

**The Chinese Automobile Industry and the Strategic
Alliances of China, Japan, the US's Firms**

--The Cases of FAW-Toyota, Dongfeng-Nissan and Shanghai-GM--

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1. Introduction

Recently, the rising Chinese manufacturing industry and progress of its international competitiveness have attracted worldwide attention and then, multinational enterprises in Japan, US, Europe and Korea have been urged to convert or make adjustment of their management strategies to China. Meanwhile, a praiseful story for the "World Factory" due to rising "Made in China" products and another "Theory of Threat by Chinese Industries" have emerged. From our point of view, they look inclined to be emotional, lacking fair analysis toward industries and enterprises endorsed by objective observation.

In 2002, an automobile industry alongside a consumer electronic industry consistently announced big comprehensive alliance projects between Chinese and Japanese companies. The representative examples were comprehensive alliance agreements of Nissan - Dongfeng Motor (Dongfeng) and Toyota - First Automotive Works (FAW).

For the automobile industry, we elaborate key factors for competitive strategies between leading Japanese and Chinese companies from the view of "Full-Line". Then, picking up the leading companies that have concluded comprehensive business partnership agreement such as Nissan - Dongfeng and Toyota - FAW, we compare with each company's competitive strategy. In order to discuss transfer of technology, I also highlight a case that the Toyota Production System has been transferred to China, and then analyze the Toyota's eastbound transfer and GM, Opel's westbound transfer. Lastly, I propose the international comparison between China and Japan, Korea and European countries to confirm the presence of Chinese automobile industries.

2. Factor of Strategic Alliance: Full-line Policy

In the automobile industry, a keyword of selecting a partner of strategic alliances for mainly Japanese firms is "Full-Line"¹. In

¹ In general, "Full-line" means one automobile manufacturer systematically provides every product line (size of car) from small sized, low priced popular car, midsize car to luxury car in order not to lack some size, while avoiding competing each other, that is to say, not raising cannibalization. Hiromi Shioji, "The Present Situation and Challenges of the Marketing" pp. 62, *Survey of Automobile and Related Industries in China*, Gendai Advanced Studies Research Organization, 2003

order to meet active demand of emerging, diversified Chinese market, supply capacity and its speed provided by automobile manufacturers are critical. Behind the proliferation of almost 120 carmakers is that there existed a macro-economic factor of local protectionism in China as well as a submerged insufficient capabilities for fulfilling "Full-Line" policy: that is to say an issue of corporate strategy and organizational capability. Especially, manufacturers for passenger cars show obviously such a tendency.

It is Chinese market-entered multinational companies that make up for insufficient supply capability of local firms. Chinese technique of mass-production for passenger car such as Santana and Charade (original manufacturers in Japan and Germany have terminated the production respectively) has come to be obsolete, and further, a line-up for passenger cars included rather poor. Thus, explosive popularity for Japanese cars of Honda Accord and Toyota Vios implies backlash of the distorted supply structure for passenger cars, and you should regard it as the end of the "You get what you pay for" era. Table 1 indicates sales volume, sales price and market share of primary vehicle models in China (the first half of 2001).

Table 1 Sales and Prices of the Passenger Cars in Chinese Market □The 1st half of 2002□

Models	Sales	Same Period '01	Growth Rate	Market Share	Same Period '01	Price (yuan)	
	(Unit)	(Unit)	(%)	(%)	(%)	Dec.2001	Aug.2002
Santana	71,044	73,411	-3.22	15.67	22.03	118,500	111,200
Jetta	57,848	48,504	19.26	12.76	14.55		111,500
Charade	39,725	34,091	16.53	8.76	10.23	87,900	76,400
Citroen ZX	30,216	27,851	8.49	6.67	8.36		131,800
Sail	26,505	2,691	884.95	5.85	0.81	100,000	92,800
Accord	25,364	25,454	-0.35	5.60	7.64		265,000
Buick	19,972	13,205	51.25	4.41	3.96	288,000	28,800
Bora	17,264	0	-	3.81	0.00		193,300
Red Flag	16,163	6,572	145.94	3.57	1.97		219,000
Bluebird	12,866	5,917	117.44	2.84	1.88		221,800
Polo	8,817	0	-	1.95	0.00		140,000
Alto	8,283	0	-	1.83	0.00		43,600
Platz	6,717	5,524	21.60	1.48	1.66	119,800	98,600
Cultus	5,710	6,566	-13.04	1.26	1.97		74,800
Pario	4,542	0	-	1.00	0.00		
Odyssey	2,619	0	-	0.57	0.00		
Elysee	2,255	0	-	0.49	0.00		
Cherokee	1,414	2,209	-36.00	0.31	0.66		166,900
Picaso	1,129	0	-	0.25	0.00		209,800
Rex	984	701	40.37	0.22	0.21		46,000
Total	453,269	333,255	36.01	100.00	100.00		

Resources: HP of Related Companies (1 yuan=15 yen or 0.13US\$).

Foreign funded automobile manufacturers can be divided into two groups: first entrants and last entrants. First entrants include VW, GM and Honda, while last entrants are Toyota and Nissan. Among them, the leading automobile manufacturer of Europe, US and Japan, VW, GM and Toyota in addition to Nissan that has realized V shaped recovery are all full-line manufacturers, therefore whether or not each maker can serve full-line product is expected to be the center of competition when sever share competition occurs in the emerging Chinese market. Table

2 indicates primary automobile manufacturers' market share in 2002.

Table 2 Market Shares of Passenger Cars manufactured in China (2002)

Manufacturer	Sales {Unit} Growth Rate to '01 %	Market Shares Ratio of '02 to '01 j
1.S, VW	301,095(24.9)	23.8 (6.6 j)
2. FA, VW	207,858(66.4)	16.4(0.6)
3.S, FL	110,763(89.9)	8.8(0.4)
4.FAW-TAIC	95,433(35.7)	7.5(-1.3)
5.DongFeng-Citroen	85,088(60.0)	6.7(0.0)
6.Chang'an Suzuki	65,018(50.9)	5.1(-0.3)
7.Guangzhou Honda	59,151(15.9)	4.7(-1.7)
8.Saic Cherry	50,155(73.8)	4.0(0.3)
9.Geely	45,972(97.0)	3.6(0.7)
10.Fengshen (Aeolus) Auto	41,060(133.0)	3.2(0.0)
Passenger Cars in total	1,265,050 (59.6)	

Note: Including , 中国 Zhongguo Qiche Bao. (China Automotive News).

Resources :Nihon Keizai Shinbun (Japan Economic Journal).Feb. 4, 2003.

The biggest carmaker in China, VW has built the full-line system in two joint ventures located in Changchun and Shanghai to produce from luxury cars to low-priced compact and middle sized passenger cars. In Shanghai, the plant produces Polo (1400cc), Santana (1800cc), Santana 2000 (1800cc) and Passat (2800cc), and in Changchun, Jetta (1600cc), Bora (1600cc) and Audi A6 (2400cc/2800cc) are produced (see table 2). They also announced that in 2003 Shanghai plant would produce Gol (1600cc), Tuaran (MPV) and sedan-type Polo, and Changchun plant would additionally produce Golf and Audi A4, so total 12 models would be locally produced in China². As table 1 indicated, sales volume of VW in Chinese market is totally over 500 thousand; which means Chinese market becomes to be the biggest market in the world other than Germany for VW, having been more emphasized its strategic importance. VW has attempted to defend the top market share in China under the annual sales volume of over 600 thousand.

On the other hand, it was a strategic alliance with local major companies FAW and Dongfeng Auto that last entrants Toyota and Honda has

² Nihon Keizai Shinbun as of February 16, 2003

chosen. While detailed alliance will be described later, the quickest approach for implementing full-line is estimated to be the utilization of production and sales networks through local major carmakers to catch up with first entrants. GM has also deployed the full-line policy by increasing supply sites, and yet they have adopted not comprehensive strategic alliance but GM's favorite approach, M&A of the existing companies. Those corporate behaviors reveal each characteristic.

As a product strategy deploys, establishing efficient production logistics will be emphasized at the next stage. While excess supply brought by successive foreign capitals' advancement has come to the surface, many markdowns of car sales prices have been observed, and entrants have been forced to reinforce their competitiveness³. As indicated in table 1, tariff cuts due to WTO entry and local carmakers' low price strategy have gradually intensified price competition especially for compact cars and standard cars between local carmakers and foreign capital firms⁴. As precedents of consumer electronics clearly indicate that cost competition will presumably become a main issue of interfirm competition.

Consequently, in order to overcome a cost competition in automobile industry, many companies in China aggressively attempt to introduce Japanese production systems that are becoming a "global standard for manufacturing": the Toyota Production System (TPS) and the lean production. That situation has preferably allowed Japanese firms to get core competence and to be looked as a kind of brand.

Based on the above recognition, the next section discusses each company's competitive strategy by presenting strategic alliances of Dongfeng-Nissan, and FAW-Toyota. With reference to an introduction of the Japanese production system into China, the following sections focus on the transfer of the Toyota Production System to China and explain

³ In 2002, production capability of passenger car in China has reached totally about 2.2 million units, but the actual production volume was 1.09 million units and capacity utilization stayed at 50%. In 2005, production capability is expected to increase 4.5 million units, and there is concern that excess capability will happen.

⁴ In terms of price competition, for instance, China local passenger car manufacture SAIC Cherry announced price markdowns for all the existing car models in March 2003, and markdown ratio has reached around 15% in an average. In January 2003, Dongfeng Citron Motor also carried out substantial markdown on the core model Citroen ZX (local name:Fukang) by 18,000 yuan (1 yuan= 15 yen) and more.

the pattern of technology transfer of eastbound Toyota and westbound GM and Opel.

3. Strategic Alliance: Competitive Strategy of Dongfeng Motor, Nissan's Partner in China

In September 2002 in Beijing, the president of Nissan Carlos Ghosn and the president of Dongfeng (headquarters: Wuhan city, Hubei Province), the leading Chinese automobile manufacturer, Wei Miao announced that they agreed to discussion on comprehensive alliance between both companies. The alliance of both companies was the biggest comprehensive alliance in the history of the Chinese automobile industry, and, thus the Chinese Government intends to make this joint venture with Nissan recognized as new model of the automobile industry in order to fully support management reform of Dongfeng.

3.1 Business Alliance

In June 2003, Nissan and Dongfeng are going to jointly found Dongfeng Motor Co. Ltd., in Wuhan City, Hubei Province on a 50-50 basis. The new joint venture is capitalized at about 17.1 billion yuan (about 240 billion yen or 2 billion dollar) and Nissan invests 8.55 billion yuan (about 120 billion yen) for acquiring 50% of stock. The existing Dongfeng Motor transferred 70% of the present asset (equivalent to 8.55 yuan) to new company as capital investment.

Those two companies play their own roles in the following. Nissan provides new company with globally recognized brand power, technical skills, extensive product lineup, and management expertise (know-how on management such as Nissan Revival Plan, Nissan 180, etc.). Dongfeng Motor utilizes the brand name, consumer awareness, sales performance for commercial cars and provides the new company with production facility and sales network. Those two companies set themselves the goal of making the new company a competitive passenger car and commercial car manufacturer at the global market, and Nissan aims to ultimately get the third market share in China. The new company holds the "Dongfeng" brand and the "Nissan" brand, fostering them as the brand of the joint venture

As for a passenger car business, the new joint venture will found another 50-50 joint venture, a passenger car-manufacturing subsidiary in Guangzhou City, Guangdong Province with two production sites: Huandu plant of Fengshen Motor in the same city and Xiangfan plant of Dongfeng in Hubei. The passenger cars will be produced and sold with Nissan brand.

Fengshen Auto is a joint venture of Dongfeng and Nissan's Taiwanese subsidiary, Yulong Motor (60% of shares by Dongfeng and 40% by Yulong), currently producing Bluebird on a consignment basis. Fengshen Auto will be taken over by the new passenger car joint venture of Nissan and Dongfeng, while expanding the facility in Huandu plant to foster it as a core base of manufacturing Nissan brand vehicles. From 2003, the plant will produce Sunny and in addition Cefiro, Teana and so on, then by 2006, it will produce totally 6 models of passenger cars with full lineup. Xiangfan plant of Dongfeng will produce Bluebird.

Commercial car business will be consolidated into Shiyuan plant and Xiangfan plant of the existing Dongfeng Auto with production and sales for Dongfeng branded small sized commercial car, bus and truck

In terms of parts business, major operations of the existing Dongfeng's four parts affiliated companies and parts department will be taken over by the new company. Furthermore, passenger car R&D center will be newly established and commercial car R&D center will be founded and enhanced based on the existing Dongfeng R&D department.

On the other hand, Nissan's joint venture, Zhengzhou Nissan Auto produces pickup truck Datsun, and the company is going to launch a new model of sport-utility vehicle "Paladin" in China ahead of the other world markets. These car models will be sold with Nissan brand. The new company will not include Zhengzhou Nissan Auto.

Dongfeng Citroen Automotive Co. Ltd., (Wuhan City), a joint venture between Dongfeng and PSA, and Honda's two joint ventures, Dongfeng Honda Engine Co. Ltd., (DHEC, headquarters: Guangzhou City) and Dongfeng Honda Auto Parts Co. Ltd., (DHAC, headquarters: Huizhou City) will be separated from Dongfeng Auto.

Nissan will invest about 120 billion yen to the new joint holding company and additionally spend 20 to 30 billion yen in total for product development to Chinese market until 2006. Also, the company is improving

the sales network by increasing the number of vehicle sales bases from 50 to 300.

3.2 Dongfeng 's "Triple Jump Strategy"

Dongfeng-Nissan alliance is based on the long-term friendly relationship with Nissan Diesel. In the middle of 1980, thanks to Nissan Diesel's technical support, Dongfeng was able to implement Japanese production systems including "One-at-a-time" (ikko nagashi in Japanese) so that the company has built a trusting relationship with Nissan Diesel, and after that, the relation led to found a joint venture "Dongfeng-Nissan Diesel" (headquarter: Hangzhou City). Dongfeng was founded during the era of the Cold War when the Vietnam War broke out and China confronted with the Soviet Union. It was built in Shiyan City, Hubei Province in the mountain area of mid-China for a security and military reason under the name of Second Automotive Works (SAW) in order to serve First Automotive Works (FAW) located in Changchun City near the Soviet Union as a backup site. The bad geographical condition from the beginning of foundation had always driven Dongfeng away from the mountain area. The base of Dongfeng's corporate strategy is so-called "Triple Jump Strategy".

In this context, "Triple Jump Strategy" represents the relocation of the office: it started in Shiyan, then moved to Xiangfan City by way of Wuhan and at last is going to settle in Guangdong or Shanghai, just like jumping⁵. At coastal area, Shanghai was dominated by Shanghai Automobile Industry Co. (SAIC) and VW-GM so that Dongfeng has shifted to Guangdong where a technical base of automobile industry was relatively weak. Furthermore, Dongfeng built the Pudong parts production base in the Pudong district in Shanghai, and at present, Dongfeng has affiliated twelve joint ventures centering a foreign funded parts manufacturer that supplies parts to Dongfeng Citroen Motor, a joint venture of Dongfeng and PSA. A Japanese parts manufacturer is also included in the affiliated companies.

⁵ For more detail, see Chunli Lee, *The Chinese Automobile Industry: Evolution of Manufacturing System and Technological Strategy* (in Japanese), Shinzansha Publishing House, 1997

Complying with the "Triple Jump Strategy", Dongfeng transferred headquarters from Shiyuan to Wuhan, and additionally set up a brand-new joint venture. As described before, one of the new joint venture's plants for passenger car is located in Xiangfan City that lies between Shiyuan and Wuhan. Xiangfan City, however, has only a small airport for joint military-civilian use and is geographically away from Changjiang River so that the locational condition cannot always be said good from the view of logistics. Dongfeng consolidated the core business, passenger car business into Guangdong, which has a high potential of purchasing power. The main business is as follows:

- 1) Dongfeng Honda Engine = DHEC located in Guangzhou City
- 2) Dongfeng Honda Auto Parts = DHAC located in Huizhou City
- 3) Fengshen Auto in Guangzhou City that is a joint venture with Yulong Auto, Nissan's Taiwanese subsidiary
- 4) Newly founded passenger car manufacturing subsidiary to Nissan and Dongfeng (Guangzhou City)

The above two joint ventures of Honda, DHEC and DHAC were initially supposed to produce finished cars as a Dongfeng-Honda subsidiary. The project, however, was held up by Chinese Government policy for automobile industry that restricts new entry of passenger cars in 1990's so that the subsidiary could not help turning into an engine and engine parts manufacturer.

Dongfeng has dispatched their handpicked and elite young engineers and managers to joint ventures in Guangdong. The infrastructure of machine and automobile in Guangdong is comparatively weaker than those in Changchun and Shanghai, and this situation is another cause of Peugeot's withdrawal from Guangzhou City. After that, Guangzhou-Honda Auto, which had been able to advance finished car manufacturing, has relatively and steadily developed the business, because the company could successfully utilize Dongfeng's technique as well as Honda-affiliated parts makers' techniques from Wuyang Honda Motorcycle Co. Ltd., in Guangzhou. In fact, it is not too much to say that Dongfeng's technical capabilities have supported Guangdong area's technical foundation for machinery and automobile.

From the above process, the new joint venture for passenger car with Nissan can be regarded as the final stage of Dongfeng's "Triple Jump

Strategy" . Yet, all the passenger cars will be produced and sold with Nissan brand, so that Dongfen would play only a limited role. Since Dongfeng has had no experience of manufacturing passenger cars and no their own brand, the company has not so adhered to the own brand as FAW has; in a way, it's in the course of nature. Dongfeng, whose business has been sluggish since the middle of 1990's, can learn a lot from what and how Renault-Nissan alliance has restructured and revived, and three parties have relatively chemistry each other.

While promoting the comprehensive alliance with Nissan, Dongfeng signed new joint venture contract that includes the expansion of partnership with PSA group and the introduction of new products, and agreed on intensifying the joint business for passenger car.

The preceding partnership had agreed on producing passenger cars jointly with Citroen that is under the umbrella of PSA, based on Dongfeng Citroen Motor. Under the new partnership agreement, Dongfeng Auto is going to reinforce businesses of allied partners as a PSA group. First, a platform of the passenger car, Peugeot affiliated in the PSA group will be introduced to establish a system for mixing to produce two different brands. Moreover, Dongfeng Citroen Motor is founding to a R&D Center for passenger car in Wuhung, fostering their original research and development capabilities. Since 2003, the company will introduce new car models every year, totally 6 models. PSA has obtained increased investment from Dongfeng Citroen Motor and up the capital to 7 billion yuan (about 100 billion yen). The new joint venture will have the production department, and the sales department that sells Peugeot brand as well as Citroen brand respectively⁶. Through the series of consolidation and repositioning, Dongfeng's basic strategy has been identified gradually.

4. Toyota-FAW Strategic Alliance and the Toyota Production System

The strategic alliance of Toyota and First Automotive Works (FAW: headquarters is in Changchun City, Jilin Province) announced in August 2002 was the big project for alliance between the leading Japanese firm and Chinese firm in automobile industry alongside of the alliance

⁶ *Nihon Keizai Shinbun* as of October 26, 2002

between Sanyo and Haier in consumer electronics. Toyota, which aims to occupy 15% of the world share by 2010, China has been the only blank area. Thanks to the comprehensive alliance with the leading Chinese maker FAW, Toyota was able to build footing for the world strategy.

4.1 Business Alliance

At last, a comprehensive alliance between Toyota and FAW, which had been negotiated since the summer in 2002, was settled. On April 9, 2003 in Tokyo, Mr. Fujio Cho, the president of Toyota and Mr. Yangfeng Zhu, the president of FAW announced what they have agreed as described below.

- 1) Toyota will start to produce 30,000 cars of Corolla annually from the spring in 2004 at the existing first plant for passenger car where compact care VIOS (sister car model of Vitz = Yaris) had been produced since October 2002 in Tianjin City. Meanwhile, Toyota is going to increase local-production for compact car Vios from annually 30, 000 to 50,000 in Tianjin City. Vios has been in good demand from the beginning of its sales in 2002, and some models take almost a half-year to be delivered. The export to China was also increased to 47,000 cars in fiscal year 2002 from 12,000 cars in the preceding year. Toyota has invested approximately 100 billion yen to jointly build the second plant for passenger car with FAW to produce middle-class and luxury cars in Tianjin City, and thus, the plant will start operation from the spring in 2005 and produce 50,000 cars of Crown a year. From 2005, it will start production for middle-sized luxury car "Camry" .
- 2) With technical assistance from Toyota, Changchun Plant of FAW located in Jilin Province will annually produce 10,000 cars of sport utility vehicles (SUV), Land Cruiser by the end of 2003.
- 3) A joint venture, Sichuan Toyota Motor Co. Ltd. (STMC) in Chengdu City, Sichuan will also annually produce 5,000 cars of luxury SUV Land Cruiser Prado within 2003.
- 4) Tianjin-FAW Charade (the ratio of investment by FAW: 51%, the remaining by Tianjin Automobile Industry Co. (TAIC): 49•) started to produce conventional Charade and Platz, followed by Vitz (Yaris) locally manufactured since 2002.
- 5) Within 2003, a joint sales company is to be set up.

6) Toyota will support the development for a successor model to the FAW's luxury car, Red Flag. Daihatsu Motor of the Toyota group company plans to start a joint production for compact cars with FAW from 2005. Candidate models to be produced are "Mira" and "Move". Before this launch, Daihatsu is going to conclude a technical license agreement with FAW-Huali (the ratio of investment by FAW: 75%, the remaining by TAIC: 25%) to produce compact-sized SUV "Terios" from autumn in 2003.

The president of Toyota, Fujio Cho stated, "We are going to deepen our cooperation relationship in extensive areas from R&D, sales to services" and emphasized beginning a full-scale business in China⁷, attempting to locally produce 300,000 to 400,000 cars in a year by the year of 2010 and targeting 10% of market share in China by using cooperative relation with FAW as a leverage. Toyota has a plan for full-line production in China, aiming for annual production capability of 400,000 cars with maximum 6 models in 2005.

4.2 Origin of Strategic Alliance: Introduction of the Toyota Production System

The strategic alliance between Toyota and FAW has come true from a convergence of their future interest. Tracking an original idea of the strategic alliance tells you that the technical transfer of the Toyota's unique brand of the Toyota Production System (TPS) has remained as a significant contribution factor, but actually the fact is not so well known. Important players for the transfer of TPS have been FAW and TAIC that affiliated to FAW.

The introduction of the Toyota Production System can be divided into three phases.

1. First phase: Responding to invitations from FAW in Changchun, ex-vice president of Toyota, Taiichi Ohno visited twice in 1977 and 1981, not only holding seminars on the TPS but also coaching technical guidance at production sites. These events triggered a boom of TPS learning at the end of 1970's, resulting from Chinese firms' introduction of TPS ahead of Euro-US firms⁸.

⁷ *Nihon Keizai Shinbun* as of April 10, 2003 and June 6, 2002

⁸ In terms of the introduction of the Toyota Production System into FAW and technical assistances from Taichi Ohno and Hino Automobile, see the

2. Second phase: From late 1980's to early 1990's, with technical support by Hino that is affiliated to Toyota, FAW built a plant for transmission as a model plant of the Toyota Production System, and implemented a systematic Just-In-Time system for the first time in China (however, it was tentatively suspended).
3. Third phase: Toyota has hold "TPS Seminars for China" annually since 1996. The earlier seminars were held in Japan, but as the local production in Tianjin has been stepping up, the seminar has come to hold in Tianjin.

Not only Toyota's partner firms such as FAW and TAIC but also a part of another Chinese automobile related companies are allowed to attend the "TPS Seminar". Thanks to the plant building in Tianjin by Toyota group companies and Toyota-FAW strategic alliance, TPS implementation has moved into high gear to make systematic, organized direct technical transfer feasible. Following Taiichi Ohno's footsteps, Toyota engineers are said to have taken to FAW for coaching production management since 2002.

4.3 Toyota's "TPS Seminars for China"

(1) V-shaped advancement - Back-office started in advance

Toyota has taken more unconventional tactics for moving into China than ever their world businesses, and has set many precedents.

- 1) Parts suppliers in Toyota group had entered into China before Toyota started local production for finished vehicles.
- 2) Before full-fledged vehicle production started, coaching for production management (Tianjin) had started, an automobile school (Beijing) and a skilled worker training center (Shengyang, Gold

following two references for more details. Here, the details are omitted. Chunli Lee, "Technology Transfer of the Toyota Production System in China", in Haruo Horaguchi and Koichi Shimokawa eds., *Japanese Foreign Direct Investment and the East Asian Industrial System*, Springer Verlag, 2002; Chunli Lee, "Adoption of the Ford System and Evolution of the Production System in the Chinese Automobile Industry, 1953-93", in Haruhito Shiomi and Kazuo Wada, eds., *Fordism Transformed: The Development of Production Methods in the Automobile Industry (Fuji Conference Series I)*, Oxford University Press, 1995.

Cup) had started, and Japan-China joint survey on car sales, installment sales and parking had been conducted. The TPS Seminar for China has been held a part of the activity.

3) New workers (new employees of a joint venture) had started production for brand new model (Vios) at a new plant (joint venture in Tianjin). It was also unprecedented for Toyota. A model to be produced overseas is to be usually produced at a plant in Japan, or the model for overseas only is to be produced at some of the existing overseas plants.

In this way, it is called as a "V-shaped" advancement that a reverse order such as back-office processes (parts manufacturing, production management, sales/services, etc.) is prior to production of finished cars. Ordinary order should be the reverse, that is to say, production of finished car is prior to parts manufacturing and sales, "reverse V-shaped" advancement is usual.

(2) A Case Study of "TPS Seminar for China" (1st seminar held in Japan)

The first "TPS Seminar for China" was held at Toyota head-office located in Toyota City in November 1996. Toyota's Chinese specialists and Production Research Division, which specifically facilitates TPS, had promoted the meeting: it constitutes one-week seminars and plant tours. The summary is as follows:

Table 3. Summary for "TPS Seminar for China"(I) (1st Seminar held in Japan)

•Agenda: Basic Idea of the Toyota Production System (history, detailed solutions, etc.)
•Toyota Takaoka Plant Tour (to learn the process of vehicle production)
•Toyota Boshoku Head-office, Plant Tour (to learn the Just-In-Time production)
•Araco Sanage Plant Tour (to learn the production with "tact time")
•Lecture by a Professor under the title of "The Toyota Production System in Corporate Management"
•Preparation: A tutor (top management of Toyota Production Research Department) visit trainees' companies in advance, coaching some actual problems that people at operation site hold. Actual problems are instructed to hold at operation site, being incorporated into the seminars.
•Attendees: Top management from FAW, TAIC, Dongfeng Motor, and Shenyang, academic researchers and administrative officers from Tianjin University, Shanghai Jiaotong University.
•Feedback: A meeting is held annually by OBs who attended TPS Seminars to have annual conference. Trainees have already come to be affiliated companies' vice president, or line

leaders level (see Tianjin).
•Documentation: Chinese affiliated companies have utilized Materials for the TPS Seminars as a manual for new employees.

Source: Chunli Lee

(3) A case of "TPS Seminars for China": Kaizen Presentation at a joint venture in Tianjin

The "TPS Seminars for China" have been annually held in Japan for three times and after that, the meeting has come to be held in Tianjin since 1999 as Toyota group's production has begun a full-scale. Table 4 shows a part of summary for the seminars held in Tianjin Denso.

Table 4. Summary of "TPS Seminar for China" (Kaizen Presentation at a joint venture in Tianjin)

•Host company: Tianjin Denso Electric Machine, formed in 1995
•Ratio of Investment: China 51 • and Japan 49•
•Major products: Alternator, motor scooter
•Tianjin Denso hosted the 7 th "TPS Seminar for China" held in July 2001.
•TPS support expert: Dispatched from Head-office to stay about 6 months in China and to coach at production site. Japanese residents: three
•Training at Japan: 24 workers in a month were dispatched to head-office plant, which is a mother plant for Tianjin Plant. Dispatched are mainly section leaders who take charge of quality control and maintenance.
•Tianjin Toyota Kyoho liaison meeting and Kaizen presentation: Chinese staffs make presentation at production sites. Presentation is carried out in Chinese but presentation materials are prepared in Japanese. Top Management of Toyota Production Research Department and peoples in charge of TPS attend the meeting to provide with coaching. All staff members from TIAC affiliated companies attended. The TPS Seminars in Tianjin have been open to China since 2002, and partly affiliated companies have come to be available to attend the meeting with some admission fee.
•TMTC (Toyota Motor Technical Center China): The center provides TAIC with technically and administratively consulting and advice. Some experts provide parts supplier with technical supports and production management.

Source: Chunli Lee

Japanese firm's involvement in corporate management will make it feasible to commit to long, organizational introduction of TPS. At a time when the supporting system by head-office had been established,

the following have been institutionalized: providing training at a mother plant, dispatching TPS support experts, technical assistance from automobile makers, proliferation of Kaizen activities and training local staffs. It is essential for foreign capital to involve in corporate management of Chinese firms to promote full-fledged TPS.

The seeds of TPS sowed at FAW in Changchun 25 years ago by Taiichi Ohno, who was born in Dalian City in China, bloomed in Tianjin and Changchun later, becoming a foundation of comprehensive strategic alliance of Toyota and FAW at the beginning of 21st century. It has been a kind of byproduct from Chinese firms' mind-set, "When you drink water, you should remember a person who dug a well".

5. Westbound Transfer of Technology: Introduction of Lean Production and Strategic Alliance at Shanghai GM

It is not only Japanese firms by which Japanese production systems as represented by the Toyota Production System and the "Lean Production System" are transferred to China. Actually, the "Lean Production System" promoted strongly by non-Japanese firms such as GM and Opel has shed new light on conventional discussions for international transfer of Japanese production systems.

5.1 GM Group Strategy to China: Group DynamicsThe GM group has advanced their alliance by the different way of Japanese firms. That is not a comprehensive business alliance but a strategy of taking over prime businesses through M&A that emphasis with financial ties. GM has aggressively taken over firms and invested in related companies since the latter half of 1990's.

Table 5 Alliance Relationship of the GM Group

□Alliance partner (minority investment): Isuzu, Suzuki, Subaru, Fiat
□Partner (majority investment): GM Daewoo
□Joint venture (equal investment): Shanghai GM, Gold Cup-GM, □□□□ etc.
□Wholly owned subsidiary: SAAB, Opel, Vauxhall, Holden (the last three were owned before 1990's)
□US department: Chevrolet, Pontiac, Oldsmobile, Buick, Cadillac and Saturn

Source: Hiromi Shioji, *The Present Situation and Challenges of the Marketing* pp. 68 in "Survey of Automobile and Related Industries in China,

published by Gendai Advanced Studies Research Organization, 2003

In China, GM has two joint ventures: Shanghai GM (car models: Sail, Buick, etc.) and Gold Cup GM (headquarters: Shenyang, car model: Chevrolet Blazer S10). A typical example of GM's alliance is the capital participation to Korean Daewoo. The controlling share of the GM group is as follows:

GM 42.1% + Creditor banks to Daewoo 33% + Suzuki 14.9% + SAIC 10%

A new company named "GM Daewoo Automobile Technology" has been founded, and then, shareholding companies take the own role as like this: development by GM/Suzuki, production by GM Daewoo, considering if Shanghai Automobile Industry Co. (SAIC) will locally produce some car models of GM Daewoo. SAIC will invest 5.97 million dollar (about 7 billion yen) and become a big shareholder of GM Daewoo so that the company would learn the GM's or Suzuki's development and production technology, management and factory administration, and moreover, it is said that it aims to standardize some parts in the future⁹. This is the first case that Chinese automobile manufacturer invests to foreign firms.

GM plans to consign Shanghai GM to produce a new model "J200" succeeding to middle-sized car "Nubira" jointly produced with Korea Daewoo, and to sell the model in the Chinese market through Shanghai Auto's sales network after bringing the model to the market by the end of 2003. The "•200" is the car model which competes with Volkswagen's Santana and Citroen ZX, and the necessary parts for local production in China will be, at this moment, procured through the existing Chinese production site such as Delphi.

In China, Shanghai GM plans to make the Shandong base of Daewoo (Yantai City, Shandong Province) bring a Corsa-based new model Sail to the Chinese market Daewoo agreed in 1997 with Shandong Local Government to jointly build parts supplying plants including an engine plant with annual production capacity of 300 thousand units, while investing 7 billion yuan (about 100 billion yen) in total to three cities: Yantai City, Qingdao City and Weihai City. The project was almost deadlocked due to the Daewoo's business failure, but after that, in Yantai City

⁹ *Nihon Keizai Shinbun* as of October 12, 2002

a few firms including Yantai Automobile Industry Co.(YAIC) jointly invested 1.44 billion yuan(about 2.1 billion yen), succeeding the project to produce a small-sized car "Daewoo Lanlong"¹⁰.

Besides Daewoo, Isuzu affiliated to GM plans to jointly produce heavy duty truck in China with GM in 2003, aiming at the year of 2005 to increase production volume of truck in China to 70,000 units by 70% up from now. A joint venture Qingling (Chongqing Isuzu Auto) located in Chongqing City will annually produce 10,000 units of heavy-duty diesel truck whose carrying capacity is 8 tons. The company transferred to Subaru the all amount of capital invested (49%) to a joint venture in the US, Subaru-Isuzu Automotive (SIA, Indiana), withdrawing the production of finished car from the US market where their business is sluggish. The president of Yoshinori Ida emphasized in his speech on corporate rehabilitation that they would bet on China for the last chance from now on¹¹.

GM has spent money not only to foreign capital but also to local capital of excellent commercial car manufacturer Shanghai Wuling Auto (Liuzhou City, Guangxi Province) affiliated to SAIC for 30 million dollar (about 3.6 billion yen). The controlling share to the new company is as follows:

SAIC 50.1% + GM 34% + Liuzhou Wuling 15.9%

The new company is going to invest 2 billion yuan (about 30 billion yen) for the coming ten years, developing and producing commercial cars mainly small-sized wagon targeting to rural areas. For GM, the company will become the fourth production base followed by Shanghai GM producing passenger car, Yantai Auto and Gold Cup GM producing recreational vehicle¹². If the joint venture with Isuzu goes on well, the fifth production base would be presumably built.

In this way, GM has exercised fully its advantage of the GM group in the Chinese market. GM, however, has a weakness. First movers VW and Japanese firms, Toyota and Honda have systematically and rapidly accelerated the full-line implement for car models to produce. In case of GM, the weakest points are: "In the future, casting new car models seems not to be agile, while implementing systematic full-line," and "Conflicts of interest have come to make each manufacturers take longer

¹⁰ *Nihon Keizai Shinbun* as of October 25, 2002

¹¹ *Nihon Keizai Shinbun* as of October 26, 2002

¹² *Nihon Keizai Shinbun* as of June 10, 2002

time to fix"¹³.

At any rate, GM aims to see the Chinese market as an extension of the global strategy. Moreover, Shanghai Auto also includes the partnership with Daewoo and Wuling Auto beyond the Shanghai area. In terms of consolidation and positioning, and strategic alliance, Shanghai Auto has similar flexibility to GM. These kinds of practices seem to manifest good partner's suitability between Chinese and US firms.

5.2 Introduction of Lean Production into Shanghai GM

While GM's business behavior in China takes over the US "GMism" in terms of interfirm strategic alliance, they have faithfully adopted the lean production into the production management. At the process of introducing the lean production, it should be highlighted that a mother plant was assigned not to the US GM but to their Germany subsidiary Opel. The summary is described as below.

¹³ Hiromi Shioji, *The Present Situation and Challenges of the Marketing* pp. 68 in *Survey of Automobile and Related Industries in China*, published by Gendai Advanced Studies Research Organization, 2003

Table 6. Introduction of Lean Production into Shanghai GM

Shanghai GM: Founded in June 1997
Controlling Share: 50% : 50%
Production Model: Buick (3000cc), Sail (1300cc, Opel and Corsa bases)
Resident Officer: The number of staff dispatched from GM is about 40. Not only American but top-class personnel selected from the GM group world widely are dispatched to Shanghai GM. Some China resident officers have a working experience at NUMMI.
Mother plant: Eisenach plant of Opel is a model plant of lean production. Opel has the "International Project Center" which instructs a construction and set-up of a plant, and trains human resources.
Why Eisenach plant is a mother plant: The lean production is advanced at Opel rather than US GM. Chinese employees are cooperative and conscientious. In the US, labor unions have a power too much.
Where trainees to dispatch: Eisenach plant of Opel accepts the most, followed by GM's Holden plant in Australia and Zaragosa plant in Spain. Most group leaders and section leaders of Shanghai GM have been trained overseas. However, it is not well known that the concept of the lean production originates from Japan.
Result: Shanghai GM acquired ISO14001 in 2000. The GM group is planning to make Shanghai GM a model plant of the lean production.

Source: Chunli Lee

A staff, who had diligently introduced the lean production and experienced a lot about it in the GM group, has been in Shanghai GM to exercise his leadership in there. In-plant production management is thoroughly carried out as described in the textbook of the lean production system, and the cutting edge equipment has been implemented. Yet, comparing with such a brand-new system, workers show relatively rough motions and look hard to deal with it. On the other hand, they currently produce two models of car, Buick and Sail only, and the production volume in 2002 was 54,695 cars and 56,928 cars so that it should be concerned about depreciation of facility rather than high-mix low-volume production. Shanghai GM has totally invested 152.1 million dollar (about 180 billion yen), which represents the biggest project between China and US even now from the view of investment scale, and the project has become a symbolic presence of Sino-US economic cooperation.

The "Lean Production System" facilitated strongly by non-Japanese

firms such as GM and Opel has contributed to the transfer of Japanese production system so called "Global Standard of Manufacturing" to China by a different way from what Japanese firms did. This situation implies that the technology has been universally and globally transferred far beyond the nationality of firms: Japan and China. In this way, the transfer of the Japanese production system to China can be divided into two big trends: the eastbound transfer via Japan (Toyota and Honda) and the westbound one via US and Germany (GM and Opel).

6. Tentative Conclusion: International Comparison of China vs. Japan, Korea, Europe

So-called "bilateral view" is required to look into the Chinese economy: it means you should verify both of its forwardness and backwardness. The view is also essential to observe the growth of Chinese manufacturing industry. This section compares Chinese manufacturing industry with the related industries in Japan, Europe and Korea to identify the present achievement of Chinese economy, presenting a tentative conclusion.

First, in the automobile industry, the capacity of production of China is 3.25 million cars in 2002, which is equivalent to that of Japan in 1967 (3.15 million cars) and that of the former West Germany in 1975 (3.19 million cars). China has exceeded Korea's capacity, being ranked fifth of the world, at the meanwhile, Korea has retreated to the 6th rank (3.15 million cars). China has come to reach the top 5 of the automobile manufacturing giants in the world.

French production capacity ranked fourth is 3.38 million cars, which will be overtaken by China, is regarded as certain thing. Thus, the following world ranking is becoming more likely: At the top is the U.S. (12.27 million cars), followed by Japan (10.26 million cars), Germany (5.48 million cars) and China. Actually, although the international sales ranking shows China took seventh place (2.38 million cars) in 2001, China has picked up pace to achieve the fourth place (3.25 million cars) and gone past Italy (2.57 million cars), France (2.61 million cars) and the U.K. (2.89 million cars). China has increased the production by 0.9

million cars in a year and boosted sales by 0.87 million cars, making a strong impression of the advent of motorization on other countries.

Meanwhile, the other important index, production volume for passenger car highlights the other side of China. Production volume for passenger car in China in 2002 was 1.09 million cars, and it is equivalent to that of U.K in 1985 (1.05 million cars), France in 1960 (1.16 million cars), Italy in 1965 (1.1 million cars) and Korea in 1991 (1.16 million cars), and yet it is not so closely equivalent but to Japan in 1967 (1.38 million car)¹⁴. That is to say, total production volume took the fifth place in the world but production capability for passenger cars is almost equivalent to the 1960's level of Japan and Europe. Even in comparison with Korea, total production volume turned the tables on them but China has been 10 years behind in terms of production for passenger car¹⁵. Furthermore, Chinese ratio of export, the other important critical index, is negligibly small, and is way out of Korean and other advanced countries' league.

Breaking down a type of car reveals that 3.25 million cars, the total production volume of China in 2002 consists of one-third by truck (1,096,000 cars), one-third by bus (1,064,000 cars) and the remaining one-third by passenger car (1,091,000 cars). While the world trend is to produce passenger car, under the circumstances of the China's No. 5 position in the world, it is clearly emerging that the fact is China produces commercial cars such as bus and truck up to two-third of total production.

The ratio of production capability for passenger car in Japan had reached one-third (38% = 878,000 cars) to total production volume

¹⁴ In Japan, total production volume and production capability for passenger car are as follows: in 1966: 2,286,399 cars in total (877,656 cars for passenger car), in 1967: 3,146,486 cars (1,375,755 cars), in 1968: 4,085,826 cars (2,055,821 cars), in 1969: 4,674,932 cars (2,611,499 cars). You can see these figures of China in 2002 (3,250,000 cars in total, 1,090,000 cars for passenger car) are almost equivalent to those of Japan in 1967.

¹⁵ Total production volume and production capability for passenger car are: in 1987: 79,209 cars (793,125 cars), in 1988: 1,082,581 cars (872,074 cars), in 1989: 1,127,995 cars (871,898 cars), in 1990: 1,320,949 cars (986,751 cars).

(2,286,000 cars) in 1966 when the year was called as "the first year of the owned car era". As is well known, the Japanese motorization had entered into the full-scale level at the time of the Tokyo Olympic Game in 1964 and the Osaka Exposition in 1970. Korean motorization is generally said to start from the late 1980's. Especially, in 1988 when the Seoul Olympic Game was held, production for automobile in Korea had reached 1.08 million cars over a million units (872,000 cars for passenger car) and the export rose to 58,000 units, so Korea attracted international attention.

In China, the year of 2002 should be called "the first year of the owned car era". Because comparing some primary indices (i.e. production capability, the ratio of production for passenger car, etc.) of China with those of Japan in the supply side brings the conclusion. In Japan, the production volume increased from 2.29 million cars in 1966 to 3.15 million cars in 1967, bringing about a net increase of 860,000 cars, and production volume for passenger car increased from 880,000 cars to 1.38 million cars, bringing about a net increase of 500,000 cars. On the contrary, in China, the total production volume increased from 2.35 million cars in 2001 to 3.25 million cars in 2002, bringing about a net increase of 900,000 cars, while production volume for passenger car increased 700,000 cars to 1.09 million cars with a net increase of 390,000 cars.

In the demand side, the automobile industry is supported by consumer demand which public and private demand has shifted to. The tariff reduction for imported car and markdown of domestic passenger car due to the WTO entry have stimulated potential demand to change a substantial market, accelerating the advent of owned cars. There is also an empirical hypothesis that at a time when GDP per capita exceeds 3,000 dollar and over, full-fledged motorization will start. In case of China, GDP per capita in 2002 was 963 dollar yet, but in some urban cities, it has already exceeded 3,000 dollar and over¹⁶. The eastern coastal area preceding type, so called "1% of motorization theory" seems to be likely substantiated in some parts¹⁷. In China, the full-scale

¹⁶ In 2000, GDP per capita is 5,000 dollar and more in Guangzhou, 4,500 and less in Shanghai and 3,555 dollar in Beijing.

¹⁷ The "1% of Motorization Theory" is that if only 1% of the total population of China (about 1.26 billion) obtain an automobile in advance,

motorization is expected to start before the Beijing Olympic Game in 2008 and the Shanghai EXPO in 2010.

Now then, a question is if a gap of 30 years and over exists between the Japanese and Chinese industries when tracking the history of industrial development.

Consumer electronics shows good examples. Despite it may cause misleading, when summarizing the industrial history roughly, the master of invention Edison initiated the US consumer electronics industry about 100 year ago or more, and the Japanese consumer electronics industry has advanced in earnest since the World War II and has established the "Electronics Country" for 50 years and more; Korea has grown rapidly since the 1980's for over 20 years, and Chinese consumer electronics industry has come to increase the international competitiveness since 1990's and it has taken almost 10 years to grow up to the international level.

These international comparisons indicate that the life cycle of industrial development has been shorter and shorter. The Chinese industrial development has not been able to deviate from the argument, and viewing in the long run, China has been in a process of "compressed growth" so that a gap between Japan and China will tend to be shorter than 30 years. From the view of the fierce competitions and strategic alliances between Japanese and Chinese firms in the consumer electronics industry discussed in this paper, the dynamism of industrial development and the gap between Japanese and Chinese industries have seemed to be minimized. The "Advantage of Backwardness" theory by A. Gerschenkron has supported the argument¹⁸.

In Japanese industries, it is said in general "Consumer electronics industry has preceded by 10 years". In observing Japanese firms' international competitiveness and overseas advancement, it is a kind of effective index. The same thing can be possibly a kind of effective

the number of cars will be comparable to the annual production volume (12.27 million cars in 2002) of the US that is No.1 automobile manufacturing country in the world.

¹⁸ "Advantage of Backwardness" is differently called as "latecomer's advantage". It is an empirical rule found by Gerschenkron. In general, since developing countries introduce new technology developed by advanced countries, while promoting industrialization, the developing countries' advancement of technology will potentially grow rapidly, thus, the economic growth ratio will also show higher than those of advanced countries.

reference axis, in observing the Chinese industrial evolution. Currently, production for passenger car in China has mainly depended on foreign capital, but local manufacturers for passenger car have partially entered into the market from a low-priced market, causing cost competition. Low-end and low-priced passenger cars have been tracking partially the same route as consumer electronics and auto-bicycle industries' evolution¹⁹. Whether those local makers may vapor as a "bubble maker" through turbulent torrents of dashing automobile manufacturers from advanced countries to Chinese market, or may survive as consumer electronics and auto-bicycle manufacturers to confront with them into a new stage, or may conclude new partnership agreement with foreign funded firms; their actions will prove to be a decisive test in forecasting the fundamental power and durability of Chinese manufacturing industries.

¹⁹ Concrete discussion on local manufacturers for passenger car will be given in other occasion. See Lee, Fujimoto, Chen, "Trends of Open Product Architecture and Internationalization of Private Companies in the Chinese Automobile Industry", Discussion Paper for International Motor Vehicle Program (IMVP), MIT, August 2002.