some general conclusions.

### **3. Scale economy analysis based on some empirical data**

#### *3.1 Contrast between the number of manufacturers and the total output*

Automobile industry is a typical increasing scale economy industry, thus it is necessary for corporations to concentrate highly. However, before China entered WTO China's automobile industry was under protection for a long time, high tariff policy efficiently prevented international competition and thus the price was very high. High profit motivated local governments all around the country to make automobile industry the most important industry in regional economies and many automobile manufacturing projects had been established. Fig 3.1 shows the number of automobile manufacturers and the total output from 1980 to 2005.

**Fig 3.1 Number of Manufacturers and Total Output**

Source: China Industry Report 2006

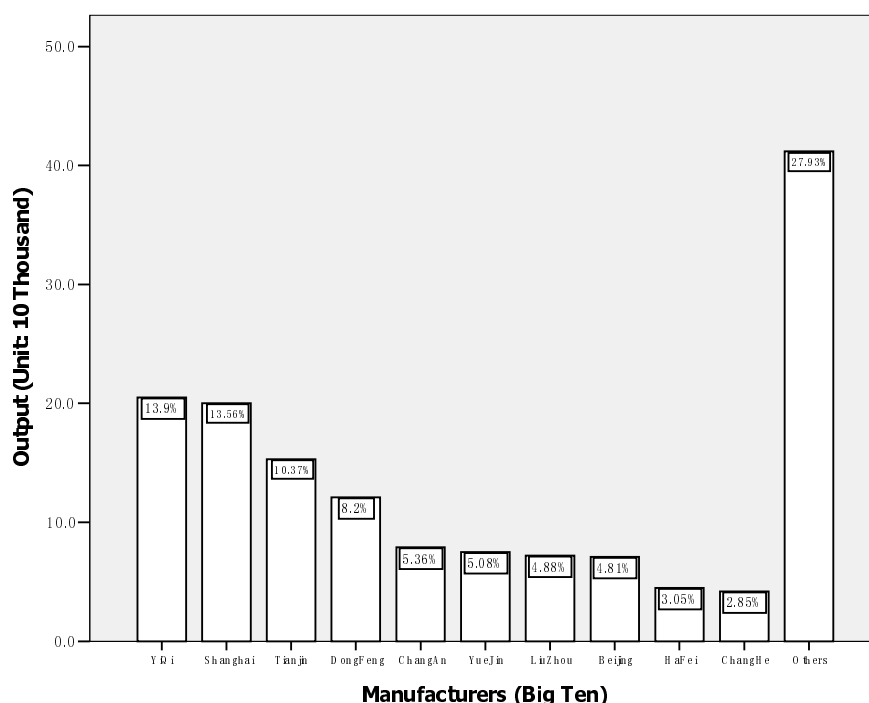
From this figure we can divide that time into three periods. The first period is from 1980 to 1989, during this period the number of automobile manufacturers increased quickly and attained the peak of 146 in the year 1989. However, the total output did not increase continually and quickly compared to the number of manufacturers, there were even three year 1981, 1986 and 1989 when the automobile industry experiencing decline. It is true that during this period the output had increased, however, since we can see that the increase of output was coincident with the increase of number of manufacturers, this increase can be judged as extensive development, not the increase of industry concentration, let along scale economy. The second period is from 1990 to 2001, when China experienced a booming development in most aspects of its economy. And this period is also the period when China was making attempt to rejoin WTO and ultimately made commitment with members of WTO. From the figure we can see that during this period the number of manufacturers decreased a little, from the peak at 141 in 1992 to the nadir 116 in 2001 and the output increased smoothly with the average increasing rate 9.2%. Because of the increase in output but the decrease in the number of manufacturers, we can get a general conclusion that the automobile manufacture in China began to concentrate during this period. The third period is from 2001 to present, when China began to fulfill the commitment on the tariff-reduction and quota-abrogation on the automobiles. We can see that in this period the number of automobile manufacturers almost kept the same while the total output increased remarkably. To explain this phenomenon we can assume that the

expectation of the potential competition with foreign manufacturers forced the domestic manufacturers to carry out industry concentration, some big automobile manufacturers annexed small ones, others even annexed stock suppliers, transportation corporations and distribution systems; on the other hand, small manufacturers had to combine with other small ones, or others might not survive and ultimately went bankrupt. Through this way, the automobile industry began the process of concentration which will lead to scale economy and lower cost.

### 3.2 Degree of industry concentration analysis

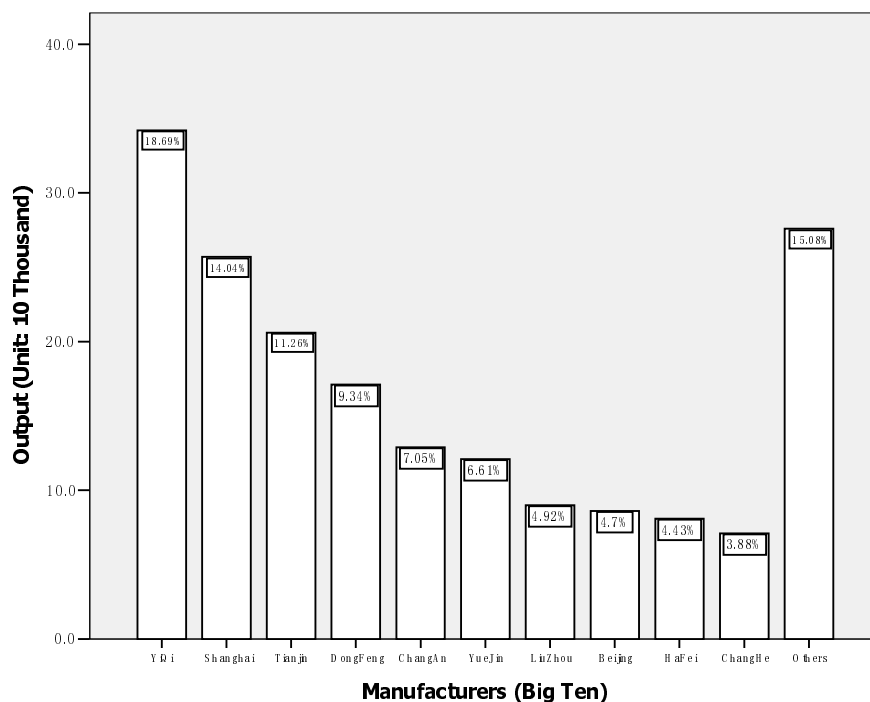
To further demonstrate the process of industry concentration, we provide Fig 3.2, Fig3.3 and Fig 3.4 respectively show the biggest ten automobile manufacturers in China in the year 1996, 2000 and 2004.

**Fig 3.2 Percent of Output by Big Ten 1996**



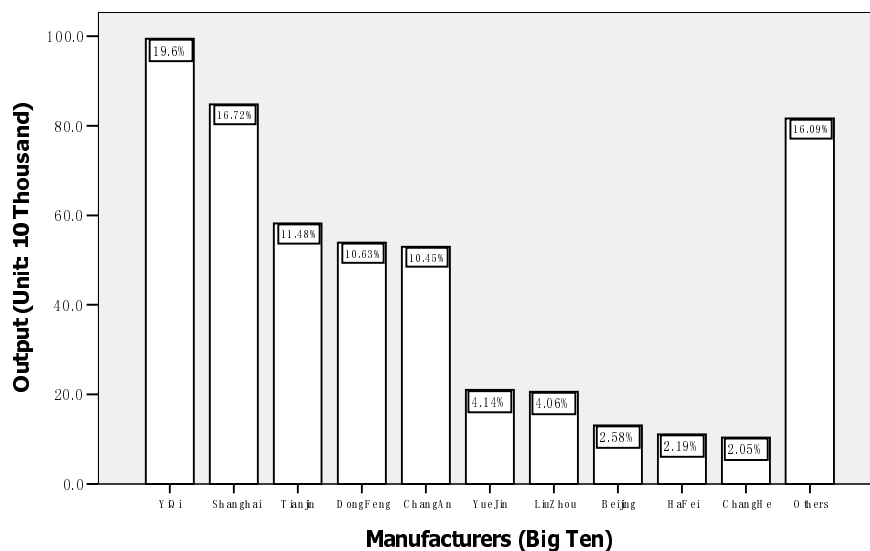
Source : China Industry Report 1997

**Fig 3.3 Percent of Output by Big Ten 2000**



Source: China Industry Report 2001

**Fig 3.4 Percent of Output by Big Ten 2004**

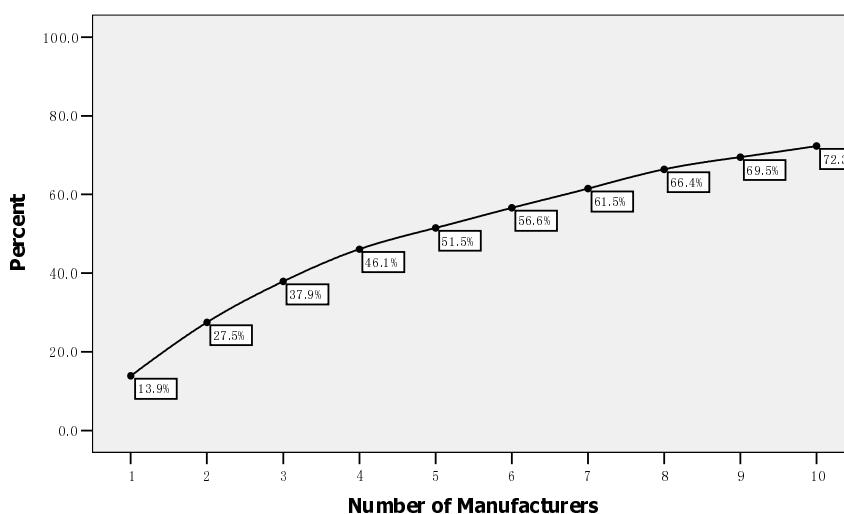


Source: China Industry Report 2005

From Fig 3.2, we can see that YiQi was the biggest automobile producer in 1996, it produced 205 thousand and account for 13.9% of the total output that year. In that year the biggest ten manufacturers produced 72.3%. In the year 2000 and 2004, the

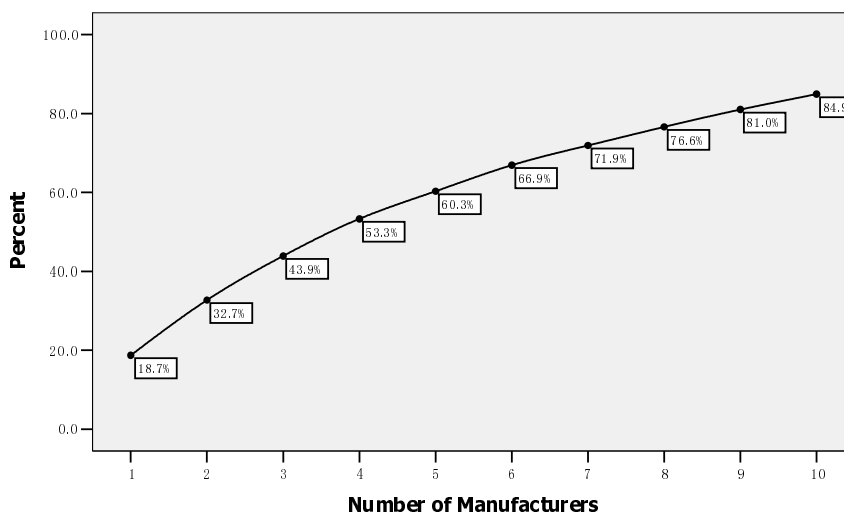
biggest manufacturer was still YiQi, and it constituted 18.67% and 19.6% of the total output while the Big Ten account for 84.89% and 84% of the total output. It seems that the industry concentration kept the same from year 2000 to year 2004 since the total percent of output produced by the Big Ten was almost the same. However, when we calculate the Big Five, we will see that the percent of products increased from 60.31% to 68.9%, which means the industry concentration continued after China had joined in WTO. This trend can be clearly seen in the industry concentration curve Fig 3.5, Fig 3.6 and Fig 3.7, each respectively represents the degree of industry concentration in the given year 1996, 2000 and 2004.

**Fig 3.5 Industry Concentration Curve 1996**

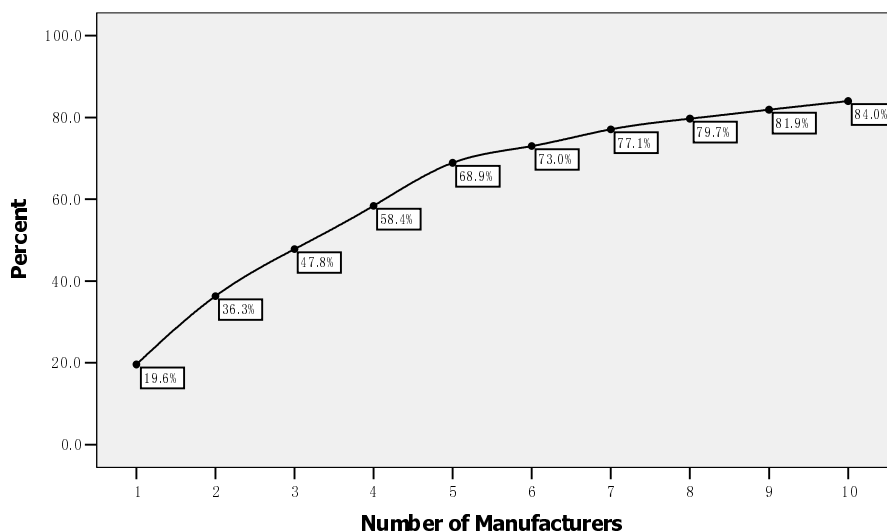


Source : China Industry Report 1997

**Fig 3.6 Industry Concentration Curve 2000**



Source : China Industry Report 2001

**Fig 3.7 Industry Concentration Curve 2004**

Source: China Industry Report 2005

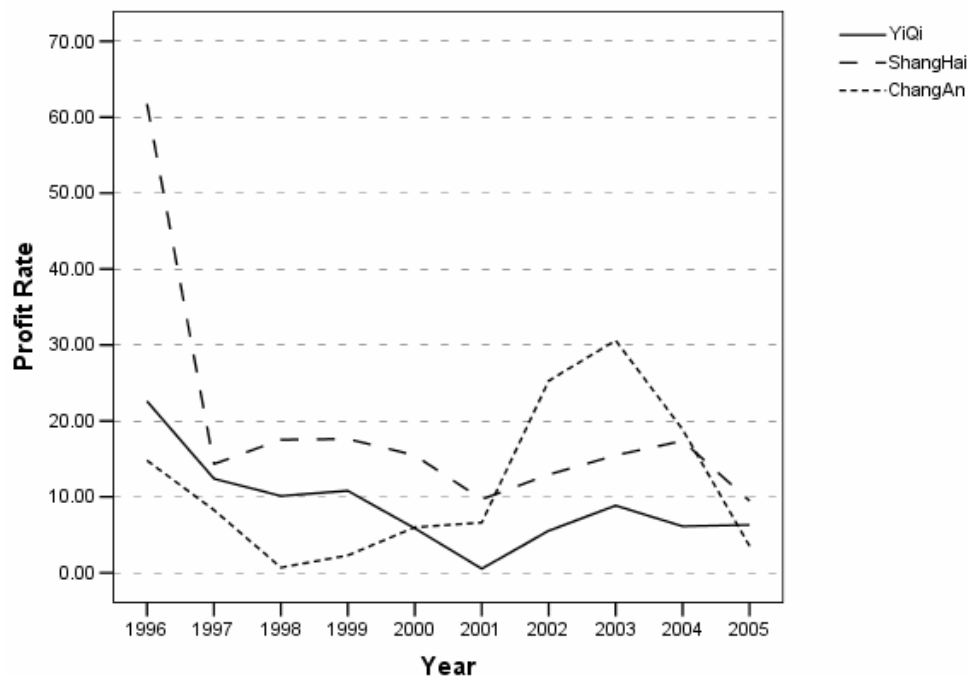
### 3.3 Profit analysis

Since the total price index is difficult to collect, we use an indirect method to analyze the price trend due to the impact of China's entry into WTO. We collect the profit rate from 1996 to 2005 of the largest three automobile manufacturers as representative. These Big Three incorporate most small corporations and thus gain most through scale economy. Furthermore, they produce most automobiles of the domestic output and their price can be seen as the index of the total price in domestic market. We assume that the cost of the Big Three decreases due to scale economy, because the price equates to the cost plus the profit, if the profit decreases, we get our conclusion that the price index decreases.

Fig 3.8 shows the profit rates of the Big Three (including YiQi, Shanghai and ChangAn) manufacturers from 1996 to 2005. This figure indicates that the profit rates kept decreasing although in 2002 and 2003 they experienced an increase, while this increase can be explained of the drastic increase of the demand aspect. We consider two reasons caused this decrease of profit rates. First, the industry concentration in the automobile industry analyzed above results in scale economy and thus the survived manufacturers are able and willing to reduce price to adapt the potential shock by the foreign automobiles inflow. Second, the reduced tariff and increased quota after China's entry into WTO enable foreign automobile manufacturers to compete directly with domestic producers, which ultimately forces domestic producers to cut down the price. Fig 3.9 shows the total import sum and total sale of automobiles in China from year 1996 to 2004. In the year 2003 and 2004, when the tariff was reduced to 38.2% and 34.2% from 43.8% in the year 2002, and the quota was almost canceled, the percent that import sum of automobiles accounted for was 23.7% and 25.2% of the total sale. This coincidence between the price decrease and import increase indicates

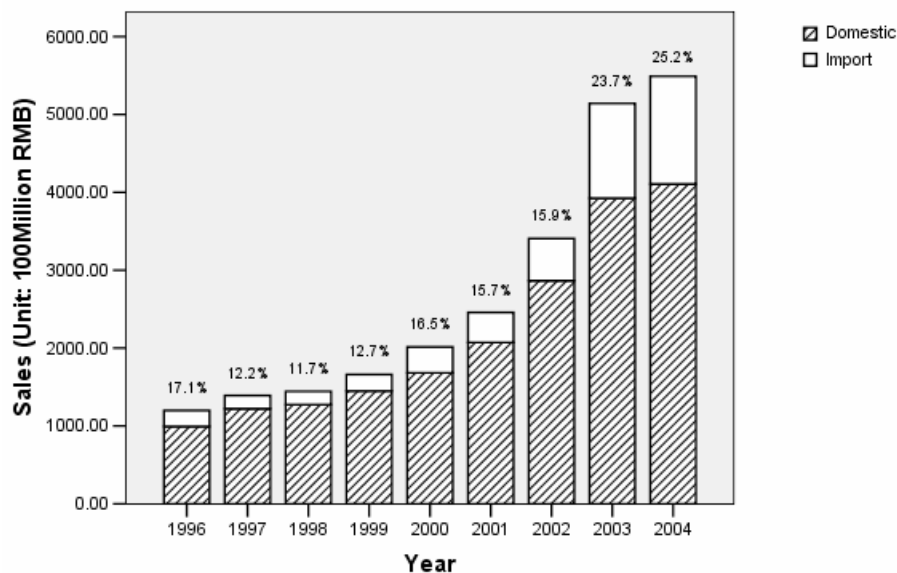
that the competition with the foreign products enforces domestic automobile manufacturers to cut the price.

**Fig 3.8 Profit rate of the largest three manufacturers 1996-2005**



Source: <http://stock.finance.qq.com/cgi-bin/info/nianbao>

**Fig 3.9 Sales of import automobiles and domestic automobiles**



Source: China Industry Report 2006

#### 4. Suggestions for domestic automobile manufacturers

Based on our analysis above, we can draw a general conclusion that although the automobile industry in China has experienced a booming period and with the impact of entry in WTO the manufacturers have done a lot to gain scale economy to survive,

the total profit rate drops and the gap between domestic manufacturers and foreign MNCs is still wide. In this part we will provide some suggestions for China automobile producers and policy makers to confront the challenges in future.

#### *4.1 Establishing well-developed sale and service networks in order to improve competitiveness by high quality services.*

Chinese know better about China's culture than foreigners and thus can more easily capture consumers' attentions. Moreover many Chinese manufactures have already built some networks and have advantages on domestic services. Maybe we cannot exceed foreign enterprises in the technology aspect in a short time; however, we can offer better service to occupy the market, since the ones who know their consumers better can attract more consumption. The TV industry is a good example: the domestic enterprises succeed in processing large share of market by low prices and high quality after services.

##### I. Enlarging the sale channels and accelerate the establishment of service network

The domestic auto manufactures should pay more attentions on the construction of sale channel and service network. They can enlarge the both of the scale and input efforts of the construction based on the existing channels and networks, and build a complete system consisted of "car sale-accessory supply-after service-information feedback". It has been emphasized by many experts that only though abundant accessory choices and convenient repair services can domestic enterprises be competitive in the auto market.

##### II. Developing credit consumption system for automobile

The auto financial business is compared as catalyst of auto industry and in foreign market this catalyst has been utilized completely. The auto credits in foreign countries are mainly supplied by sub-companies of the auto enterprises. For instance, 36% of the profits of GE and Ford are acquired by their own credit companies. However, the auto credit conception is still new in China and no well-developed system has been established. Based on data obtained by GE, the percentage of auto sale by financing in the U.S is 80%-85%, 71% in Germany, 60%-70% in India and 50%-60% in the province of Taiwan, but only 5% in the mainland. Hence our government should give political support to the auto credit to encourage the cooperation between auto enterprises and banks, so as to explore the big potential market of credit consumption.

#### *4.2 Cooperating in R&D between enterprises through various forms*

##### I. Establishing R&D cooperation by means of joint-stock.

The scale of domestic auto-enterprises is limited, but the amount of money needed for R&D in auto industry is tremendous. Therefore it is neither practical nor economical for a single company to carry out R&D. Especially for some significant technological development the form of joint-stock cooperation should be considered, which can be consist of enterprises, universities and national scientific institutions, etc. In the auto industry, the amount of automotive technicians in our country is large, 1.2 and 3 times to that of Japan and Korea respectively; while the amount of engineers and scientist related to auto is also giant, 3.8 and 11.6 times to that of Japan and Korea

respectively. However, the key point is how to combine all the scientific forces as a union. It is suggested that the state government should organize these forces and give financial support to some basic research, which can be obtained from the tax revenues of auto industry. Based on current situation, the development of enterprises, both in the technology and quality, cannot keep pace with the international auto industry only through the accumulation of profits.

## II. Capturing the opportunity of developing new technology to make breakthrough in single aspect

The rapid development of new technology in auto industry is a challenge to the domestic manufactures, at the meantime an opportunity. In some existing tech realm, we may fall behind the developed countries as many as 20-30 years; however, in some newly emerged realm, we may only fall behind 3-4 years, or even start at the same time. This make available we keep pace with and transcend foreign companies as long as we can predict the future developing trends and focus our force to some certain points. Take the R&D in electricity-powered auto for example. The gap between domestic and foreign enterprises, in the level of both technology and industrial intensity, is comparatively small. We have already succeed in excogitating electronic auto samples, electronic conception car and bus powered by fuel battery. Characterized as environment protection, electronic-powered auto make available the opportunity for us to reach the advanced level.

## III. Effectively utilizing the technological resources of foreign countries

We should also break conception restricts in the R&D of developing new products and immense ourselves in the globalization of auto industry. We can make use of the advanced scientific resources in foreign countries and obtain the technology through collaboration R&D or commission to foreign companies.

### *4.3 The low-end cars strategy*

The domestic auto enterprises should occupy the market of mini type cars and agro-autos when competing with foreign companies on the medium and top-grade market. In the past decade, the development of medium and top-grade auto in China is quite slow; however, motorcycle, subcompact cars, agro-autos and light-duty cars surge rapidly. It is mainly because the limit of consumption in China: the rich need foreign limousines to show off while the ordinary purchaser cannot afford the buying and maintenance charges for medium and top-grade cars. Moreover the transportation condition in China is far behind that of foreign countries, which renders most of the roads and highways not suitable for medium and top-grade autos to drive. Therefore, jeep, minibus, and subcompact cars are major choices for local citizens. The domestic enterprises should take advantage of this situation in China and thus occupy this market with a great amount of potential consumers. And it is also suggested that the government should make policies to encourage domestic manufactures to purchase companies of subcompact cars, minibus and agro-autos, help them to introduce in advanced technology and management, and finally enter the international market. Furthermore, the low-end auto enterprises should also improve the industrial intensity and reduce overproduction and repetition.

#### *4.4 Paying attention to the development of automobile accessories*

To improve the technology, quality and international competitiveness, the auto accessories industry should precede. In long term the production and quality of auto accessories have severely restricted the development of China's auto industry. In 1994 the total investment in domestic auto industry is 198.8 hundred million RMB. 96.2 hundred million RMB is invested for the main part and only 58.9 hundred million RMB for the accessories. It is undercapitalized in the accessory industry for the ideal ratio is 1:1. Nowadays, with the increasing use of electronic parts, electro-jet, ABS and GIS form a big market in which demand exceeds supply. This is a challenge and opportunity for domestic auto accessory industry. The government should guide and support the scatter forces in production of significant accessories to recombine and develop into volume-production and specification. It is also necessary to limit foreign capital inflow in these accessory enterprises to certain degree by means of macro-economical control. The government should provide financial support to the accessory enterprises to establish technology research center and information collecting center in order to trace the latest trends of key parts.

#### *4.5 Establishing the auto tax system by legislation and make policy to encourage consumption*

The advantages of scale economy can be revealed through activating auto consumption and expanding the auto market. So it is necessary to encourage private purchase and car using in order to enlarge the market demand and thus support the development of auto industry. The government should make policy to encourage car purchase and reduce the tax burden when buying and using, thus change the current condition that consumers cannot afford the maintenance fees instead of the purchase charge. Moreover, the reform plan of fuel tax should also be popularized. It is helpful to reduce consumer's burden and encourage the use of environment-protection cars.

#### *4.6 Using the tariff protection flexibly and antidumping when necessary*

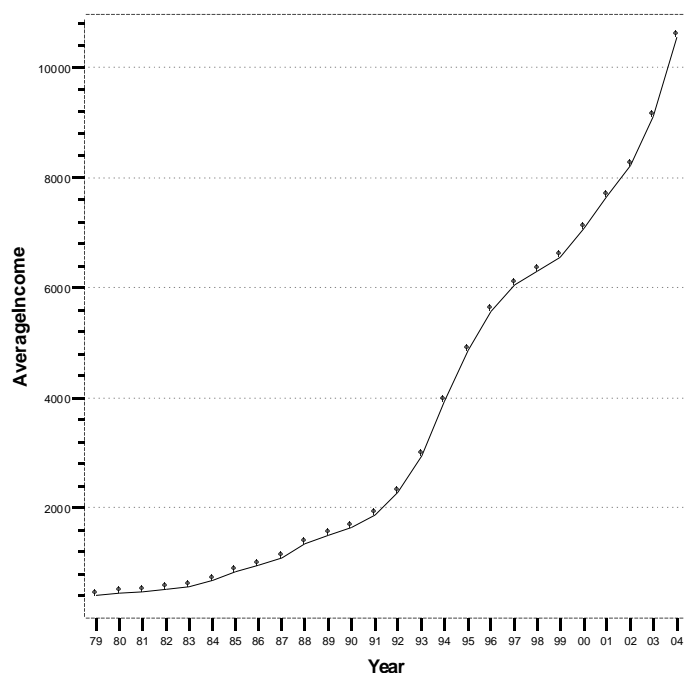
The committed tariff reduction is average level when entering WTO, thus the government can set up differentiate tariff level according to competitiveness. For those competitive product and accessory we can set a lower tariff while for those not so competitive ones we can set a higher tariff. The tariff level should also be adjust according to different types of car. For the low-end autos, which have certain competitiveness as we discussed above, a lower tariff ratio can be set; for the medium and top-grade the ratio should be higher. The antidumping mechanism should also be established in order to offer protection to domestic auto industry when confronting big impacts.

### **5. Conclusion**

It is estimated that China's GDP growth will keep at the average rate of 7% in the coming decade. With such a rapid growth, more and more Chinese will be likely to purchase automobiles and undoubtedly, as the most populous country in the world,

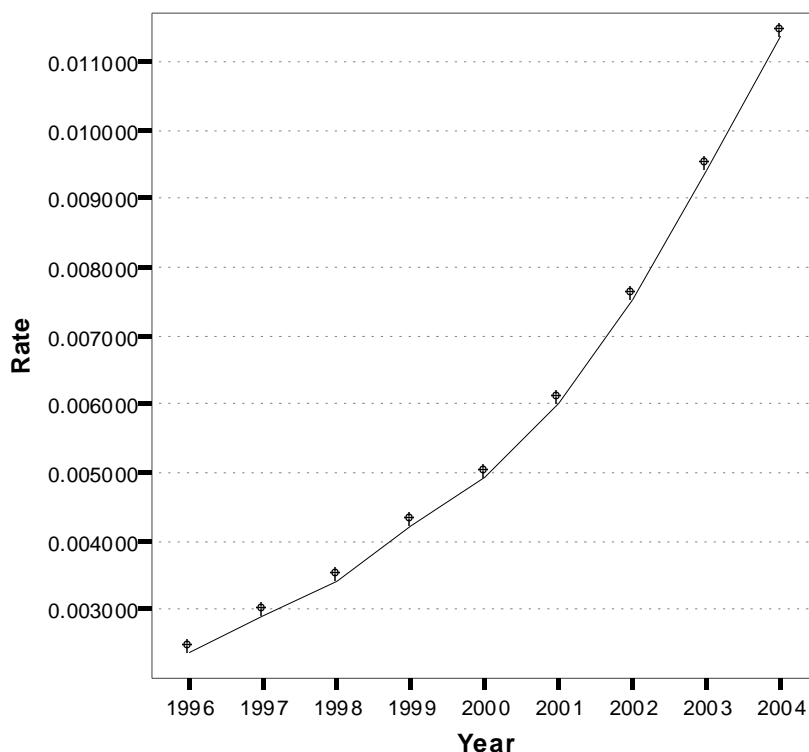
China will offer huge business opportunities to domestic and foreign manufacturers. As it moves into the 11<sup>th</sup> Five-year Plan, the Chinese government has taken some important steps to meet the almost-daily changes in competition and to prepare for the whole opening of its automobile industry on Jun 1, 2006. Competition among the major domestic automobile manufacture groups indicates that China's automobile industry is much more open than it was before admission to the WTO. In addition, the increasing import of foreign products produced by MNCs abroad such as Toyota, GM and BMW will only add more vigorous competition to the industry. However, since China's dramatic growth in economy, it is seen as the most important market for automobile manufacturers, both from abroad or domestic. The future competition in China's automobile industry will lead to larger scale economy and naturalization of higher technology. It is a big challenge for domestic manufacturers, and it is also a chance for them to develop. Competition makes China no longer an Eden for automobile producers and newcomers need to assess the potential benefit against the risk. However, consumers will benefit from such competition and the social welfare will undoubtedly increase. Since China has entered WTO for five years, the impact on China's automobile industry is still ambiguous and further research is needed

A1 Residents' average income of China



Source: China Year Book 2005

**Addenda Table 2.1 Automobile possession rate of China 1996-2004**



Source: China Year Book 2005

Addenda Table 2.2

Time	Discharge volume	2001. 1	2002. 1	2003. 1	2004. 1	2005. 1	2006. 1	2007. 1
Tariff(%)	<3L	70	43.8	38.2	34.2	30	28	25
Tariff(%)	>=3L	80	50.7	43	37.6	30	28	25
Ration(100 Million dollars)		60	80	Increase	15%	each year	Abrogation	

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