

Chapter 2

Interaction between Transnational Corporations and Industry Clusters in China: The Case of Automobile Industry

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1. Introduction

Industry clusters are recognized as playing a significant role both in regional economic development and growth of transnational corporations (TNCs) in the globalization context (Porter, 1998; Barrell & Pain 1999; Head, Ries & Swenson, 1995). In China, industry cluster is the interaction ground of governments' industry policy and TNCs' foreign direct investment (FDI). It is well known that industrial policy and FDI utilization are two main wheels for the Chinese economic development and growth in the past thirty years (Jiang, 2002).

One remarkable mechanism for economic development in China is to attract FDI into industry areas, such as special economic zones (SEZ), economic and technological development zone (ETDZ), high and new technology industry development zone (HNTIDZ), export processing zone (EPZ) and etc. FDI contributions to the host economy listed by Dunning (1993) are obvious in China. Sustainable increasing FDI contributes greatly not only on the trade, employment and fiscal revenue, but also on the industry upgrading. Especially, so many "zones" lead to industrial clustering and regional economic development in coastal area of China. Industry clusters mainly centre in Pearl River Delta, Yangtze River Delta, ring Bohai Sea Gulf and the south of Fujian Province area. Some specialized industry clusters also emerged and got well known, such as electronics clusters in Dongguan and Suzhou, automobile clusters in Shanghai, Guangzhou, Beijing and Tianjin.

On the standing of foreign investors, when they decide the location choice in China, well constructed infrastructure and beneficiary policies such as cheap land and labor forces, favorable tax have ever been the attractive factors. Then there emerged a convergence of the regional governments' FDI policies. After the WTO access, beneficiary policy to FDI in China has been treated as a super national treatment and has been withdrawn since 2008. At the same time, Well-established industry clusters became an increasing important factor for foreign firms when they decide the location

choice. Especially under the globalization of TNCs activities and the increasing linkage between Chinese and world economies, industry clusters became more attractive than general industrial zones. Therefore, after the WTO access in the end of 2001, in the new round of FDI utilization in China, local government having been paid more attention on the formulation of industry clusters rather than beneficiary policy (Li, 2005; Xun, 2006).

In the early age of FDI attraction, as the quantity of FDI has ever been one of the key figure for local governments' political performance, they tried to attract FDI without attention on quality. This kind of FDI policy carried out the heavy flow of low quality FDIs and the negative externalities in China. Now China are bearing huge pressure and cost to overcome the negative externalities. Recently, learning the lessons in early stage of FDI utilization, China government tried to improve the quality of FDI and update the industry structure through more well-designed industry list to guide the FDI. Under central government's guide list, sub level governments (provincial or municipal) formulate economic development plans through so-called five year plans or midterm/long-run economic/industrial development plans, in which industry clustering and qualified FDI utilizing are main mechanisms for regional economic development and competitiveness improvement.

Interaction between TNCs and industry clusters has been an interesting and critical issue for policy makers and academicians. A few but increasing literatures on it contribute a lot for policy makers and academicians to understand and apply cluster theory and approach (Ren 2007; Wang 2007). However, it is still a question that how to promote win-win interaction between TNCs' FDI and industry clusters. More in details, in the Chinese context, how do the TNCs construct the supply chain in the industrial clusters? How do TNCs contribute to and benefit from the industry clusters and regional development through FDI? How do industry clusters contribute to and benefit from TNCs' FDI? Are there any deference among deferent original TNCs (such as TNCs from Japan, Korea, Great China, or USA and Europe)?

This study will try to answer the questions focus on the interaction between TNCs and regional industry clusters in China. In China, there are two kinds of industry cluster patterns: one is the market-created cluster, such as those specialized markets-created industry clusters in Zhejiang province; another is the policy-conducted industry clusters, such as those development zones that pulled by foreign and domestic investments. As

the Chinese economic development has been driven strongly by the government's policy and FDI, the latter cases of the industry cluster are more popular than the former one in China. Therefore, this paper focuses on the latter case.

For this purpose, this paper selects the automobile industry as the case. Automobile industry is a wide spread one in China. Automobile manufacturers distribute not only in Pearl River Delta area, Yangtze River delta area and Bohai Sea Rim, but also in many in-land provinces. Recently, rapid increasing demands for automobile products and encouragement policies make the automobile industry a attractive field in many local governments' regional development strategies. For example, in order to improve the regional competitiveness and FDI utilization's quality, many local government (provincial or municipal), such as Shanghai, Guangdong, Jilin, Zhejiang, Jiangsu and Anhui, emphasized the industry clusters' role in their automobile industry development plans. At present, automobiles are manufactured in 27 provinces/metropolitans. In China, over half of all the provinces selected automobile industry as the strategic key industry in their 11th five year plans and attracted auto makers to invest through beneficiary policies on the industry clustering. In China, although there are many automobile industry clusters classified by deferent dimensions, and Changchun where FAW locate is the largest automobile production base and Guangzhou where the Japanese car makers entered is the emerging cluster, Shanghai where Volkswagen and GM entered is the most advanced one for clustering.

This paper tries to answer the above questions as follows. Firstly, a theoretical framework is set up in section 2. The interdependent model of regional cluster and TNCs proposed by Enright(2000) are applied, then in section 3, we investigate the evolutionary of the automobile industry clusters in China and describe the interaction status between TNCs' FDI and industry clusters. For further dynamic finding, in section 4, Shanghai automobile industry cluster is studied, through which Volkswagen and GM are the main players as the TNCs, SAIC are state-owned indigenous player and cooperator for these two foreign TNCs. Then in section 5, we analyze the interaction of TNCs and industry cluster according to the interdependent model. Finally section 6 concludes the study and show implications.

2. Literature Review and Theoretical Framework

2.1 Literature Review on Interaction between Industry Clusters and TNCs

Studies on industrial clustering date back to Marshall's (1922) contribution on localization economies, Isard (1960) expanded this concept using the export-oriented industries and its linkages to other industries in the region, and since then many generations of academics such as Krugman (1981), Piore and Sabel (1984) closely studied this phenomenon, Porter (1990) popularized the concept of industrial clusters and then (Porter, 1998) defines clusters as "geographically proximate group of companies and associated institutions in a particular field, linked by commonalities and complementarities". However, small and medium enterprises (SMEs) rather than TNCs have ever been the main study object for a long period.

In the literatures on relationship between FDI and industry clusters, cluster's affect on FDI's location choice are the main stream (Barrell & Pain 1999; Head, Ries & Swenson 1995). Interaction between TNCs and industry clusters became an emerging research field only after the mid 1990s. Trends of globalization and regional economic bloc since 1990s' promoted the interaction between regional clusters and TNCs' FDI strategies. TNCs increasingly are using the logic of clustering in their FDI location choice decisions (Enright 1998a). Some place complete product mandates or business-unit headquarters into particular locations (Birkinshaw 1996). Others carefully arbitrage differences in locational sources of advantage on an activity-by-activity basis. This kind of interaction phenomenon have led to a small but growing literature that views the strategies of TNCs and the development of regional clusters as interdependent.

In the literatures of industry cluster study in China, small and medium enterprises are also the main object (Wang, 2001; Liang, 2004). In the five categories of clusters classified by Wang (2001), development zone where FDI plays key roles is classified as the fourth category. Although there is a lot of literatures on relationships between FDI and industry clusters in China, industry cluster's role on FDI's location choice has been the main stream (Liang 2003; Wang & Xu 2005). With the increasing affects of FDI on the industry cluster, interaction approach has been introduced as a new perspective on the TNC study (Xue and Ren, 2005).

Recently, there are a few studies on the interaction between industry clusters and TNCs in China, where clusters in Yangtze River Delta Region and Pear River Delta Region or specific clusters in Jiangsu, Zhejiang, Guangdong provinces are studied. Through a case study on the innovation network in Dongguan industry cluster of

Guangdong province, Tong and Wang (2000) analyzed the export-oriented manufacturing clusters and points out global linkage's improvement role for firms' local innovation network. Zhu (2002, 2004) studied the relationship between FDI clustering and regional economic growth through studies on the case of Yangtze River Delta region, and analyzed the clusters' affect on FDI's location choice decision. In the study on the cases of Kunshan and Jurong in Jiangsu province, Xue and Chen (2003) finds out the positive affect of FDI in the formation of cluster and argues that FDI's clustering life could spur the emerging of industry cluster. Liang (2004) investigates the FDI's affect on regional industry cluster and emphasizes that the sustainable enlargement of FDI's can improve the specialization level of production in the industry cluster. Ru (2005) analyzes the premise, affect and evolutionary pattern of FDI-based industry cluster and argues that vertical FDI flow is the premise of the FDI-based industry cluster, path dependence on location choice and existing vertical production network 's duplication or extension in the host country copy lead to the formation of this kind of FDI-based industry cluster. Fang and Zhang (2006) focused the case of industry clusters development in mid 1990s in Yangtze River Delta area and explored the background and evolutionary pattern of the TNCs-based industry cluster. Ren (2005; 2007) studied the interaction relationships between TNCs through case studies on the electronic industry in Suzhou of Jiangsu province. Wang (2007) contributes on the interaction between TNCs' strategy and industry cluster through the co-evolution perspective (Rodrigues & Child 2003; Jacobides & Winter 2005).

Local government also tried to search for new direction for the development zones. Interaction between development zones and TNCs has been studied jointly by policy makers and scholars. Under the National Science Foundation project researched jointly by the Shanghai Caohejing Development zone and Tongji University, they studied the interaction relationship between development zones and TNCs and published three books in China. The third book focused the case of Caohejing development zone and researched the core competence of the development zone and strategies (Chen, 2005). On the automobile industry cluster in China, Akifumi (2008) studies the Guangzhou case exactly through the flowchart model of cluster policy.

2.2 The Interdependent Model of Regional Cluster and TNC

Regional clustering refers to the development of multiple firms in the same or closely

related industries in the same location. In the large literature on regional clustering, two basic models of cluster-based development have emerged. The first views clusters as a form of organic economic development in which local firms interact and then inject themselves into international markets (Porter 1990; Piore and Sabel 1984; Pyke et al. 1990; Scott 1992, 1998; Storper 1992). The second focuses on the inability of peripheral regions to generate clusters of their own and their apparent need to attempt to develop local economies around the facilities of foreign multinationals (Arvin and Robins 1990; Arvin and Thrift 1994b, 1994c; Cooke and Imrie 1989; Young, Hood, and Peters 1994). In the former cases, regional development is seen as largely independent of the contributions of TNCs, whereas in the latter cases it is seen as dependent on attracting the facilities of foreign TNCs.

Besides the dependent and independent models of the regional cluster development, interdependent model is a third one in which foreign TNCs play a critical role in the cluster, and location in the cluster plays a critical role in the strategy of the foreign TNCs. This model is suggested by a stream of literature (Dunning 1998a, 1998b, 1999; Birkinshaw and Hood 1998; Enright 1999) that focuses on the interaction of regional clustering with the strategy of TNCs, it has been developed by Enright (2000).

Birkinshaw and Hood (1998) concluded that foreign subsidiaries located in regional clusters make greater strategic contributions to the parent company than subsidiaries that are not located in clusters. Dunning (1998a, 1998b, 1999) has incorporated discussions of clustering into the location portion of his "OLI" framework. In these literatures, he has identified clusters as an important variation on the geographic or location-based advantages that influence international production, his focus has been on the impact of clusters on TNCs.

Enright (1998a, 1999) has claimed that there can be important synergies between regional clustering and the strategies of foreign TNCs. Finally, whereas Enright (1999) described clusters that are dominated by local firms, foreign TNCs, and mixtures of the two as "organic," "transplant," and "hybrid". Birkinshaw and Hood (2000) examines the impact of foreign investment on the evolution of industry clusters and proposes that FDI has a mostly positive impact on cluster upgrading but presents some risks, particularly when the cluster is question has low dynamism.

Enright (2000) has focused on the interaction between regional clusters and multinational enterprises. Based on discussion of a great deal of interdependent

development and literature reviews on the “contributions of clusters to TNCs” and “contributions of TNCs to clusters”, Enright (2000) proposed the interaction into the third model of regional cluster development.

Using the case of the Hong Kong financial-services, the study reveals that, in addition to clusters that are either independent of or dependent on the subsidiaries of foreign TNCs, there are clusters in which the development of the cluster and the strategies of foreign TNCs are interdependent. The study outlines a model of regional cluster development in which the clusters and foreign TNCs are interdependent. Such clusters are characterized by a strong or dominant presence of foreign TNCs as well as a strong contribution by cluster-based subsidiaries to the overall strategy of the TNCs.

The interdependent model of cluster development is set forth in a series of propositions. First, interdependent clusters are characterized by a strong or dominant presence of foreign TNCs as well as a strong contribution by subsidiaries in the cluster to the overall strategy of the firms. Despite the dominance of foreign TNCs, no single or small set of TNCs determines the fate of the cluster. Second, interdependent clusters provide types of investment opportunities and benefits to foreign TNCs that go beyond those usually contemplated in the TNC literature, while the locations housing such clusters receive benefits that also go beyond those usually contemplated. Third, interdependent clusters do not fit the "satellite platform" characterization even if foreign TNCs are a dominant presence. As a result such clusters should not be as vulnerable to the departure of foreign firms as are clusters dependent on foreign TNCs. Fourth, the locations of interdependent clusters provide cluster-specific advantages attractive to foreign TNCs, but these advantages might not be sufficient to generate world class local firms on their own.

3. TNCs' FDI and the Formation of Automobile Industry Clusters in China

3.1 Four waves of TNCs' FDI in automobile industry in China

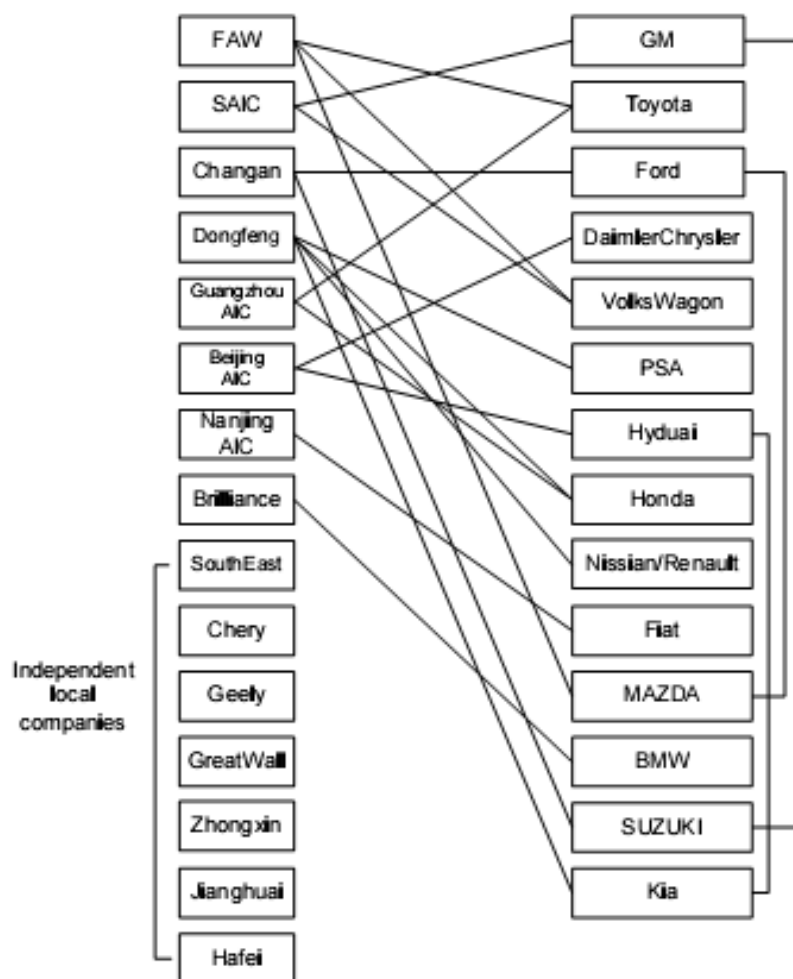
The first automobile manufacturing base in China, FAW (First Automobile Works), was built in July 1956. FAW produced CA10 truck in 1956. In the 1st five-year plan period, only the middle size trucks were produced in China and the government only positioned the automobile industry as a production-driving industry. In 1958, FAW's “red flag” car and Shanghai Auto's “phoenix” car were produced. From then on for about 20 years, there was no big progress in the Chinese Automobile industry on both production and

technology sides. Production capacity was low, and technology was outdated (Liu 2003; Luo, 2005).

After the Reform and Opening Policy in 1978, in the context of increasing domestic demand and industrial development strategy's changing, China tried to introduce technologies through various modes and transformed the products structure of the automobile industry. Especially, the Chinese government decided to transform the automobile industry from a truck-concentrated one into a car-concentrated one in 1987. From then on, the Chinese automobile industry stepped into a fast growing age. Then a lot of Sino-foreign joint ventures were established in China, where the technological matured products were introduced from those world famous car makers. The Chinese government ruled in its "Automobile Industry Policy" that the foreign automobile companies can only make engines and finished cars in China together with Chinese local manufacturers, and the foreign companies are not allowed to have the majority (over 50 percent) of share holdings in the joint ventures. Since then on, all of the world's major automobile makers, such as General Motors, Toyota, Ford, Volkswagen, DaimlerChrysler, Nissan-Renault, PSA Peugeot Citroen, Honda and BMW, have established joint ventures in China. In particular, the joint ventures control about 90 percent of China's passenger car market.

So far, the process of transnational corporations' FDI and joint ventures establishment in China's automobile industry could be classified into the following four waves. The first wave came in the mid 1980s, when the first car joint venture—Beijing Jeep Co., Ltd. was signed up in the May 5th, 1983 and began operating in Jan 15th, 1984. Following was Shanghai Volkswagen's contract, signed up in that October. In the July 1985, Guangzhou Peugeot was founded (Wang Zhe, 2000). The second wave began in the early 1990s, when they FAW Volkswagen and Shenlong Fukang were produced, although both of them encountered many difficulties. The third wave (in the late 1990s) absorbed the experience of the former two times, which was more careful and more successful. Guangzhou Honda, Shanghai GM, Tianjin Toyota were established at that time. In 2001, it was the fourth wave, which included BMW and Brilliance, Nissan and Dongfeng, KIA, Yueda and Dongfeng, Mitsubishi and South East Motor and so on. By the end of 2007, there are 123 automobile makers in China, including the "big three" (FAW, SAIC and Dongfeng) and their joint ventures with TNCs, and newly established independent producers, such as Chery, Geely, Lifan and etc.

Figure 1: The major players in the Chinese automobile industry



(Source) Luo (2005)

3.2 Formation of Automobile Industry Clusters in China

Government's positive industry policy and increasing TNCs' FDI accelerated the clustering in automobile industry in China. According to different criteria for the classification of Automobile industry cluster in China, there are different kinds of categories, such as three clusters category, five clusters category, six clusters category, etc. Among these categories, the three clusters category includes Bohai-rim cluster (consisting of auto enterprises and groups in the three Northeast China provinces and Beijing, Tianjin, Hebei, Shandong), the Yangtze River cluster (covering Chongqing, Hubei, Hunan, Jiangxi, Anhui, Jiangsu and Shanghai) and the South China or Pearl River Delta cluster (covering Guangdong, Guizhou, Fujian and Hainan with Guangzhou

City as the core), in which each cluster includes a broad geographical scope. The five clusters category refers to clusters in the regions of Yangtze River Delta, Pearl River Delta, Northeast China, Beijing-Tianjin and Central China. Based on industrial method (IPM), China's automobile industry cluster can be divided into three different levels of a total of nine industrial clusters, accordance with the provincial-level as a unit, namely, the first level "the 5 formed industry clusters (Jilin, Hubei, Shanghai, Chongqing and Beijing-Tianjin region), the 2 second-level "initially shaped industry clusters" (Jiangsu and Liaoning), the third level, "the 2 emerging industry cluster" (Guangdong and Anhui).

In these categories, the six clusters classification is more general, including the Yangtze River Delta Region, Pearl River Delta Region, Beijing-Tianjin Region (the Bohai Sea Rim), Northeast China Region, Central China Region and the Southwest China Region. In addition to these major automobile industry clusters, there are also some small scale clusters, such as those one in Shandong, Hebei and Fujian. The above six major clusters are described and compared briefly as follows.

1. Yangtze River Delta Region. The industry cluster covers Shanghai and partial of Jiangsu, Zhejiang, Anhui provinces, with Shanghai as the core. Major vehicle manufacturers are Shanghai Volkswagen, Shanghai GM, Shanghai Maple, Geely, Nanjing Iveco and so on. The advantages of this cluster is advanced economy, high quality in manufacturing industry. Shanghai is the core of this industry cluster with its leading position as one of the China's auto industry bases since 1949 and "SAIC" as one of the "big 3" automobile groups in China. Since 1985, the establishment of China's largest car joint venture- Shanghai Volkswagen, Shanghai automobile industry stepped into a shortcut of rapid development. Then, the joint venture Shanghai GM was established with huge investment. With this match, the China's largest parts and components industrial base with full range and huge scale was formed. Shanghai has more than 50 world-class automobile components joint ventures. In addition, Shanghai is building Shanghai International Auto City in a area of 63 square km, including the expansion project of Shanghai Volkswagen, a large number of auto parts suppliers, as well as automobile trade and marketing , automobile show Expo, F1 racing games, storage and logistics system, automobile testing organizations, automobile education in a multiple functional industrial area.

In Jiangsu Province, Nanjing Automobile (NAC Group), Chunlan Automobile, Yangzhou Yaxing Automobile, Yancheng Dongfeng Yueda Kia automobile have formed an intensive Automobile industry belt. In recent years, Chang'an Ford establish a second factory in Nanjing, attracting Ford and its allies-Mazda, forming two core businesses with Nanjing-Fiat in Jiangsu,.Coupled with the Shanghai Volkswagen plant founded in 2008 in Nanjing, there emerged a relatively dense clusters of the Automobile industry.

In Shanghai and Jiangsu Province, the automobile industry developed mainly based on state-owned enterprises and their joint ventures with foreign companies. However, in Zhejiang province private automobile enterprise are the main players. When Shanghai and Jiangsu vigorously in the development of the early stages of the Automobile industry, automobile parts enterprises in Jiangsu and Zhejiang region have emerged to form a complete matching system, and thus gave birth to automobile makers such as Geely, Gio and Chung-tai, and parts and components makers, such as Wanxiang Group, Huaxiang Group and a large number of small and medium-sized private automobile enterprises. Zhejiang has become China's major auto parts production base and export base.

Anhui Province has developed rapidly in Chery Automobile Group, and Jianghuai Automobile, as with the Nanjing Yangtze River along with the Department, the accumulation of a significant effect. Today, the Yangtze River Delta vehicle manufacturers and parts and components the size of the business rank first in the country and became China's largest automobile production base.

2. *Pearl River Delta Region.* This cluster includes Guangzhou and the surrounding cities where Guangzhou Toyota, Guangzhou Honda, Dongfeng Nissan and BYD are the main automobile manufactures. The advantages of this cluster are the appropriate involvement of the government and the complete industry chain. Although the bankruptcy of Guangzhou Peugeot in 1997 made Guangzhou thwarted the development of the automobile industry, the acquisition of Guangzhou Peugeot made by Honda in 1998 brought new opportunities. Guangzhou Automobile Industry Group (GAIC) requested Honda to introduce the synchronal global models and utilize the abandoned Peugeot production line. In this way, with only small additional investment, the automobile industry in Guangzhou survived. The success of Guangzhou Honda

attracted gradually more joint venture projects, such as Toyota, Nissan. These joint ventures in Guangzhou attracted their suppliers to follow. Utilizing the clustering policy, Guangzhou government integrated resources to set up several major automobile industry parks to ensure the low land prices, advanced transportation and lenient policy. The three Japanese automobile makers' entry in Guangzhou led the Tokyo Seat Technology, the Japanese Stanley Electric, Denso Japan, the Japanese Aisin Seiki, Wanbao Wells Stamping Unix, Hitachi U-hi Ya and many other automotive components suppliers to enter jointly. Now in Guangzhou and surrounding cities, there has emerged a complete industry chain covering parts and components research and development, vehicle production, logistics and transport, personnel training. At present, with entry of the three Japanese automobile manufacturers Toyota, Honda, Nissan and the following of Hyundai commercial vehicles, Isuzu passenger cars and the growing of indigenous BYD and Foudy, the so-called "Oriental Detroit emerged as a new industry cluster in the Pearl River Delta region.

3. *Northeast China Region.* This region is one of the old industrial bases in China, where the automobile industry and components industries are perfect. There are a large number of vehicle manufacturers such as the FAW Group, FAW-Volkswagen, FAW Mazda, Hafei Automobile(LKD) and Brilliance China Automotive, BMW Brilliance, Jinbei GM. In Jilin province, there are a large number of auto makers, such as FAWER, koyo FAW, FAW East Mechanic, Changchun Hella, Changchun Fawer - Johnson, FAW – Kyle-Hayes, Tower Changchun, Jilin Northern Czech-Kai . In Shenyang, there are Mitsubishi Engine and dozens of auto parts makers. In addition, in the Northeast China region, the level of automobile related education is higher, many universities have dedicated professionals such as automotive engineering. The advantages of this industry cluster are solid industrial base and governments support. In 1953, the earliest and largest automotive production base in China, FAW started in Changchun, symbolizing China's auto industry's start. In the late 1980's and early 1990's, when those world famous automakers intended to enter China, FAW Group has become one of the key partners to cooperate with. Later, under the support of government, the FAW strengthened independent research and development and the cooperation with upstream industries. Profound mechanic industry basis and complete industry structure promoted the automobile industry diffuse rapidly from Changchun to other cities in

Northeast region and there emerged new auto makers, such as Brilliance Group in Liaoning and Hafei Group in Heilongjiang, which consolidates Northeast China position as one of the most important automobile production bases in China.

4. *Beijing-Tianjin Region.* The geographic distance between Beijing and Tianjin is only 130 kilometers, the position of automobile industry in these two metropolises are important in China. There are Beijing Hyundai, Beijing Jeep, LHB and the newly-established Beijing Benz in Beijing, and FAW Toyota, FAW Xiali, Tianjin FAW cars in Tianjin. There are many automobile parts and components makers, such as Tianjin Denso, Tianjin Stanley, HSBC Tianjin, Tianjin Axle, Tianjin Stars, Beijing Monoprill and etc. The advantages of this industry cluster are the location as the political and economic center, the developed economy, increasing demand, convenient infrastructure for both of production and distribution. In May 1983, Beijing Automobile and Chrysler set up the joint venture, Beijing Jeep, which is not only the first joint venture in automobile industry in China, but also the largest joint ventures till that time. With the government's strong support and the base of manufacturing industries, the automobile industry stepped into a period of rapid growth since 1980s in Beijing and the automobile industry has also become a pillar industry of Tianjin. With the strategic alliance between Tianjin Automotive Group and FAW Group, and Beijing Automobile Holding Company's development through Beijing Foton, Beijing Hyundai, Beijing Benz-Dyke and Beijing Automobile Works, there has emerged an obvious automobile industry cluster in this region.

5. *Central China Region.* This cluster mainly refers to Hubei Province, which is an important transport hub in China. The representative of vehicle enterprises in this cluster are Dongfeng Motor, Dongfeng Peugeot-Citroen, Dongfeng Honda and so on. Its advantage is the central government's support and convenient location for transport. After P.R. China was founded, Hubei Province which proximity to the Yangtze River began the comprehensive development of transport undertakings, to further consolidate the Yangtze River industrial city status. In 1969, the Second Automotive Group was set up in Shiyan of Hubei. In 1990s, it was changed into "Dongfeng Automobile" and become one of the China's "Big Three" auto groups. Shiyan is a typical automobile city where 90% of the industries are related to automobile and also has China's largest auto

parts market - the “China Auto City”. With support of central government’s automobile policy, the Dongfeng Automobile developed rapidly. In recent years, with the Dongfeng Group’s the strategic transformation and central governments’ industrial planning, Dongfeng Motor moved partial of the commercial vehicles production base to Xiangfan, moved passenger car production base and headquarters to Wuhan, therefore a so-called Shiyang-Xiangfan-Wuhan automobile industry corridor emerged. Coupled with well-developed waterway and land transportation, Hubei Province not only strengthened its existing competitiveness in truck industry, but also attracted Peugeot-Citroen, Honda and other auto makers. With Dongfeng Automobile’s growth and several world famous auto makers’ entry, there had established the Wuhan-Xiangfan-Shiyang automobile industry belt in Hubei province.

6. *Southwest China Region.* This cluster mainly concentrated in the Chongqing Municipality, which is well known for its advantages in mechanical manufacturing industries. There are some joint ventures such as Changan Automotive Group, Changan Ford Mazda, Changan Suzuki and dozens of vehicles enterprises like Lifan automobile. As early as before 1949, Chongqing is a well-known industrial city. With the Territory of Chongqing, as well as the prosperity of the transport industry, Chongqing has become an important ground where a large number of automobile manufacturers to compete. Although large automobile manufacturers in Chongqing are Sino-foreign joint ventures, Chongqing government always insists on self-development and encourages local firms to learn effectively and form their own intellectual property products. As China’s largest small size automobile and engine manufacturer, Changan Group has become one leader for independent innovation in China’s automobile industry. Good basis in motorcycle industry cluster and the motorcycle makers’ strong entry motivation to the automobile industry have provided positive conditions for the formation of industry clusters in the region.

4. Case of Volkswagen and Automobile Industry Cluster in Shanghai

4.1 Volkswagen and GM’ FDI and automobile industry clusters’ formation

The type of Shanghai automobile industry cluster is a kind of cluster immigration; that is, through the introduction of leading vehicle companies (Shanghai Volkswagen, Shanghai GM, etc.) and their influence in the automobile industry, encourage the

original and new components suppliers to invest in Shanghai. Then the whole industry cluster is established. In the formation and development process of Shanghai automobile industry cluster, the early entrant “Shanghai Volkswagen” and the follower “Shanghai GM” played a positive role in driving and enhancing. There was a progressive interaction relationship between the industry cluster and the multinational companies.

In the formation and development process of Shanghai automobile industry cluster, the two multinational companies, Volkswagen and GM, which built production bases by direct investments, played a very important role. The entrance of the two companies, followed by foreign component manufactures, which introduced advanced technology and production methods, accelerated the formation of Shanghai automobile industry network.

After German Volkswagen firstly built their joint venture, Shanghai Volkswagen, they began to reproduce their production interlink network in Shanghai. In the beginning, German Volkswagen established a coordination team for domestic production, which helped domestic component producers import technology and equipment, invite German retired experts to training themselves, and build joint ventures with the original German component manufactures. Through the German Volkswagen’s introduction, many German component companies built joint ventures in China, and there were multi-contacts between Shanghai Volkswagen and German Volkswagen’s original technology and production firms. Only in China, Shanghai Volkswagen has production and technology contacts with more than 180 joint ventures; some of them are famous foreign companies, such as Autoliv, Henkel, GKN, Bosch, BASF and so on (Mu Rongping, 1997). In the early 1990s, the amount of home-made Santana reached more than 90%, which promoted passenger automobile industry’s development greatly. These efforts helped Shanghai set up a complete, modern vehicle and component industry network primarily.

The automobile production network promoted by Volkswagen was exactly one of the main reasons why GM decided to set up a production base in Shanghai. GM also introduced lots of component manufactures, and this enhanced the supporting capacity of Shanghai automobile industry further. This shows that foreign vehicle and component producers played a leading role in the formation of Shanghai automobile industry cluster and network; they promoted the industry structure and improved the production

network.

In addition, the technological spillover effect of foreign enterprises had also promoted the technology of Shanghai automobile industry and in particular, the components industry, and improved further development of Shanghai automobile industry cluster. According to the dictation Wong Jianxin, who had taken part in the Shanghai Volkswagen joint venture program negotiation, China required a completed development technology transfer. At the same time, China also required Shanghai Volkswagen would be able to develop its own cars in the future. The German side agreed in principle with several conditions: Firstly, the country's demand must be huge because the development cost must be distributed to every car. Small amount would cause negative profit. Secondly, the production scale must be large. Thirdly, the development fund must be ensured despite the other capital might be borrowed from banks. The two sides also agree to use parts of Shanghai Volkswagen's revenue as the development funds, which was rarely seen in other joint ventures. The Shanghai Volkswagen joint venture program contract was very detailed (in the general contract now, there are usually only joint capital contract and joint technology import contract), beside technology import contract and joint capital contract, there were lots of accessories, including home-made plans, training programs and so on. Both were prudent and serious so the negotiation last for a long time.

First of all, the strict screening of vehicle manufacturer, forced the component producers improve their technology and management. Before choosing component suppliers, Shanghai Volkswagen will assess their production design capability and technology level comprehensively. If satisfied, they would provide the technology standards to the component producers, and prescribe the supply condition by signing a detailed supply contract. After component supplier produced the product according to the standard, Shanghai Volkswagen would identify the product. If it meets the criteria (otherwise, there would be a number of improvements, until it meets the criteria), Shanghai Volkswagen would evaluate the supplier further. This included the production process, equipment, management, and cost and so on. If component producers pass this assessment, they could sign a small test supply contract with Shanghai Volkswagen. The first test supply component must be tested by Shanghai Volkswagen, and there was an assessment of the trial operation (that is, assemble the components and observe the operation situation). And if they pass the trial operation, the component producer could

be identified as the official supplier finally. The whole process would last for 1-2 years. For the suppliers, this was indeed a process of improving their technology and management level. Secondly, by cooperation with foreign companies, component suppliers can improve their technology and management level by technology importing, digesting and absorbing, imitating and improving. Under the vehicle company's pressure and by the self-study effort of component producers, the production network's general technology and management level improved greatly (Li, 2002).

4.2 The FDI regulation, home-made policy and clustering in automobile industry

Home-made policy is that the host country regulates the foreign investment firms' products must contain some domestic parts. They must purchase some raw material and components from the host country. Tariffs, quotas, and subsidies are common policies to encourage domestic production.

Automobile industry is the first and only one whose development policy was made by the country solely, and the policy has a very important promoting effect on Shanghai automobile industry's development. China's government tried to build a circuitous path for 'Chinese car' by fostering domestic components producers. In particular, the tariff rates are based on the home-made ratio of the imported technology products. When 100% components are imported, the tariff rate is 50%; while the home-made rate reaches 80%, the tariff rate drops to 20%. In addition, when foreign companies want to build factories in China, they are restricted strictly by the auto industry policies, which prescribe that the assembly plant must be built in the form of joint venture, and the shareholders' proportion must be 50%:50%. These policies forced the foreign auto industry establish production bases in China.

In the late 1980s, China had set series of automobile home-made policies by tax incentives, partly home-made requirements, import restrictions and limits on foreign investment. In 1994, the State Council promulgated "Automobile Industry Policy"; On April 1st, 1999, they promulgated (90) Tax 495 "海关总署、国家计划委员会、国家税务总局关于运用税收优惠促进小轿车国产化的暂行规定"; On January 1, 1997, Tariff Policy Commission of the State Council promulgated "关于运用关税手段促进轻型客车国产化的暂行规定". In the area of incentive policies for home-made cars, China regulated that in the initial home-made stage (5 years), there were different tariff rates according to the home-made level. In the light duty buses, China also had the

preferential taxation policies.

In order to comply with WTO's "Trade-Related Investment Measures Agreement" ("TRIMs"), China promised to amend some foreign investment regulations. The local content requirements, trade balance requirements and foreign currency restriction for import were abolished. The regulation on foreign investment was relaxed. Complying with TRIMs becomes an important turning point of China's auto industry's development. In the middle 2004, after implementation for more than 10 years, the 40% home-made ratio and the preferential taxation rate for different scales of home-made ratios were abolished. From January 1, 2005, China abolished the quota and licensing of motor vehicles, and the auto tariff fell to 30%, components tariff fell to an average of 10%.

With the abolishment of 1994 "Automobile Industry Policy", more and more vehicle producers import components and assemble domestically. This had a considerable impact on the development of China's local component industry. In June 2004, the National Development and Reform Commission promulgated the new "Automobile Industry Development Policy", which abolishes foreign currency balance, home-made ratio and export performance requirements, raises the brand strategy, encourages products with independent intellectual property rights, clears the policy direction for China's automobile industry's independent development, guides mergers and restructuring of current enterprises, and promotes the domestic firms grow bigger and stronger. The "构成整车特征的汽车零部件进口管理办法" which took effect from April 1, 2005, provides an identify method of the whole vehicle. This not only restricts the phenomenon of importing components and assembling, but also prevents the loss of national tax revenue.

The formation and development of Shanghai automobile industry cluster is not solely controlled by foreign companies' global distribution intentions, but a two-way process. Although since 1980s, China introduced the reform and open policy, and the domestic environment transformed to market economy from planned economy rapidly, the government plays a leading role in economy development, in particular the Shanghai government, which is still a strong intervener. The central government and Shanghai municipal government's supports promote the development of Shanghai automobile industry's development, stimulate the regional development of production network, enhance the competitive atmosphere in the region, and promote domestic component suppliers enter the world's automobile production network.

4.3 Interaction between Shanghai Volkswagen's components localization strategy and Shanghai government's industrial home-made (or localization) policy

When Shanghai Volkswagen went into production, the technology of China's whole vehicle and vehicle parts industry were far behind the international level. At that time, the China-made parts and components of the proportion was only 2.7 percent, which only came from the four tires, radio cassette player, loudspeakers, antenna and small signs, "the five cases" (Xiongqiong Jing Long, 2006). By CKD method (foreign vehicle parts assembled domestically) Shanghai Volkswagen introduced the first generation of products, Santana. In order to ensure that world's advanced level of product quality, Shanghai Volkswagen has introduced a number of foreign software technology, and imported a significant number of key processing equipment and test equipment. CKD method made Shanghai Volkswagen produce a relatively high level of product in a short period of time and effectively shortened the Chinese car industry with foreign advanced level. So that at the same time it avoided paying high import duties of whole vehicles. But the shortcomings in the CKD method were also gradually exposed. Just CKD simply assembled parts from abroad, which for Shanghai Volkswagen, it was only favorable way to enter Chinese market and obtain huge profits. As the Volkswagen adhered to the joint venture agreement that the foreign currency Shanghai Volkswagen needed to buy spare parts required the guarantee of China's highest security body, only after the second year (1986) the German side had attained 160,000,000 marks from the 10,000 sets of Santana imported from the Shanghai Volkswagen, equivalent 4 times of their investment in Shanghai Volkswagen. And with the excuse of value-added mark, Germany increased the cost of imported parts from 18,000 yuan before the establishment of joint venture to 32,500 yuan each by the end of 1986 (Wang, 1992). At the same time, due to the use of original brand and Industrial Property of foreign auto companies, technology demanded strict duplication, resulting its heavy rely on foreign technology brand and industry property rights. As a result, to speed up the process of localization had become a top priority of Shanghai Volkswagen and the whole Chinese auto industry.

4.3.1 Volkswagen's localization strategy: "7-year plan of parts and components localization" in the Joint venture contract

According to WENG Jianxin's dictation who had taken part in negotiations on the

Shanghai Volkswagen's joint venture project, localization of Chinese parts had been carefully studied by China and Germany parts and was also the most important part in joint venture project. The German side insisted on localization after the introduction, and was willing to help raise the localization rate of parts and components in China. In the negotiations, Germany experts went to Chinese parts factory to find out the operation, at the same time, Chinese experts have repeatedly visited the parts and components factory in Germany. After the visit, experts from both sides sat together to discuss, based on the different difficulty of parts and components, they finally reached a seven-year plan of China-made parts and components. This details 7-year schedule of China-made parts and components listed the localized parts in each year and the localization rate, and planned to reach a over 90% localization rate by the seventh year, when local production to. When Shanghai Volkswagen's joint-venture projects had been formally negotiated, it would be an annex to the contract. The main two ways for China-made parts and components to be localization were the introduction of technology and the formation of joint venture with German parts plant. Since the simple parts and components would soon be able to achieve localization, while the complex would take more time, the German side asserted that once the parts had reached the requirement of localization, it would no longer be imported, and used domestic components instead. In this way, each part meeting the requirement of localization can be quickly put into operation. As a result, the parts plant had high enthusiasm.

4.3.2 Shanghai Municipal Government's industry localization policy

Because of inadequate technology, the first home-made progress was rather slow. In 1988, local production was only of 13.09 percent. At that time, the establishment of "the Shanghai-based Chinese-made Santana sedan Community," effectively integrated all the forces, promoting the localization process comprehensively. In the face of problem that the complementary parts cannot keep up, Shanghai Volkswagen regulated that for each Santana to be sold, a 28,000 yuan would be collected for "Domestic Fund" to nature the car's Supporting business with the city government's support and decision.

In addition to the above-mentioned nation's specific policies on the Automobile industry, the Shanghai municipal government was very supportive of the plan of Shanghai Volkswagen, formulating a series of policies to promote the localization of the Shanghai Automobile industry. On August 4, 1986, the first localization Conference of

Santana was held in Shanghai. On July 19, 1987, the Shanghai Municipal Government set up the "leading group to support the building of Shanghai Volkswagen", with the vice mayor of Shanghai at that time, Huang Ju, heading the office, and set up the localization Office of the Santana sedan to be in charge of organizing and coordinating the detailed work of localization. Subsequently, the Shanghai municipal government also approved in 1988 to collect localization tax for Shanghai Volkswagen's Santana sedan, set for the Santana sedan made of a special fund, that is, each selling a Santana sedan, which was used for a "specific domestic funds". That is, for every purchased car an amount of 28,000 yuan was collected (that is, every purchased buyer was required to pay 28,000 yuan) by the Shanghai municipal government to pay to nurture the car supporting companies. The total of localization Fund was 6,000,000,000 yuan. This was a special policy in a time of car shortage. Domestic funds sped up the localization process of Chinese-made auto parts plants and also helped to save their investment costs of Shanghai Volkswagen.

In order to speed up Santana's localization process, in the working conference for Santana sedan's localization in December 1987, the National Economic Council's Deputy Director at that time Zhu Rongji initiated to set up a "Shanghai-based Chinese-made Santana sedan Community" as the contact to link with the whole vehicle factory and the Supporting works. The initiative had got a wide spectrum of responses. With the approval of the Shanghai Municipal Government, on 1st and 2nd July 1988 in Shanghai, the establishment of the "Shanghai-based Chinese-made Santana sedan Community" was hold. The delegates were from every Shanghai Municipal Bureau of industrial systems, automotive and tractor joint venture, aviation industrial companies across the country in steam systems, aerospace systems. The total was 105 fixed-point support units and 16 research institutes in colleges and 130 delegates from Bank. Zhu made the important speech "localization was the lifeblood of Shanghai Santana sedan"; then-Deputy Mayor of Shanghai, Huang Ju made the statement guidance "Be united and build the community,". The General Assembly adopted the "Community charter of Shanghai-based China-made Santana sedan", and elected the first Community Council. Wang Rongjun, general manager of Shanghai Volkswagen was elected as the chairman, the technology implementation manager of Shanghai Volkswagen Paul (Hans Joachim Paul) and Chen Ting, deputy general manager of the Shanghai Tractor joint venture company as vice chairman of Vietnam. At that point, "the Shanghai-based

Chinese-made Santana sedan Community," was officially proclaimed being established, including more than 140 car parts matching plants, research institutes, universities and financial institutions, and it had gradually developed into a complementary parts system of for Shanghai Volkswagen (Mu Rongping, 1997).

The establishment of the community played an important role in improving the localization of the four series models of Shanghai Volkswagen. In October 2000, the Community changed its name to "Shanghai Santana Community." By 2004, the local production of Santana (B2) had reached 94%, 87.03 percent in 2000. And the local products in Passat (B5) reached 72%. By 2004, the Community was made up of 176 members, they were Shanghai Volkswagen Automobile Co., Ltd. and its key parts supplier, car sales companies and related maintenance stations, universities and research institutions. It became the life community for Shanghai Volkswagen car production, supply Business, marketing, maintenance services, scientific research and development. The Enriched connotation enlarged the Community's functions, making it more responsive to China's accession to the WTO after the development of the automobile industry. To December 2008, the "Shanghai Santana Community," had a membership of 205. Santana's local production had reached 98.9 percent. Shanghai Volkswagen had also gradually set up the supply network in China and the network of parts and components spared across 20 provinces and cities, with as many as 400 members. 85 percent of Shanghai Volkswagen's parts were from suppliers. Through many years' efforts, Shanghai Volkswagen had directly led to more than 200 auto parts joint venture to be established in China, promoted the localization process of the Chinese-made parts, and established the basement of China's auto parts industry.

In order to improve the domestic level, through the "Santana localization Community", Shanghai Volkswagen worked together with parts and components business to analyze techniques and explored the process. Then it established a fairly complete system of quality control, which can provide all-round support to capital, technology and human resources. Finally it found out success in localization.

The more than 400 parts and components enterprises which support for Shanghai Volkswagen's are widely selected as the supplier by other car manufacturers and some have also been included in the ranks of international procurement. With the promotion of Shanghai Volkswagen , a large number of Chinese car parts plants which grow up from nothing, from small to large and from weak to strong, have become China's small

auto parts industry giant. In the rapid development of China's auto industry, the base of Shanghai- auto parts industry is at the leading level. From 2003 (?), China put forward the strategic development of its own brands. Because of the higher base of the parts of the industry, Shanghai Volkswagen's self-brand had high localization rate, which was almost 70-80%. The localization process of Shanghai Volkswagen had made tremendous contributions to enhance the level of Chinese matching parts system.

After China's accession to the WTO, localization rate provisions in the Automobile industry policy remained. Foreign car makers must ensure that the localization rate should be higher than 40%, or they would be subject to high tariffs. If reached the localization rate of 60% within 12 months (24 months up to 80%) after putting into production, the government would provide preferential treatment in customs duties. For vehicle manufacturers, there was a very important term that a few types of strategic would be allowed to be imported. They were engines, transmission, axle and the body, and so on. Because of the high tariffs imported on parts and components, cost of production was very high. So from a policy perspective, this led to the localization of Shanghai Volkswagen.

4.3.3 The spread of Shanghai Volkswagen's components localization

The spread of Shanghai Volkswagen's Santana localization process is divided with vertical and horizontal aspects. vertical localization mainly refers to the whole car and engine. After transformation in the first phase of construction, Shanghai Volkswagen has been capable of 60,000 vehicles and 100,000 engines, in addition to the press in 1991, with international standards technology of the 1980s. 2600 advance equipments compose 29 assembly lines, in particular, engine manufacturers adopt international advanced technology and up to the Domestic highest level at that time. After the second phase project of transformation, it produced a vehicle production capacity of 160,000 in 1994; in 1995, Shanghai Volkswagen, Volkswagen and Brazil successfully develop a joint public Santana 2000 car which downlined the assembly line and Input market; in 1997, after a small amount of investment in Engine Plant construction, it came to a production capacity of 300,000 vehicles and 330,000 engines.

Horizontal localization is mainly the foundation of components matching system except the body and engine parts. During the whole " seven Five-Year Plan" period, the vehicle parts and components of Santana reached 1:1 ratio, and during

the "Eighth Five-Year Plan" period was as high as 1:2. At the same time, with the first project of Shanghai Volkswagen, the investment of Shanghai's horizontal matching parts was about 1,000,000,000 yuan. During "Eighth Five-Year Plan" period, the vertical investment of Shanghai's car industry was about 2.6 billion, but the horizontal investment (including the national matching projects) reached to 4.7 billion. The matching industry of the auto component parts has rapidly risen with a breakthrough of Shanghai Santana.

From August 1, 1991, the Shanghai Santana has led the introduction of all models in China, and the first import permission from the country ended the China's history of importing the car parts assembly. In 1995, Shanghai Volkswagen was the China's first manufacturer which passed the international ISO9001 certification. By the end of 1996, the local ratio of Santana increased from 2.7% to 90%, so that it could firstly bid farewell to the first CKD way among all the introducing models in China. Up to October, 2004, the local ratio of the car parts of Santana and the Santana 3000 has reached 98.9% and 89%, the local ratio of Santana (B2) has reached 94%, 87.03% for the Santana 2000, Passat (B5) for 72%, POLO series car for 77%, GOL car for the 51%. The average of local ratio has reached more than 80%, and the domestic purchase of the parts and components amounts to more than 300 million in one year.

4.3.4 The local protectionism of Shanghai Municipal Government for automobile market

The administrative decentralization and the fiscal responsibility system since reform and opening up resulted in China's serious local protectionism, and the closed area makes Shanghai Automobile industry from the initial stage with the economic characteristics called feudal economy. Out of the "local protectionism" and Shanghai government hope to bring Auto Parts a sustained development, SAIC as a state-owned enterprise in Shanghai holds a decisive position and power on the formation of Shanghai's Automobile industry Cluster. With various forms of closely contact with local authorities, banks and the Government, the SAIC exerts great influence on the development of the Automobile industry cluster in Shanghai.

Shanghai Volkswagen and Shanghai GM choose the suppliers will comply with the aforementioned three informal rules, the three informal rules propelled more Shanghai enterprises and the local car parts production enterprises to establish close links. In

addition, in order to protect the auto industry in Shanghai, Shanghai government provides that local taxi company in Shanghai to give priority to buying Shanghai-made cars. Shanghai Municipal Government also introduced a car plate auction policy in 1998, and the provision was enacted in order to limit the private purchase of non-Shanghai-made cars. According to regulations, the purchase of private license Santana with starting price of 20,000 yuan and the purchase of non-Shanghai-made cars the vehicle license plate the starting price is 100,000 yuan, But because of the pressure from public the car plate auction had been changed to " No basic price to bid a car plate of passenger cars made in china used for daily life . " In a sense, the Shanghai local government protectionism led to the car and its related industries in the region gathered in Shanghai which promote the Shanghai Automobile industry Cluster.

5. Discussion and Analysis

5.1 Characteristics of the automobile industry (Lean Production) and requirement for clustering

Automobile industry cluster refers to a regional economic system in a certain geographical area with the automobile industry as the core, parts and components industry as the upstream and professional services industry as the downstream industry. With a high degree of aggregation from a large number of collaborative relationships with vertical or horizontal specialization of the complementary relationship, the regional industry cluster established strong cost advantages and innovation advantages.

The automobile industrial chain is long and intensive involved in the upper reaches of metallurgy, iron and steel, machinery, electronics, rubber, petrochemicals, plastics, glass, chemicals, textiles and other industrial areas, and extend to the commercial, repair services, the insurance industry , transport and road construction and many other industries. Automobile industry is highly dependent on related industries and played a strong leading role as well, and through the implementation of industry cluster strategy, it can effectively promote the automobile industry and bring a rapid development of related industries. In the industrial clusters, the highly specialized division of labor, bringing the formation of large-scale production and sales, greatly reducing the production and transaction costs, which finally form the whole industry chain and create a strong leading industry's competitiveness.

The lean production used by Shanghai automobile enterprises is important internal impetus for the formation and development of the Shanghai auto industry. To a large extent, Shanghai Volkswagen and Shanghai GM have implemented the lean manufacturing. For example, since the JIT production adopted by Costa Huayang Electrical Appliance Co., Ltd. at the end of 2003, inventory of spare parts have been greatly reduced. Customers must produce and shipment in accordance to the orders. The total stock has dropped 10%, greatly reducing the backlog of inventory and the resulting danger of depletion only in this aspect. Yanfeng Visteon Automotive Trim Systems Co., Ltd has implemented QAD ERP system for 7 years. The QAD ERP system is based on the QAD system aiming at exterior development and providing an integrated solution. It covers production, materials supply, distribution, quality management, and other business areas, which has successfully brought modern production technology of precision into the traditional ERP system. So far, the system has been successfully applied to 4 dashboard module assembly for the supply business in Shanghai GM and Shanghai Volkswagen and etc. The management system of the flow of spare parts has been implemented in 4 factories in Shanghai, including the Yanfeng Visteon and more than 150 suppliers have used this e-commerce system. Lean production system, particularly the JIT system has been widely used in Shanghai Automobile industry, which requires parts suppliers to shorten the geographical distance with the plants, making it possible for long-range suppliers (such as those from Guizhou, Hunan and Beijing) to set up factories in Shanghai suburbs to maintain continuous supply. This has led to integrated distribution of the parts suppliers in Shanghai and neighboring districts. For example, in 1988, parts suppliers in Shanghai accounted for 54.2% of Shanghai Volkswagen's suppliers. In 1997, the figure has rose to 64.1 %.(Xiaojian Li, 2002).

6. Conclusions and Implications

Interaction between TNCs and industry clusters has been an interesting and critical issue for both of the policy makers and academicians. This study tries to investigate and find the mechanism of the interaction between TNCs manager and host country governments' policy makers. In the Chinese context, there are some cases that TNCs and regional industry cluster contribute to and benefit from each other. This paper selects the automobile industry as the case, especially focusing on the case of automobile industry cluster in Shanghai.

In this case, we can find the interactions among governments (central and municipal), TNC(early mover Volkswagen and follower GM), local partner(stated-owned enterprise SAIC). In order to promote local SOEs to learn technology and upgrade the industry, under the FDI attracting policy, central government encouraged the SAIC to cooperate with Volkswagen through joint venture's establishment, then Volkswagen invested in Shanghai as the anchor firm, followed by German parts and components makers also through joint ventures' establishment between them and local partners. These assembler and suppliers' entry and agglomeration promoted the formation of the industry cluster. Assembler Volkswagen's capacity increasing pulled the components suppliers' reinvestment in Shanghai. Increasing supply of the qualified components attracted the follower GM to invest in Shanghai. GM's coming spurred American components suppliers to invest in Shanghai. Therefore, there are two round investment by foreign TNCs, Volkswagen and GM, followed by their components suppliers. Within these process, central government published the guide policy on the localization of the components production, and municipal government implemented specific policy to encourage the localization. At the same time, TNCs Volkswagen promoted German components makers' cooperation with local partners in Shanghai and other area in China. In this process, industry cluster expanded gradually.

In the interaction process between TNCs and industry cluster, Volkswagen contributed the industry upgrading, especially in the automobile components industry. Although there is not obvious technological capability's improvement for the local partner SAIC, such as self-brand products' development and technological innovation, there is a remarkable growth for SAIC, such as firm size, management and reputation. Beneficiary from the upgrading of automobile components, newly established independent automobile makers Cherry and Geely, Maple could share the qualified components supply. As one of the early movers in automobile industry in China, Volkswagen benefited not only from the beneficiary policy on tax, land, marketing for FDI early movers, but also from low transaction cost on the local procurement for qualified components in Shanghai and surrounding areas in China. Therefore, Volkswagen cultivated competitive advantages in the industry cluster.

After Volkswagen's entry in Shanghai, automobile industry has been one of the pillar industries. Shanghai has ever been the largest cars production base in China until

2007. Shanghai and Yangtze River Region became one of the leading production bases in automobile components industry. Especially Shanghai became one of the leaders in technology and marketing in automobile industry. As there is a long industry chain related to automobile industry, the economic effects of the industry growth are obvious in Shanghai and China.

This paper studies the interaction between TNCs and industry cluster through the case of Volkswagen and GM in Shanghai. As described above, the industry cluster expanded gradually from Shanghai to Yangtze River Delta region, and is still expanding to wide scope. Therefore, the mechanism of industry cluster expansion is an interesting issue for both of the core area and surrounding area. Additionally, emerging industry such as Pearl River Delta are attracting attentions, although there are already some studies on it, the industry cluster policy's learning process is also interesting. Shanghai has ever been the one of the leader in automobile industry in China, however, Guangzhou emerged quickly. According to the latest reports, in 2008 the output value of automobile industry in Guangdong became the No.1 in China.

This paper focuses on interaction mechanism between TNCs and industry cluster and pays less attention on interaction between or among firms. In fact, within and out of the industry cluster, there is a complex interaction among TNCs, local partners (state-owned enterprises) and newly emerged private players, especially the knowledge diffusion among them and local players' catch-up are valuable issues to study.

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