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**The Advance to Car Production and Globalization of
the Chinese Munitions Enterprises**

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**The Advance to Car Production and Globalization of
the Chinese Munitions Enterprises**

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Abstract

This paper undertakes a practical analysis on the Chinese munitions enterprises' advance to the car production, their formation of the development strategies and the globalization process with foreign-ventured enterprises in order to formulate their mass production system.

Along with the end of the cold war, the Chinese munitions enterprises began to transfer to the production of civilian goods. Automobile industry became the primary participation circle to each munitions enterprise. The most successful cases are Chang'an Automobile (Group) Liability Co., Ltd.(Chang'an Auto) to which Armament Industry Corporation(Armament Co.) affiliates, Changhe Aircraft Industry Co. and Harbin Aviation & Automobile Manufacture Corporation Ltd. to which Aviation Industry General Corporation affiliate. Their auto production were ranked the top forth, seventh and ninth in 1999.

The background conditions and organization structure of munitions enterprises are quite different with civilian enterprises in their advance to car production. Different with civilian enterprises, the car production of successful munitions enterprises almost started from zero and rapidly increased within short duration. Their development are close related with the development strategy to China of the global enterprises in the Chinese automobile market. This paper will analyze on the development history of the munitions enterprises and their globalization development based on the actual conditions.

From the historical view, the development of the Chinese munitions enterprises were affected by the relationship changes with Japan, the former Soviet and America, especially by the China-Japan War. Therefore the production bases of the Chinese munitions industry in the inner areas were set up during China-Japan War and were more enforced during the cold war between America and Soviet. The factories groups which were established in these production bases and produced military goods or machinery goods became the primary enterprises which shifted to the automobile production.

The successful munitions enterprises possess rather better management resources and location conditions. Especially, many years' technological know-how of its machinery

production, trial production of jeep, experience of small quantity production and the industrial foundation of Chongqing as the location of Chang'an Auto are important conditions which led to its success later.

The strategies of “giving up big road, undertaking two-side roads” especially “Mainly Targeting Minis” formulated by Armament Corporation and Aviation Corporation in their initial development period of vehicle production played an important role in rapid increasing of Mini vehicle makers such as Chang'an Auto and the advance to compact car production. After the technological introduction of compact car production, Armament Corporation adopted serial strategies, such as the enforcement of its coordination with foreign makers speedily, structure reorganization and listed stock and mainly increased the car production capacity of Chang'an Auto.

From now on, along with WTO participation and motorization, munitions enterprises' coordination with global enterprises such as Suzuki, Mitsubishi, Fuji Heavy Industry, GM and Daimler-Chrysler. will be more enforced and will plan more important role in compact car(around 1L) market.

1. Introduction

This paper undertakes a practical analysis on the Chinese munitions enterprises' advance to the car production, their formation of the development strategies and the globalization process with foreign-ventured enterprises in order to formulate their mass production system.

Along with the end of the cold war, the Chinese munitions enterprises began to transfer to the production of civilian goods. Automobile industry became the primary participation circle to each munitions enterprise. The most successful cases are Chang'an Automobile (Group) Liability Co., Ltd.(Chang'an Auto) to which Armament Industry Corporation(Armament Co.) affiliates, Changhe Aircraft Industry Co. and Harbin Aviation & Automobile Manufacture Corporation Ltd. to which Aviation Industry General Corporation affiliate. Their auto production were ranked the top forth, seventh and ninth in 1999(Table 1).

Table 1 Auto Production of Top Ten Manufacturers in the Chinese Automobile Industry (Year 1997~1999)

Manufacturer	(units)		
	1997	1998	1999
FAW	268,868	289,503	334,931
SAIC	232,074	236,411	230,946
TAIC	158,298	155,302	128,786
DMG	142,591	155,042	205,770
Chang'an Auto	113,899	110,999	171,012
Beijing Auto	105,657	81,759	121,308
Liuzhou Mini	90,008	102,088	81,018
Nanjing Auto	73,788	69,062	71,446
Changhe Aircraft	70,118	100,031	90,079
Harbin Airplane	50,018	58,322	86,017
Total, units	1,582,628	1,627,829	1,830,323

Resource: *China Automotive Industry Yearbook 1998*, P.76,113, *China Automotive Industry Yearbook 1999*, P.271,313,508,509. *CHINA AUTO*, Jan.2000.P.15..

The five munitions makers, i.e. Chang'an Automobile Corporation, Xi'an Qinhe Automobile Works, Jilin Jiangbei Manufacturer, Jiangnan Automobile Works to which Armament Industry Corporation affiliate and Guizhou Aircraft to which Aviation Industry General Corporation affiliates, shifted to car production with the production technique introduction from Japan. Among these five makers, the Chang'an Auto introduced technique from Suzuki in 1990. The market share of Chang'an Auto was rapidly increasing along with its successful parts localization. Its car production in 1999

was ranked the top fourth following Shanghai Automobile Industry Corporation(SAIC), Tianjin Automobile Industry Corporation(TAIC) and the First Automobile Works(FAW) (Table 2).

Table 2 Production of Chinese Car Makers (Year 1997~99)

(units)

Maker	1997	1998	1999
SAIC	230,443	235,000	254,236
TAIC	95,155	100,021	101,828
FAW	68,391	81,837	97,195
DMG	30,035	36,240	40,200
Chang'an Auto	28,861	35,555	44,583
Beijing Auto	19,377	8,344	9,294
Xian Qinchuan Auto	4,010	5,005	5,306
Guizhou Aircraft	1,660	1,064	1,529
Guangzhou Auto	1,557	2,590	10,008
Jilin Jiangbei Manufacturer	1,234	518	500
Jiangnan Auto	1,050	1,012	480
Total, units	487,695	507,861	565,366

Resource: *China Automotive Industry Yearbook 1998*, P.336,337, *China Automotive Industry Yearbook 1999*, P.154,509. *CHINA AUTO*, Jan.2000.12,P.14.

Note: The units of SAIC in 1999 includes the total units of Shanghai-VW and Shanghai-GM. The units of FAW includes the total units of FAW Group Corp. and FA-VW Automotive Co.. The units of Chang'an Auto includes the units of Chang'an Suzuki as well. The units of Guangzhou Auto includes the total production of Guangzhou Peugeot Automobile Co. in 1997, 2,246 units of Guangzhou Peugeot and 344 units of Guangzhou Honda in 1998 and the production of Guangzhou Honda in 1999.

The background conditions and organization structure of munitions enterprises are quite different with civilian enterprises in their advance to car production. Different with civilian enterprises, the car production of successful munitions enterprises almost started from zero and rapidly increased within short duration. Their development are close related with the development strategy to China of the global enterprises in the Chinese automobile market. This paper will analyze on the development history of the munitions enterprises and their globalization development based on the actual conditions.

Therefore, the focus of this paper are: (1)Under what kind of background did munitions enterprises formulate their advance strategies to vehicle in their transfer production to civilian goods from military goods? (2) How did they reorganize their structure and develop their car production along with the economic system reform? (3) How did they realize their car production globalization along with Chinese

motorization?

Chapter 2 focuses on the changes of outside environment and the accumulation of management resource of munitions enterprises; Chapter 3 focused on the strategy formulation and performance of the new advance production to vehicle; Chapter 4 concentrates on the shift of car production; Chapter 5 analyzes their strategy adjustment and system reorganization. After the previous discuss on the advance to car production and development process of munitions enterprises, chapter 6 analyzes the competition conditions of Chinese motorization and compact car production. Chapter 7 outlooks the car production globalization of the munitions enterprises.

2. The Historical Changes and Management Resource's Distribution of the Munitions Enterprises

From the historical view, the development of the Chinese munitions enterprises were affected by the relationship changes with Japan, the former Soviet and America, especially by the China-Japan War. This chapter analyzes the historical development of munitions industry, the primary distribution and technological foundation of munitions factories before their advance to automobile industry in 1980s.

The beginning of the Chinese modern munitions industry was the “Foreign Introduction Activities” in the end of the nineteenth century. Several giant armament factories were built in big cities of the eastern China. For examples, the predecessor of Chang’an Auto Works—Chang’an Manufacturer Works and the predecessor of Construction Industry Group Corporation(motorbike production under the joint-venture with Yamaha)—Hanyang Armament Works were established during this period. Chang’an Manufacturing Works was established during the foreign introduction activities as Shanghai Modern Artillery Plant in Shanghai Songjiang by Li Hongzhang in 1862, the end of the Qing Dynasty. Later it changed to Suzhou Modern Artillery Plant in 1863 and moved to Nanjing in 1865 with artillery production as Jinling Manufacturing Plant.

In 1937, China-Japan War started and many munitions factories were moved to the inner areas from the coast areas due to the Japanese military invalidation. The groups of munitions industry factories were formed in the southwestern areas, mainly around Chongqing—the temporary capital of the National Party Government. For examples,

Chang'an Manufacturing Works and Construction Industry Group Corporation were typical munitions enterprises which moved to Chongqing together with the National Party Government because they were regarded as the main attack targets of the Japanese military army. Moreover, important civilian enterprises in coastal areas were also moved to the middle and west areas in the war.

In 1950s new munitions factories, i.e. airplane and missile production factories began to be established in the east areas with the assistance of the former Soviet. For examples, Harbin Dong'an Automobile Engine Corporation which affiliated to Aviation Industry General Corporation later and Shenyang Xinguang Engine Manufacturing Corporation were established in this period. Among these enterprises, Harbin Dong'an Automobile Engine Corporation and Harbin Airplane Manufacturing Corporation which affiliated to Aviation Industry General Corporation were giant enterprises which were established in 1950s in order to produce fighter planes.

From the middle of the 1960s, "The Third Front Construction"¹ was undertaken based on the lessons from the China-Japan War for preparation for the war with America or the Soviet and many enterprises, human resources and equipment were transmitted into the southwestern areas like Sichuan Province. And many airplane, missile, armament and machinery production bases were established. Among the "The Third Front Construction", armament industry was mainly transferred to the city of Chongqing in Sichuan Province as one of the most important national projects and the production bases of conventional weapons and important machinery equipment were established near Chongqing. Many factories were established and enlarged. Relatively iron & steel factories in Chongqing were enlarged and moreover the construction of chemical industry, machinery industry, coal industry and power plants were conducted. Meanwhile Guizhou Aircraft Manufacturing Works(011 Base)--the predecessor of Guizhou Aircraft was established which transferred its factory equipment to the mountain areas of Anshun (Guizhou Province) from the city of Shanghai and Tianjin in order to produce military airplanes or fighter planes. Changhe Aircraft Industry Co. was established in Jingdezhen(Jiangxi Province)to produce helicopter & mini-bus and Shanxi Aircraft Industry Co. was established in the Hanzhong areas of Shanxi Province

¹ Serial of large industry and infrastructure construction were undertaken in inner China from 1964 to 1970s. Over that period, China was quite isolated with other countries because of tense relationship with America and broken coordination relationship with Soviet. The construction which was prepared for the expected great war was called "The Third Front Construction".

to produce military transportation planes.

Therefore the production bases of the Chinese munitions industry in the inner areas were set up during China-Japan War and were more enforced during the cold war between America and Soviet. The factories groups which were established in these production bases and produced military goods or machinery goods became the primary enterprises which shifted to the automobile production.

3. The Strategy Formulation and Performance of the Advance to Vehicle Production

From the beginning of 1980s, the order of military goods decreased along with the relaxation of the cold war and the development of market economy. Many enterprises of the munitions industry such as normal armament, airplane, missile & satellite and rear service began to transfer to the civilian market and the production of civilian goods of machinery, chemical industry and optical electron, based on the government industry policy - "Military and Civilian Combination , Military Resistance and Advance to Civilian" Among all these industries, automobile industry became the primary cycle for the munitions enterprises development.

The names of the administration units of the aviation industry, armament industry and missile & satellite industry were changed into the Aviation Industry Ministry, Armament Industry Ministry and Aerospace Industry Ministry from the former Third, Fifth and Seventh Machinery Industry Ministry in 1982. Between the end of 1980s and the beginning of 1990s, they were further reorganized into Aviation, Armament and Aerospace Industry General Corporations. In the late 1980s, the Department of Automobile and Ship of the former Rear Service Department of the Liberation Army was reorganized into the Jinyan Automobile & Shipping Industry Corporation.

The munitions enterprises formulated their strategy when the automobile market was filled with medium truck and short of heavy and light truck. Under such outside environment condition, each munitions enterprise made its affiliated company develop its vehicle variety except medium truck production based on its different management resource. For examples, the advance strategy to vehicle production of Armament General Corporation was typical for "giving up big road, undertaking two-side roads"(giving up the medium truck production and undertaking the advance to other

vehicle variety).

In the late 1980s and especially in the 1990s, market needs of mini vehicle was increasing and the production was rapidly developed. Mini vehicle in this period was one of the most developing automobile varieties in the Chinese automobile production. Due to the market change, Armament General Corporation and Aviation General Corporation made their affiliated corporations to transfer the automobile production strategy quickly to “Mainly Targeting Mini” and developed their production. For examples, among the Chinese top 8 companies in mini vehicle production, 5 companies(Chan’an Machinery Manufacturing Factory, Anhui Huaihai Machinery Factory, Harbin Airplane Manufacturing Corporation, Changhe Aircraft Industry Corporation and Shanxi Airplane Manufacturing Corporation) are munitions enterprises. The mini vehicle produced by these five companies from 1990s, have taken the half part of the whole production in the Chinese mini vehicle production.

The Mini vehicle production of Armament General Corporation mainly relies on Chang’an Machinery Manufacturing Factory and Anhui Huaihai Machinery Factory. These two factories both have introduced the mini vehicle production technique from Suzuki. Anhui Huaihai Machinery Factory was later combined with Changhe Aircraft Industry Corporation which affiliated to Aviation General Corporation. The case of Chang’an Machinery Manufacturing Factory will be discussed.

Although Chang’an Machinery Manufacturing Factory had the experience of trial production of military jeep and small quantity production, it mainly produced special machinery. It shifted to automobile production in 1981 and began to develop mini vehicle by imitating Suzuki’s products. In 1984, it introduced CKD parts from Suzuki and started its assembly production. The initial annual production plan was 30,000 units, but revised to 100,000 units plan in 1994 due to its 90% localization rate. From the beginning of 1990s to the middle of 1990s, Chang’an Machinery Manufacturing Factory kept occupying over 20% share in national Mini vehicle market.

The Mini vehicle production of Aviation General Corporation utilized the Suzuki’s technique and mainly relied on the three corporations i.e. Harbin Airplane Manufacturing Corporation, Changhe Aircraft Industry Corporation and Shanxi Airplane Manufacturing Corporation. Their production have rapidly increased since 1990s and the three corporations occupied over 40% of the Chinese automobile market

share in 1998. Harbin Dong'an Automobile Engine Corporation introduced production technique of Mini vehicle engine from Suzuki in the middle of 1980s and became most largest engine makers to supply six corporations among top 8 Mini vehicle makers for long period except Tianjin and Chang'an which were eight top Mini vehicle production corporations.

Therefore over half of Armament General Corporation and Aviation General Corporations' affiliated makers are active in their vehicle production and have mainly participated in Mini vehicle production since 1990s. Their vehicles & parts outputs have finally occupied about 60% of all their civilian goods outputs.

4. The Advance to Car Production and the Flaws of Government's Policy

Many technique introduction projects of car production were undertaken in 1980s. In order to resistant car production, the central government issued a proposal on Dec. 24, 1988 which identified 6 corporations as "Gig Three and Small Three" (Car production corporations as Gig Three—the First Auto Works, Dongfeng Motor Group and Shanghai Automobile Industry Cooperation; Technique introduced corporation as Small Three---Beijing Automobile Corporation, Tianjin Automobile Industry Corporation and Guangzhou Automobile Industry Corporation.)

In spite of the strict policy's restriction, munitions enterprises were active in compact car trial production and technique introduction in order to resolve their insufficient utilization of capacity due to the decrease of military goods orders. For example, Armament General Corporation's Hunan Xiangtian Jiangnian Machinery imitated Citroen 2CV(France) and Fiat 126P(Italy) in 1985, Jilin Jiangbei Manufacturer imitated Fiat 126P and Fuji Heavy Industry's Combi in 1986 and Xi'an Qinchuan Machinery Factory imitated Fiat 126P and Honda Today in 1986. Without government approval, Guizhou Aircraft Industry Corporation introduced the technique of REX compact car from Fuji Heavy Industry in 1989, Chang'an Machinery Factory and Armament General Corporation's 3 factories with trial car production mentioned above began their small quantity production by introducing the technique of Alto compact car from Suzuki through Armament General Corporation in 1990.

Armament General Corporation and Aviation General Corporation recognized the impossibility of actual car production without government formal approval after their

efforts of self-depended trial production and technique introduction. Therefore Armament General Corporation and Aviation General Corporation were active in pushing for permission of the central government from the beginning of 1990s in order to obtain introduction projects of car production technique. It was just the period when the cold war between America and Soviet was over and the military production was decreasing. The central government had to give up the car production restriction as “Gig Three and Small Three” and approved the car introduction projects of Armament General Corporation and Aviation General Corporation in April,1992. Therefore the production system of the Chinese automobile industry changed to “Gig Three, Small Three and Mini Two ” from the previous “Gig Three and Small Three”.

The project of car technique introduction of Armament General Corporation first began with the introduction of Alto technique from Suzuki and the construction plan of car production bases mainly like Chang’an Machinery Manufacturing Factory. Chang’an Machinery Manufacturing Factory introduced Suzuki’s Alto production technique in November, 1990 and produced 54 units in 1990 and 245 units in 1991 by introducing CKD parts. In 1992, its parts localization rate reached 12.68%. After the formal approval of car project from the central government in 1992, Chang’an Machinery Manufacturing Factory formulated its production plan of 50,000 units till 1995 and 100,000 units till 2000.

But Armament General Corporation considered its whole above-mentioned affiliated corporations which rushed to their car trial production and encouraged Hunian Xiangtian Jiangnan Machinery Factory, Jilin Jiangbei Manufacturer and Xi’an Qinchuan Machinery Factory to produce cars beginning with Chang’an Machinery Manufacturing Factory which introduced Suzuki’s Alto car production(Table 2). That is one production project was carried out by 4 makers which was an exception case in strictly controlled automobile projects and was severely criticized in automobile circle. Therefore, when Armament General Corporation established “Chang’an Suzuki Automobile Corporation Ltd.” in June, 1993, a joint venture between Chang’an Machinery and Suzuki & Nissho Iwai, it was not approved by the central government for many years.

On the other hand, car technique introduction project of Aviation General Corporation was carried out by Guizhou Aircraft Industry Corporation which began to produce Fujitsu Rex from 1989. Guizhou Aircraft Industry Corporation decided to participate mainly in automobile parts production from the late of 1980s and began to

produce Santana's parts of Shanghai-VW. In 1992 over 20 affiliated factories of Guizhou Aircraft Industry Corporation supplied many makers like Shanghai-VW, TAIC, Guangzhou Automobile Corporation, First Automobile Factory, Beijing Automobile Factory, Nanjing Automobile Factory with its automobile parts. Beyond the development of parts production, Guizhou Aircraft Industry Corporation introduced the production technique of Fujitsu Subaru Rex KF-1 compact car and its assembly production in 1989. With the formal approval from the central government, Guizhou Aircraft Corporation formulated its upper-production plan of 10,000 cars and 15,000 engines till 1995.

5. Structure Reorganization and the Development of Car Production

After the introduction of car technique, Armament General Corporation was active in its strategy readjustment and structure reorganization in order to develop its car production.

First, affiliated makers which produced vehicles except cars were transferred to other corporation groups or local government. For example, Yunnan Blue Arrow Automotive Factory which produced light truck was transferred to First Automobile Works, Anhui Huaihai Machinery Factory which produced mini vehicle was combined with Aviation General Corporation's Changhe Aircraft Industry Corporation, Inner Mongrel First Machinery Manufacturing Factory which produced heavy truck was joint ventured with Baotou local government. Moreover, project investment focused on Chang'an Automobile (Group) Liability Co., Ltd. and the locations of Hunan Xiangtian Jiangnan Machinery Factory, Jilin Jiangbei Manufacturer, Xi'an Qinchuan Machinery Factory With introduction of Alto technique were transferred to where their own local government located in avoid of the spare distribution of car production. For example, in April, 1997, Xi'an Qinchuan Machinery Factory was changed to "Xi'an Qinchuan Automobile Liability Co., Ltd." with 5 billion capital yuan (55% capital from Shanxi Province government and 45% capital from Aviation General Corporation).

Second, after the introduction of car production technique Chang'an Machinery Manufacturing Factory shifted its production focus from mini vehicles to compact cars immediately due to the rapid developing car market. In June, 1993, "Chongqing Chang'an Suzuki Automobile Corporation", a joint venture with Suzuki, was established. Capital rate was Chang'an Machinery Manufacturing Factory's 51% and Suzuki and Nissho Iwai's 49%(Suzuki:Iwai was 7:3). Even though this joint venture

was not approved by the central government, it showed the active management strategies of Chang'an and Suzuki.

Third, with the approval of the Aviation General Corporation, Chang'an Machinery Manufacturing Factory established "Chang'an Automobile (Group) Liability Co., Ltd.", a general corporation with car production and sales activity, which combined with Engine Factory, Jiangling Machinery Manufacturing Factory(Chongqing) in the end of 1994. In 1995, annual car productivity of Chang'an Machinery Manufacturing Factory reached to 150,000 units and the annual engine productivity was 360,000 units, which became one of the top 5 biggest car makers together with Shanghai-VW, First Automobile Factory, Dongfeng Motor Group and Tianjin Automobile Industry Corporation. Meanwhile, through Aviation General Corporation's negotiation with central government, Chang'an Machinery Manufacturing Factory obtained the most biggest project with 56.5 billion yuan(RMB) capital among national 9th 5-year plan(Year1996-2000) in the end of 1996.

56.5 billion yuan capital was gathered by the loan from Chinese Development Bank, Japanese Import & Export Bank and its listed stock. In November, 1996, Chang'an Automobile (Group) Liability Co., Ltd. listed its 33.04% foreign oriented stock in Guangdong Province's Shenzhen Security Exchange and gathered 5.83 billion yuan. Suzuki purchased about half of its stock(Stock B) and obtained 16.5% of Chang'an Automobile (Group) Liability Co., Ltd.'s stock by 50 billion JP Yen. Continually Chang'an Automobile (Group) Liability Co., Ltd. listed its domestic stock(Stock A) in June, 1997, and gathered 7 billion capital yuan. Therefore, Chang'an Automobile (Group) Liability Co., Ltd. gathered 13 billion capital yuan together by its twice listed stock and invested in its assembly and parts factories.

The parts supply network set-up of Chang'an Automobile (Group) Liability Co., Ltd. stated together with the technique introduction of mini vehicle. From 1985, the Armament Industry Ministry, the processor of Armament General Corporation established "Chongqing Chang'an mini vehicle Unity" and began the settlement of its parts supply network by coordination with Chongqing City government. Later on, in order to carry out the production development strategy, Armament General Corporation, Chang'an Automobile and Chongqing government made more their investment in parts makers around Chongqing City and enforced network function by technique introduction promotion. With this enforcement effort, the parts localization rate of

Chang'an Automobile's Alto was increasing and reached to 85.25% in 1996.

Chang'an Automobile made an effort in quality control as well as its technique introduction. In its military goods production, the image of "Munitions' Quality" was created. Chang'an Automobile was active in introducing quality control method from Suzuki and promoted its method through its joint venture corporation. For example, after the establishment of joint venture corporation with Suzuki, Mr. Watanabe from Suzuki was nominated as general president. Even though he returned Japan after his three-year tenure, Chang'an Automobile appreciated him highly and nominated him again as the new president of Assembly factory and engine factory of Mini truck. After Mr. Watanabe resigned from Suzuki, he becomes technique consultant in Chongqing. With the promotion of practice of the advanced control method, employees' incentive was increased by quality control method and bonus system. Moreover, Chang'an Automobile introduced Dutch's quality control method—Audit in 1997 and made its achievements. With its emphasis on quality control, the products of Chang'an Automobile were highly appreciated domestically and began its export overseas. In the beginning of 1989, Chang'an Automobile exported its 2500 Mini trucks to America and mini vehicle to Syria, Morocco, Argentina And other countries later on.

Along with its production development, Chang'an Automobile set up its national sales network by the coordination with Armament General Corporation. Installment sales was practiced and active marketing & after-service activity were promoted. In 1996, about 300 domestic after-service bases were set up. Due to these activities, Chang'an Automobile's share in the Chinese automobile industry increased gradually even in the intensified market competition in the later 1990s and climbed to top 4 in 1999 from top 7 in 1995.

In contrast to Chang'an Automobile's project, the car production of Guizhou Aircraft did not develop so much. Since its car technique introduction till 1996, the initial production plan of 10,000 units was not realized and its actual annual production did not reached to 2,000 units neither. Therefore it was ranked as the last one among "Gig Three, Small Three and Mini Two". In order to get rid of such condition, Guizhou Aircraft established a joint venture corporation with Fuji Heavy Industry in 1997. Guizhou Aircraft and Guizhou United Automobile Industry Group Corporation provided 51% capital(3.6 billion yuan) and Fuji Heavy Industry provided 49% capital(2.94 billion yuan). The aim of the new joint venture corporation was annual car

production of 10,000 units till 2000. But there were not so much development in Guizhou Aircraft's car production(Table 2).

Several points are considered as the reasons of the failure of Guizhou Aircraft. First, unlike Chang'an Machinery, Guizhou Aircraft did not have any experience in machinery industry, trial production and small quantity production of automobile. It used to focus on aircraft industry and started automobile production from zero. Second, unlike Chang'an Machinery which had strong foundation of machinery industry and located in industrial metropolitan city—Chongqing with parts makers around, Guizhou Aircraft located inside the mountains of Guizhou Province with very weak industry foundation. Guizhou Aircraft could only produced small quantity parts and it was impossible to undertake car mass production because of its inferior location conditions. Third, unlike Chang'an Machinery, Guizhou Aircraft did not have long-term technique introduction origin and any introduction experience of similar auto series. Guizhou Aircraft almost started its technique introduction from its new origin. It took long time to assimilate introduced technique and set up the relationship with introduction origin. Moreover, in contrast to Chang'an, Guizhou Aircraft was not financially coordinated with local government, senior corporation and foreign enterprise. And its capital circulation was slow due to the rapid decrease of military goods production and additional investment was impossible in car production.

6. Motorization and Competition of Compact Car

Along with the future WTO participation, the Chinese motorization is mostly possible to start with compact car of 1L(liter) stroke volume from the eastern metropolitan cities in consideration of national income level and compact car's price. In 1998, the annual income of one employee in eastern coastal metropolitan city is almost over 10,000 yuan (e.g. Beijing's 12,451 yuan, Shanghai's 13,580 yuan, Guangdong's 11,031 yuan). Most couples both work and it is possible their family annual income will extend 20,000 yuan. Till the middle and late 2000s, it is possible for these family's average annual income to reach 40,000 yuan if the annual increasing rate reaches 7% which is proposed by the Chinese government. (With actual over 7% already every year). In 1999, compact car with 1L stroke volume around is 40,000~80,000 yuan(Rex 0.54L is 4.5000 yuan, Alto 0.8L is 50,000 yuan, Charade 1L is 60,000 yuan and Charade 1.3L is 80,000 yuan). At present, the price of car in China is protected by 80~100% import customs. In 5 years after WTO participation, the import custom will be lowered to 25% and the price of car

will be around half. In a word, car price in the Chinese automobile market is decreasing. The price of 1L compact car will be reasonable in regards of such family's annual income in the middle of 2000s. There are 2~3 billion great population in the eastern big and medium cities. Regarding with the difference of such population's income, motorization beginning from compact cars in the eastern cities is possible to be realized along with WTO participation. According to several automobile purchasing families survey, the families which have purchased car in the eastern cities only took 2.6% of the whole families in 1999 and the average price per unit was 64,000 yuan. Moreover, according to the model survey to people in Guangzhou, Shanghai, Beijing, over 70% of the families intended to buy car within 5 or 10 years.

The Chinese automobile makers are very active in an advance to 1L compact car production along with the coming of motorization period(Table 3). From March, 2000, FAW's Jilin Light Factory has developed car-shaped van together with Japanese East RND Corporation and begun to produce "Jia Bao" CA6350 light van with DA465Q-1 1.04L engine produced by Aviation's Dong'an Engine Factory(technological introduction from Suzuki). FAW's Research Institute has developed 1.0L~1.3L compact car and has already released its new model car. Dongfeng Motor Group first made its Nanjing-DFM Motor Co., Ltd. participate in an advance to Mini vehicle production in 1992 and gathered production capacity of 20,000 Mini vehicles in 1996 and finally in 1997 its Mini vehicle production jumped to top 8th corporations. Later on, Dongfeng Motor Group began to develop 1L Little Price EQ7100AF compact car by utilization domestic parts from 1995 and got the approval from National Machinery Bureau in Aug. 1998. On the other hand, SAIC's Delta Automobile Technique Center developed Unicorn compact car with 1.2L engine in January 2000. Relatively, in March 2000, Shanghai-GM release to produce mini vehicle together with Liuzhou Mini Vehicle Factory, the most biggest Mini vehicle maker and begins its car mass production gradually. Shanghai-VW released 2001's Polo's investment project. TAIC was approved to produce face-lifted 1L Charade with the assistance of Daihatsu in July 1997. Moreover TAIC releases its new Charade with Toyota's 1.3L 8A-FE4 engine in September 1998 and formulated its annual production plan with 300,000 units till 2000. In the beginning of 2000, its joint venture with Toyota was approved by the government and the investment projects of Toyota's NBC1 and NBC2 were formulated as well.

Meanwhile, each enterprise reorganized its structure which made transfer participation in compact car production from munitions industry and undertook its new

Table 3 Production of Compact Car Makers and Their Globalization in the Chinese Automobile Industry

Production Time: 1998 Year Unit

Manufacturer	Affiliated Maker	Brand (stroke volume)	Production Starting	Production	Technique/Capital Coordination Foreign Company	Global Corporation Group
	Dongfeng Motor Group	“Little Prince” EQ7100AF (1L)	Year 2000			
FAW Group Corp.	Jilin Light Vehicle Factory	“Jiobao” CA6350 Vehicle Van (1.04L)	2000		East RDN / Joint Development	
		1L-1.3Lcompact Car	2001			
	FAW-VW	Unclear	2001		VW	VW
Shanghai-VW	POLO (1.3L)	2001		VW		
Shanghai Automotive Industry Co.	Delta Automobile Technique Center	“Unicorn” (1.2L)			GM	GM
Armament General Co.	Chang’an Automobile (Group) Liability Co., Ltd.	Alto(0.8L), “Antelope” (1L,1.3L)	1992	35,555	Suzuki	
Aviation General Co. (China Mini Vehicle Group)	Guizhou Aircraft Industry Co.	Subaru Rex (0.6L)	1992	1,064	Fuji Heavy Industry	
	Harbin Hafei Motor Co., Ltd.	“Baili” “Lancer” Base (1.3L)	2000		Mitsubishi Automobile	Daimaru-Chrysler
Tianjin Automotive Industry (Group) Co., Ltd.	Charade Automobile Liability Co., Ltd.	Charade (1.0L,1.3L)	1986	82,240	Daihatsu	Toyota
	Tianjin-Toyota	NBC1,NBC2 (1.3L)	2000		Toyota	
Independent	Jiangsu Yuda Group (Nanjing)	“Pride” Base(1.3L)	2000		Hyundai Group	
	Jili Group (Zhejiang)	“Haoqing” (1.3L)	2000		Imitation of Charade with Tianjin-Toyota’s Engine	

Note: Compact car refers to the car with engine of less than 1.3L stroke volume.

strategy in order to develop its car production.

Chang'an Automobile has developed to big corporation group with annual productivity of 300,000 vehicles(150,000 compact cars and 150,000 Mini vehicle) and 360,000 engines by combining Chongqing Changjiang Electronic Factory with Mini vehicle production and Hebei Victory Coach Factory with small van production in 1998 in order to develop its car production further. Meanwhile, from 1998 Chang'an Automobile began to produce few "Antelope" 1L II compact car and 1.3L car besides the normal production of 0.8L I Alto.

The Mini vehicle's production capacity Aviation Corporation's Changhe Aircraft Industry Co. was increasing by the combination with Armament Corporation's Anhui Huaihai Manufacturing Factory in 1997. In the beginning of 1998, the powerful 4 makers of Aviation Corporation—Harbin Aircraft Manufacturing Corporation(Mini vehicle), Changhe Aircraft Industry Co.(Mini vehicle), Guizhou Aircraft Industry Corporation(compact car) and Harbin Dong'an Automobile Engine Co.(engine) were combined to "China Mini Vehicle Group Co.", as the most biggest corporation group of Mini vehicle production. Its purpose was to transfer the Mini vehicle production to compact car production. Harbin Dong'an Automobile Engine Co. introduced the engine of 1.3L compact car from Mitsubishi Automobile in Aug. 1996. Harbin Aircraft Manufacturing Corporation developed "Baili" compact car by utilizing this engine and began its small quantity production. Moreover, Harbin Aircraft Manufacturing Corporation developed its compact car and formulated its production plan with 20,000~30,000 units by the coordination with Mitsubishi Automobile in Jan. 2000.

Therefore, there are 6 corporation groups, 4 civilian corporation—FAW, DMG, SAIC(including Liuzhou Mini Car), TAIC and 2 munitions corporations—Chang'an Automobile, China Mini Vehicle Group which participate in compact car production. Among these groups, FAW, DMG, SAIC have just begun their compact car production with no so much production capacity. TAIC, Chang'an Automobile and China Mini Car Group have rather higher production capacity.

Currently, the competition of 1L compact car probably undertakes among TAIC, Chang'an Automobile and China Mini Car Group. In the near future, the quality of assembly car and parts will become the important focus of market competition besides the function of developed model car. Although TAIC produces qualified engines by the

joint production with Toyota, rough and slipshod work has existed for long period already. It is difficult to improve thoroughly the quality of parts and assembly cars within short period. In contrast to TAIC, Chang'an Automobile and China Mini Car Group have experience of military goods production and their products are highly appreciated in market because of their emphasis on quality control. The vehicle and car production of munitions enterprises is increasing in consecutive years (Table 1 & Table 2). It is obvious that TAIC is confronted with the tendency of standstill and declination. The quality difference of assembly cars and parts will become the important factor which influence the competition superiority of each compact car makers.

7. The Globalization of Munitions Enterprises' Car Production

In present, the competition of around 1L compact car production is undertaken among above-mentioned 6 groups, i.e. FAW, DMG, SAIC (including Liuzhou Mini Car), TAIC, Chang'an Automobile and China Mini Car Group. The products of FAW and DMG are regarded as national ones because of their self development. In contrast, the compact cars of SAIC will be combined with VW-Polo and presently are influenced by GM group with Delta Automobile Technique Center (a joint venture with GM) and Shanghai-GM. TAIC has introduced Daihatsu's products and is developing its joint venture with Toyota. Therefore, Toyota will become TAIC's important strategy partner.

The globalization is undertaken in two munitions enterprises as well. Chang'an Automobile introduced Mini vehicle production technique in 1984 and compact car production technique in 1992 from Suzuki. It has formed steady partnership with Suzuki by regularly inviting Suzuki's technicians in its technological management and quality control. In 1993, the joint venture with Suzuki was established and the capital relationship with Suzuki was enforced by its listed stock and its stock purchase by Suzuki in 1997. Chang'an Automobile will rely more on Suzuki in its technological management and product development along with the intensified competition in car market.

While, in September 1998, the Suzuki's stock ownership of GM reached to 10% from 3.3% and has become Suzuki's primary stock holder. The GM's orientation in development and sales of compact cars in Asia and Pacific together with Suzuki is obvious. Referring to the purpose of the coordination with Suzuki, GM's vice president explained "The compact cars are hopeful in new developing market such as China." He

clarified the joint vehicle production with Suzuki in Chinese market of up-coming vehicle popularization.

On the other hand, Aviation Corporation's enterprises' coordination relationship with Mitsubishi is gradually enforced by the joint venture of engine production and joint development of compact car. Mitsubishi Automobile separately established joint venture engine production corporation with 150,000 productivity from 2000 with Aviation Corporation's Harbin Dong'an Automobile Engine Corporation and later with Aircraft Corporation's Shenyang Xinguang Engine Manufacturing Corporation in August 1996. Their engine production of stroke volume 1.3L(Harbin Dong'an) and 2.2~2.4L(Shenyang Aircraft) for vehicle has started. The 1.3L engine produced by joint ventured Harbin Dong'an Mitsubishi is prepared for the forthcoming compact car development of each Mini vehicle makers of Aviation Corporation. Along with the structure reorganization of big Mini vehicle makers, Mitsubishi Automobile developed a compact car based on "Lancer" together with Harbin Aircraft Manufacturing Corporation in January 2000 and aimed on-spot production with 20,000~30,000 units.

Moreover, Mitsubishi has set up its full cover sales network in whole China by the establishment of its fully ventured sales sub-corporations in Shanghai in 1998, Guangzhou in 1999 and Dalian & Tianjin in 2000. While in March 2000, Daimler-Chrysler provided Mitsubishi 34% capital which has actually obtained Mitsubishi's management privilege. Therefore Daimler-Chrysler has got compact car production technique in Chinese and Southeastern Asian markets with the coordination with Mitsubishi by utilizing Mitsubishi's foundation network. From now on, the coordination with each Aviation Corporation's makers on the compact car production has become important part of Daimler-Chrysler's strategy.

In a word, Chinese production globalization of compact car around 1L will mainly undertakes among TAIC-Daihatsu-Toyota, Chang'an Auto-Suzuki-GM and China Mini Auto Group-Mitsubishi-DaimlerChrysler. The quality control superiority of each munitions enterprise influences not only domestic competition greatly but also international strategies of the global enterprises with the coordination relationship with the above makers. For example, in its localization development of Santana parts, Shanghai-VW chose the munitions enterprises as its supply makers which had earliest reached VW's strict quality conditions. From now on, along with the production development, those which can reach quality standard of global enterprise by utilizing

the superiority of low cost and develop overseas will probably be the enterprises with superior quality control. Therefore, those global enterprises with the coordination relationship with the munitions enterprises can release their products produced in Chinese national market and overseas market and enjoy fully the merit of mass production.

8. Conclusion

Several points are clarified by the analysis of the advance performance to vehicle production of the munitions enterprises, especially the advance strategy of compact car production in Chang'an Auto and Aviation Corporation's enterprises. First, the successful munitions enterprises possess rather better management resources and location conditions. Especially, many years' technological know-how of its machinery production, trial production of jeep, experience of small quantity production and the industrial foundation of Chongqing as the location of Chang'an Auto are important conditions which led to its success later. Second, the strategies of "giving up big road, undertaking two-side roads" especially "Mainly Targeting Minis" formulated by Armament Corporation and Aviation Corporation in their initial development period of vehicle production played an important role in rapid increasing of Mini vehicle makers such as Chang'an Auto and the advance to compact car production. After the technological introduction of compact car production, Armament Corporation adopted serial strategies, such as the enforcement of its coordination with foreign makers speedily, structure reorganization and listed stock and mainly increased the car production capacity of Chang'an Auto. From now on, along with WTO participation and motorization, munitions enterprises' coordination with global enterprises such as Suzuki, Mitsubishi, Fuji Heavy Industry, GM and Daimler-Chrysler. will be more enforced and will plan more important role in compact car(around 1L) market.

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