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Industrial Agglomeration, Production Networks and FDI Promotion

The Case Study of China

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SUMMARY

China's Industrial clustering is a distinguished economic phenomenon over the last 20 years. It began to enter into their fast track in the mid-1990s and developed rapidly in recent years. Both market-driven force and government-driven force contribute to Chinese industrial clusters.

The opening and stable macroeconomic policies create a favorable climate for the industrial clustering. In particular, the preferential policies towards FDI accelerate the inflow of FDI and concentrating in coastal regions. The contribution from local government lies in environment construction on "hardware" and "software" for industrial clusters.

The major contribution of FDI to the local industrial clustering lies in helping integrating Chinese domestic industries into international division and at the same time forging a relatively integrated production chain for Chinese domestic industries.

At present, China has entered into the new phase of industrial clusters upgrading. Chinese government is gradually improving the local "software" infrastructure for industry clustering. In the future, some considerations on Chinese industrial clustering need to be given. Firstly, it is necessary to develop national strategies and policies for industrial clustering in detail. Local governments can integrate all aspects of resources to clear the market channels for enterprise, expand clustering visibility in the international and national fields.

Secondly it is necessary to strengthen social networks and intermediate organizations. Thirdly it is necessary to promote industrial parks to become the birth place of industrial clustering.

Fourthly, it is necessary to Support the development of the industry matching to the leading industry to attract all kinds of investment.

Fifthly, it is necessary to take stringent measures to reduce costs of the development of the cluster from the "social cost" point.

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Industrial Agglomeration, Production Networks and FDI Promotion: The Case Study of China

Abstract

China's Industrial clustering is a distinguished economic phenomenon over the last 20 years. It began to enter into its fast track in the mid-1990s and developed rapidly in recent years. Both market-driven force and government-driven force contribute to Chinese industrial clusters. The opening and stable macroeconomic policies create a favorable climate for the industrial clustering. Local government has made its contribution to construction on both "hardware" and "software" environments for industrial clusters. The major contribution of FDI to the local industrial clustering lies in helping integrating Chinese domestic industries into international division of labor and at the same time forging a relatively integrated production chain for Chinese domestic industries. At present, China has stepped into the new phase of industrial clusters upgrading. Chinese government is gradually improving the local "software" infrastructure for industry clustering.

INTRODUCTION

China's Industrial clustering has been a distinguished economic phenomenon over the last 20 years. It began to enter into their fast track since the mid-1990s and developed rapidly in recent years. Take an example, till now value added caused by industrial clusters in China's eastern coastal provinces or cities has accounted for more than 50 per cent of regional GDP. In China, industrial clustering has been classified into three kinds in term of their patterns, that is, clustering in traditional industries such as small and medium-scaled enterprises (SMEs) clustering in textile and garment industries in Province of ZheJiang, clustering in capital- and technological-intensive industries developed by Chinese firms such as automobile in Province of Jilin, and clustering in industries induced by foreign investment firms such as automobile in Shanghai and electronics and electric industries in Province of Jiangsu. Both market-driven force and government-driven force contribute to Chinese industrial clusters. As indicated in some studies, foreign-invested firms are playing a more and more important role in forging Chinese coastal industrial clustering. In recent years, investment in electronic industry by multinational corporations (**MNCs**) in Jiangsu has been significantly increased as a contribution to link China's electronic and information industry to the global value chain and concentration of electronics industrial clustering in Jiangsu.

In this paper, our purpose is to show the role of market force and government in Chinese industrial clustering and provide some implications for future policies. The evidence sources from both the second-hand data and direct interviews. In December 2007, we made interviews with managers of 20 firms located in Beijing (software industries), Shanghai (automobiles), Province of Jiangsu (electronics and information industries) and Zhejiang (textile and apparel industries). As known in the interview, industrial clusters have become the main means of local economic growth mentioned above. The structure of this paper is as follow: Section 2 overviews policies such as industrial policies, trade and FDI policies and role of local governments since 1978. Section 3 is case study of industrial clusters. Section 4 presents conclusions and some implications for the industrial cluster policy.

1. OVERVIEW OF POLICIES

1.1. Industrial Policies

Industrial policies have experienced great adjustment since 1978. Before 1978, Chinese industrial policies emphasized the heavy-industry development strategy based on self-sufficiency and established heavy-industrial bases in some big cities. At that time, internal industrial linkage had been split into the linkage based on the administrative management. After that, Chinese industrial policies entered into a new phase. The sixth five-year plan (1980-1985), as the initial period of reforming and opening to the outside, put light industry as a priority for development and adjusted heavy industry to serve for developing consumer industry. Some light-industries have been developed rapidly in the coastal region, especially in Shanghai, Province of Zhejiang and Jiangsu. Then the real industrial clustering has begun to appear and developed rapidly during the seventh five-year plan (1985-1990) and the eighth five-year plan (1990-1995). However, at that time, industrial clustering was in the spontaneous phase, promoted by SMEs and limited in some county and thus of small scale.

Since 1992, China has established the goal of socialist market economy and adopted more flexible and preferential policies to encourage the development of non state-owned firms. During the ninth five-year plan (1995-2000) and the tenth five-year plan (2000-2005), China's industrial policies further support industrial development and local governments also treat industrial clusters as a means of local industrial development. Take an example, the tenth five-year plan emphasized on speeding industrial reform and upgrading industrial structure, further strengthening infrastructure such as transportation, energy, and water supply, and improving industrial technologies. Chinese government also had enacted some new industrial policies such as Policy on Auto-Industry Development (2004), on Encouraging, Supporting and Guiding the Development of Individual and Private and other Non-public Economies (2005), and Interim

Provisions for Adjustment of the Industrial Structure (2005). It hoped these policies and regulations to promote development of industrial clustering through the private strength and improve the industrial structure. Improvement in macro-economic environment induced the fastly growing up of domestic private firms and FDI to flow into China. Thus, FDI-induced industrial clustering got rapidly increased and at the same time, domestic firms have learned the experiences and lessons from foreign-funded enterprises (FIEs) and become another important force in industrial clustering.

The eleventh five-year plan (2006-2010) is the tuning stage of China's industrial adjustment and transformation. The government will support industries with "new energy, new technology and new machinery." Some industrial projects with high efficiency, little pollution and independent intellectual property rights (IPRs) will be encouraged by authorities while other projects with high energy consuming, heavy pollution and high degree of dependence on foreign technology will be gradually eliminated. However, at the level of macro-economic policies, China has not have a clear policy on industrial clustering for a long time. In order to change this situation, in 2007, State Development and Reform Commission published some opinions on promotion of development of industrial clustering with eight measures to promote industrial clustering.^[1]The government wants to shift traditional clustering of processing and manufacturing industries to the development of innovative cluster, and speedily upgrade the division status of industrial clustering in global value chains.

Accompanied with the adjustment of industrial policies, Chinese tax incentive policies have also been shifted. In the past years, taxation did not get enough importance in the Chinese Government's economic policies. In the 1980s, taxation objectives were to collect necessary tax revenues in an equitable manner. The 1994 reform enhanced the role of taxation as a tool of macroeconomic policy to encourage foreign investment, and make taxation more compatible with reforms of state-owned enterprises (SOEs) and enhance their self-management. Under the 1994 tax system, the core tax categories were indirect taxes levied on goods and services and direct taxes on the incomes of enterprises and individuals. The main indirect taxes were the value-added tax, the business tax, and the consumption (excise) tax levying on different types of firms with different tax rate. Direct tax was levied on the incomes of enterprises and individuals. The enterprise income tax was unusual in that it consisted of two distinct systems, one for domestic enterprises and another, preferential one, for foreign-invested enterprises (FIEs). Whereas domestic enterprises were subject to a statutory income tax rate of 33%, FIEs operating in special economic zones and other zones enjoyed reduced rates of 15% and 24%. In 2007, the Government has unified the tax on both foreign and domestic firms. "Corporate Income Tax Law" in the Fifth Session of the Tenth National People's Congress (NPC) has been ratified. Income tax levying on FIEs is changed from 15 percent to 25 percent, however, the new tax laws for high-tech industries are still kept at the rate of 15 percent.

Since the 1990s, China has had legislation dealing with aspects of unfair competition and specific anti-competitive practices such as collusive tendering. Competition policy in China appeared to deal with a distinct set of challenges posed by the country's gradual transition from a centrally planned to a more market-oriented economy, such as the duality of the economy, the continuing role of administrative and other state monopolies, and the persistence of barriers to internal trade at the first stage of the reform. The Law Countering Unfair Competition has been effective since 1 December 1993, aiming to encourage and protect fair competition, stop unfair competition, and protect the legitimate rights and interests of business operators and consumers. The Price Law became effective on 1 May 1998. The Law on Bid Invitation and Bidding or Tendering, effective 1 January 2000, prohibits collusive tendering.

However, China lacks a modern, comprehensive competition law incorporating broad provisions to deal with cartels, anti-competitive mergers, and abuses of a dominant position. This gap within its legislative framework is filled during the current legislative term (the Tenth NPC) by the adoption of a comprehensive competition law, the Anti-monopoly Law. Its principal purpose is to "prohibit monopolistic conduct." In addition, Article I refers to the objective of "ensuring the healthy development of the socialist market economy." In implementing the new law, it will be important that China ensures non-discriminatory treatment of private enterprises versus state-owned enterprises throughout China; addresses the challenges posed by administrative and state monopolies and other anti-competitive arrangements; and ensures continuing non-discriminatory treatment of foreign corporations operating in China.

As part of efforts to create an investment environment conducive for both domestic private and foreign direct investment (FDI), the Chinese Government attaches great importance to the protection of intellectual property rights (IPRs) over the last ten years. Since the 1980s China has acceded to many of the major international conventions on the protection of intellectual property rights. Before and after its accession to the World Trade Organization (WTO), China took actions to amend almost all IPR-related laws, regulations and judicial interpretations to ensure consistency with the WTO Agreement on Trade-related Aspects of Intellectual Property Rights and other international rules on protection of intellectual property rights.

In the meantime, the Chinese Government set up its priority work to strengthen enforcement of laws to combat IPR infringements. In recent years, patent administration departments at all levels have strengthened administrative enforcement of the law in this respect. Great efforts have also been made to investigate and deal with cases that infringe upon the patent rights of key technologies and cases that had widespread repercussions. At present, the Customs has established a complete system of IPR-related laws enforcement measures. It has established a central filing system for IPR Customs protection. The Chinese Government also attaches great attention to the education of IPRs protection with the aim of raising awareness of the whole society to enhance regular public education throughout the country on IPR protection, to create a

favorable social environment emphasizing other people's work, knowledge and talents, and creation and innovation, and in a nutshell to raise the general public awareness and consciousness of IPRs-related issues. In fact, improvement in IPR fields has encouraged industrial development closely related to IPRs and speeded up the technological transfer from FFEs to domestic firms.

1.2. Trade and FDI Regimes

A great change in China's trade and FDI regimes has been seen over these recent 30 years since China's adoption of an "open door" policy and economic reforms began in 1978. There have been rapid expansion of import and export trade and inflow of foreign direct investment. Total value of import and export rose from US\$509.6 billion in 2001 to US\$ 2,173.8 billion in 2007. China is now the world's third largest trader (after the United States and the European Communities). It has also become one of the largest recipients of FDI, till now total accumulated FDI amounts to US\$700 billion. By the end of 2005, China has all together approved the establishment of 552,942 FIEs. Much many of FIEs tend to locate in economic and technology development zones where they are eligible for preferential treatment.

1.2.1. International Trade Policies

China's trade regime has been increasingly liberalized and structural reforms have been ongoing to introduce greater competition in the economy since 1978. China has adjusted to the export-oriented strategy from "import-substitution strategy" before 1978 and encouraged the public and private firms to export the goods with comparative advantage, and at the same time limited the import goods using the high tariff (the average rate of tariff is 40%) and strict non tariff barriers (NTBs). In 1992, firms have got more power to be engaged in the international activities than before. The whole average rate of tariff decreased to 23% in 1996, 16.7% in 2001. China has also reduced other barriers to imports, notably import prohibitions and restrictions, and simplified the import licensing regime.

In 2001, China entered into WTO and gradually shifted its trade policy from the export-oriented strategy to the balanced trade strategy with adapting to the international rules and regulations and emphasizing the efficiency and fair competition. The whole average rate of tariff decreases to 9.9% in 2005. From 1999 to 2005, the Central Government adopted, revised or abolished more than 2,000 pieces of laws, administrative regulations and departmental rules related to international trade and others.

The trade policy reform creates a favorable climate to greatly facilitate the domestic and international firms to be active in both the domestic and international market. Some leaders from interviewed firms thought that the improvement in the trade environment contributed to their

business. Now China will adjust its foreign trade policy to emphasize high-technology and high value-added exports.

1.2.2. FDI Policies

At the beginning of economic reform in 1979, it is believed that direct foreign investment could bring precious capital and foreign reserve, and also could bring new technology and management skill to China. In the late 1970s and early 1980s, government policies are characterized by setting new regulations to permit joint ventures using foreign capital and setting up Special Economic Zones (SEZs) and 'Open Cities.' In the mid and late 1980s, the opening up gradually stretched beyond the special economic zones to the coastal areas, Hainan Province, and the Pudong area of Shanghai as well as the Changjiang River (the Yangtze River) Delta cities and a series of frontier and interior cities. At the end of 2000, there are 53 national high-tech development parks and 15 exporting processing zones in China. China's proactive policies toward FDI resulted in increasing inflow of foreign capital in the late 1980s and, in particular, early 1990s. At the same time, Chinese government has passed lots of laws related to foreign business, such as Sino-Foreign Equity Joint Venture Law in 1979, Foreign Investment Law in 1986, Sino-Foreign Cooperative Joint Venture Law in 1988, Foreign Enterprise Bankruptcy Law in 1988, Law of Liquidation on Foreign Enterprise in 1996, and Guideline Catalogue of Foreign Investment Industries in 1999. In 2007, Chinese government improved Guideline Catalogue of Foreign Investment Industries. In the reform of investment administration, the approval system of FDI project by investment administration authorities at different levels of the Government according to the amount of investment has been changed. The approval procedure of foreign investment projects has been also simplified with enhanced efficiency.

1.3. Role of Local Governments

In China, the local government has played its important role in helping local industrial cluster grow while the origin of clustering seemed to be natural and out of the plan of the local government just as some studies showed.

At the first stage of reform in the 1980s, industrial clustering has not aroused the attention of local governments since it was not regarded as a tool of the local economic growth.

Till the 1990s, the local government began to pay attention to the appearance of local industrial clusters gradually under functioning of the market mechanism. The local government made its major efforts to build the "hardware" environment and enact preferential policies and measures for increasing the role of the industrial clusters in the local economic growth. In particularly, the local government in the costal regions has its own plan and positively provided services to meet the demand of local enterprises. They enforced the local infrastructure construction, provided the preferential tax incentives, facilitated the enterprises to come in and out the local market, financed

the funds for the local enterprises and established the industrial parks. Take an example, Zhongguanchun software park welcomed the first creation of enterprises to a large degree due to the “special policy of 18 items” issued by the government in May 1988. In addition, the local government provided the preferential policy for technological persons to settle down. In Shanghai, Jiangsu and Zhejiang, the development of industrial clusters is also from contribution of local government. Jiangshu government began to attract FDI in 1992 through the preferential policies to reduce land and tax burden for foreign firms and financed and developed the industrial parks. Zhejiang local government made a great amount of investment to establish all kinds of industrial districts including infrastructure and fixed-capital more than hundred of billions Renminbi (RMB). In the period 1998-2004, Jiangsu and Zhejiang highway mileage increased from 27,331 kilometers, and 38,900 km to 70,141 km and 44,316 km respectively.

Entering into the 21st century, firms hoped the improvement in the “software” environment and the local government began to do it. In order to promote the development of automobile industries, the Shanghai local government defined six leading industries including automobile, and published “Shanghai Directory of Key Industries for Foreign Investment” and “Shanghai Guide for Industries by Foreign Investment” in 2003, and programme of action for giving priority to the development of advanced manufacturing in 2004. Regarding the software development, during “10th Five-Year Plan” period, Beijing has enacted a series of policy favourable for software development, such as “Views on Further Optimizing the Development Environment,” “Beijing Provisions on Further Promoting the Development of High-tech Industries”, “Opinions on the Promotion of Industrial Development of the Financial Capital,”and “Beijing’s Overall Urban Planning (2004-2020).” Now Beijing has developed “the 11th Five-Year Plan of Zhongguancun Science and Technology Park Development Planning from 2006 to 2010.” As planned, in 2010 the value added of software in Beijing would accounts for 20 percent of total local GDP.

The important roles the local government played mainly are in the following aspects: the first role of the local government is the establishment of a market in its physical form. The government is sensitive to realize that the lack of a market had become the constraint on the development of the economic activities and a physical market was in demand. The second role is to provide various preferential policies to attract investment and promote the development of enterprises. Some local governments had adopted policies in the fields of land, taxation, government services for the development of local industry clusters. The third one is to establish industrial parks, making industrial clusters geographically more focused. For example, from the 1980s, the local government has given a great deal of concern in Zhongguancun and a lot of input, Zhongguancun park has become “state-level high-tech industry base,” known as innovative base of 8,000 high-tech enterprises. In recent years, more and more local governments have come to realize the significance of regional industrial clusters in the fields of enhancing the competitiveness, creating a regional environment for innovation, and promoting information

services organizations with the cooperation of local industries, encouraging enterprises to innovate, etc.

Since the improvement in the “hardware” environment, some new challenges faced with the local government emerge in recent years. In fact, the share of services in total GDP is a little more than 40 percent in both Jiangsu and Zhejiang, even the share of Shanghai’s services in GDP is just over 50 percent, compared with those of developed economies (usually over 70 percent share of services in GDP). This indicated the backwardness of the whole economy. In our investigations, most firms thought the “hardware” environment for business and operation has fulfilled their demands while the “software” environment needs further improvement. They expected local improvement in legal system such as IPRs and customs procedures, attraction of high-quality engineers and technologists, even the improvement in local education and cultural environment.

2. CURRENT SITUATION OF THE SELECTED INDUSTRIES

2.1. Automobile Industry in Shanghai

2.1.1. Overview of the automobile industry in China

Shanghai is the largest car production base in China at present. One of the biggest three automobile corporations “Shanghai Automotive Industry Corp” locates here. Shanghai enjoys its fame for Shanghai-Volkswagen and Shanghai-GM as well as the biggest car parts and semi-product production base throughout China. Shanghai is also accompanied with over 50 joint ventures producing car parts and semi-products, which contributes to strong support for car production in Shanghai.

Table 1: Proportion of Automobile Industry Turnover of China in 1998
(% of total items)

	Beijing	Tianjin	Hebei	Guangdong	Shanghai	Jiangsu	Zhejiang
Vehicle	2.95	7.57	0.61	0.84	17.73	5.81	0.38
Refit Vehicle	2.89	0.04	3.6	8.56	2.81	16.12	2.5
Motorcycle	0.03	3.42	0.74	25.46	1.33	17.87	4.21
Engine	5.45	0	0	1.23	1.77	8.28	2.55
Hardware of Vehicle	1.98	0.12	2.83	2.94	28.16	9.41	5.87
Automobile Industry	2.4	4.53	1.31	25.72	15.28	9.39	2.3

Source: China Statistics of Automobile Industry 1999.

Table 2: Proportion of Automobile Industry Turnover in 2001 (%)

	Beijing	Tianjin	Hebei	Guangdong	Shanghai	Jiangsu	Zhejiang
Vehicle	2.08	1.54	0.25	5.17	17.63	3.57	0.82
Refit Vehicle	4.21	0.3	5.63	5.6	3.83	17.46	4.94
Motorcycle	0	1.03	0.7	17.4	0.37	13.4	8.32
Engine	1.49	6.39	1.1	2.73	3.9	4.31	0
Hardware of Vehicle	1.03	2.46	2.5	3.07	27.31	8.74	8.05
Automobile Industry	1.8	1.67	1.22	6.18	15.97	6.95	3.44

Source: China Statistics of Automobile Industry 2002.

Table 3: Proportion of Automobile Industry Turnover in 2004 (%)

	Beijing	Tianjin	Hebei	Guangdong	Shanghai	Jiangsu	Zhejiang
Vehicle	8.33	0.03	1.04	6.08	15.31	2.15	1.1
Refit Vehicle	2.78	0.51	10.43	4.13	1.36	17.69	2.16
Motorcycle	0	5.49	0.1	23.02	0.54	12.05	9.73
Engine	0.6	6.45	3.64	0	5.22	8.65	1.09
Hardware of Vehicle	3.16	3.14	2.7	3.68	18.62	6.87	10.99
Automobile Industry	5.91	1.37	2.1	6.48	13.53	5.27	3.95

Source: China Statistics of Automobile Industry 2005.

According to the tables (see Table 1, 2, and 3), it is quite clear that automobile industry in Shanghai is in the process of agglomeration. Shanghai is in the outstanding situation in automobile production and its support system. Although automobile production decreased from 17.73 percent of total production value of China's automobile in 1998 to 15.31 percent in 2004, Shanghai is still the biggest automobile production base. From another perspective, this change also reflects the automobile production convergence in Shanghai is becoming weaker. Of course it may be because of automobile production gradually shifting to outside Shanghai rather than the actual automobile production decreasing in Shanghai and the production of automobile parts and semi-products also decreasing. However, automobile industry in Shanghai is still the leading one in China. And we can see Table 4, which shows us the superiority to that of other cities in China.

Table 4: Comparison of the Automobile Industrial Agglomeration among Different Cities in

Location	Supporting industry	Local consumers	Enterprise& enterpriser	Geographic priority	Industrial history	Power of MNCs	Marketization	Reform	Level of agglomeration
Shanghai	E	Particular	E	E	E	E	E	E	E
Guangzhou	G	Particular	E	E	E	G	E	E	E-
Changchun	E	Average	E	G	E	E	A	A	E-
Wuhan	G	Average	G	G	A	G	G	G	G-
Beijing	A	Particular	G	E	P	E	A	A	G
Chongqing	G	Average	E	G	G	G	A	A	G
Nanjing	G	Average	G	E	A	P	G	A	G-
Shenyang	G	Average	A	G	A	G	A	A	G-
Tianjin	G	Average	G	E	P	A	A	A	A
Haerbin	G	Poor	A	P	A	P	A	A	A
Jinan	A	Poor	A	A	A	P	A	A	A
Hefei	A	Poor	A	A	G	A	A	G	A
Hangzhou	E	Particular	E	E	A		G	E	G-
Changsha	P	Average	A	A	A	A	A	A	G
Nanchang	P	Poor	A	P	G	A	A	A	G
Liuzhou	E	Poor	A	P	G		A	A	G

China

Note: Reform means the reform of state-owned business. E: excellent, G: good, A: average, P: poor.

Source: Wang xiaoming, (2007), "Study on the development strategy of China automobile industrial agglomeration", Discovery, No.2, p99.

2.1.2. Agglomeration factors

The kind of forward linkage consists of human resource, infrastructure, information sharing & knowledge spillover and development of joint ventures.

(a) Human resource

Shanghai is a well-known metropolis, and many people including talents swarm into this city. The character of metropolis gives rise to two key advantages. Firstly, labor is attracted into the market because the size of the market provides a better chance of continuity of employment. Secondly, the size of the market provides an incentive for people to invest in highly specific skills. Local universities such as Shanghai Jiaotong University, Fudan University, Shanghai University and so

on form a labor pool which guarantees continuous supply of professional labor for automobile industry. Especially the cooperation between Tongji University and Shanghai automobile industrial group gives rise to excellent R&D basis for the automobile industry in Shanghai. As its result, Tongji automobile school promotes the automobile and its related industrial development as the classical pattern of academic-industrial cooperation again.

(b) Infrastructure

In order to help automobile industry in Shanghai, the local government has invested more than 50 billion RMB to build infrastructure, such as Shanghai International Circuit, automobile inspection institute, automobile exhibit street, automobile exhibit park and new energy R&D centers and so on. Rather than these, there are all kinds of association, financial firms and similar "soft" supports in Shanghai. Without any doubt, Shanghai attracts investment including FDI with this wonderful infrastructure.

(c) Information sharing & knowledge spillover

As an international city, there are many institutions providing all kinds of information in Shanghai and thus Shanghai become a center of automobile information. A great number of global large automobile enterprises set their offices or branches here at least to grab latest information or acquire related knowledge.

(d) Development of joint ventures

Both of the advanced infrastructure and municipal management give rise to the increasing joint ventures. In turn, these capitals help local automobile SMEs develop rapidly and agglomerating around the large-scale automobile enterprises in Shanghai.

The following factors belong to the backward linkage:

(a) Local demand

Shanghai locates at the richest area (Jiangsu, Zhejiang and Shanghai) of China, whose GDP increased to 2,877.5 billion RMB in 2004, accounting for 21 percent of total China's GDP. The GDP per capita has increased to 4,247 USD, above the 3,000 USD UN modernization line. All these data show that there is a large and potential automobile market in the Yanzi Delta River.

(b) Particular consumers

Against the local high GDP per capita, the local automobile consumers also become experienced with their automobile consumption. After over 20 years open-up, the consumers living in the coastal area are used to all kinds of novelties, and they are becoming familiar with these new staff. Especially as for the automobile consumption, the local consumers become experienced and particular with automobiles. Some of them even are experts in the field. Their demand or preference is the direction of automobile provided by any automobile suppliers. In order to satisfy

these experienced consumers, many automobile suppliers invest in this coastal area to face their consumers directly.

(c) Communication and domestic market

Almost no respondent of our interviews can deny their ambition towards the potential automobile consumption market in China. Most of the respondents said that they are attracted to invest here by the large market of China. Against the slow growth of the global economy, the China miracle is really outstanding. Many automobile attach much importance to China market. The Shanghai's geographic site provides a good way to deliver these heavy goods by sea or river rather than land traffic. Fortunately there are many advanced waterway traffic in addition to network of highways and railways. All these advanced traffic systems contribute a lot to the automobile agglomeration in Shanghai.

(d) Supporting industries

Automobile industry is one kind of heavy industry whose development needs other industrial sectors supporting it in addition to good infrastructure and other production factors. According to one non-Asian automobile supplier respondent, the automobile plant was located in Shanghai 20 years ago mainly because of the relatively advanced local industrial base and development of industries supporting it, which would reduce the cost of input and production largely. In fact, Shanghai's automobile industry is supported by petrochemical industry in the south of Shanghai, steel industry in the north and electronic industry in the east. Both leading and supporting industries form an integrated industry chain of Shanghai's automobile.

(e) Competition and government behavior

According to the data and facts, the automobile sale competition in Shanghai is fierce. The competition here is beyond price competition, including quality competition, service competition and brand competition. In order to get some share of auto market, a lot of famous international and local auto firms gather in Shanghai, which is a cause of automobile industrial clustering. Shanghai government has done a lot to attract FDI. One of the respondents said that when the company decided to invest in the suburb of Shanghai, the local government is quite efficient to build infrastructure and specially paved a road for the automobile plant.

2.1.3. De-agglomeration

According to the data and interviews, there is a noteworthy trend. With the rapid development of Shanghai's economy, the city is becoming more and more crowded, and the traffic jam is fairly serious without considering the surging land cost and increasing labor cost. The centrifugal force is becoming stronger and stronger. As a result, the concentration ratio of automobile industry in Shanghai is keeping decreasing. Anyway, the trend of agglomeration still outweighs de-agglomeration.

2.2. Electronic and Information Industries in Province of Jiangsu

The electronic and information industry in Jiangsu has already developed into a large-scale industry based on industrial specialisation with high proportion of foreign investment. It has become a strategically supporting industry to promote local economic growth and upgrade the structure. In 2006, total sales revenue in electronic and information industry amounted to 879.3 billion RMB, increasing 31.6 percent compared to last year. Among them, sale revenue from electronic and information products manufactured got to 846.1 billion RMB, increasing 30.2 percent compared to the last period, accounting for above 20 percent of the country's total revenue. The sales revenue from the software industry got to 51.2 billion RMB, increasing 60 percent compared to the last period and occupying 10.6 percent of the national one. The total amount of both profits and taxes sourced from the local electronic and information industry was 52.7 billion RMB, increasing 45.4 percent compared to the last period, and among them, profits and taxes from local software industry amounted to 12 billion RMB, growing up to 71.43 percent compared to the same period, accounting for 22.8 percent of the local electronic and information industry. The local electronic and information industry exported 64 billion US dollars, increasing 25.6 percent compared to the last period, and occupying 40 percent of the local total export. Its value added achieved 194.6 billion RMB, occupying 9.7 percent of the local GDP.

2.2.1. Agglomeration of Electronic and information Industry in Jiangsu

The agglomeration of the electronic and information industry in Jiangsu is of high convergence, relatively perfect supporting sectors, and of low and middle level of manufacturing process.

(a) Scale of Industrial agglomeration

The sales from the electronic and information products manufactured (at the time of China's accession to WTO) rose from 157.1 billion RMB in 2002 to 846.1 billion RMB in 2006, the annual average growth of 52 percent. Its share of the national sales went up from 14.4 percent in 2002 to 20 percent in 2006. The electronic and information product manufacturing industry has developed from the four traditional products (integrated circuit, computer and ancillary equipment, modern communications and digital video & audio) in 2002 rapidly into six products (software and panel display besides the traditional four products). The share of sales from these products of the local electronic and information industry rose from 64 percent to 70 percent.

The integrated circuit sector has been formed primarily an integrated industrial chain made up of designing, manufacturing, sealing and its matching material. Some products hold big share in the international market and become a big production base in China and even in the world. For example, the display output, the laptop output, the integrated circuit output, and the mobile phone output account for 50 percent, 40 percent, above 30 percent, and 11 percent in China respectively, and the first two for a quarter in the globe respectively.

(b) The geographic distribution of Industrial agglomeration

After recent years of the development, the degree of industrial clustering in the local electronic and information industry, especially in the South of Jiangsu, has been improving obviously, and now a new agglomeration belt has been gradually formed along the Shanghai-Nanjing railway line of both sides extending about 50 kilometer width and approximate 200 kilometer length with seven provincial-level electronic and information industrial bases.[2]

The Jiangsu electronic and information industrial clustering stemmed from the spontaneous actions of local electronic and information firms, and got its development through governmental measures of improving infrastructural facilities, optimizing investment environment, enhancing matching capacity. Within industrial districts, the proportion of output from the electronic and information industry basically achieved or surpassed 50 percent of the whole output in the district, even above 90 percent achieved in the Wu Jiang development zone. The sales of the industry in these seven industrial parks has surpassed 75 percent of the totally provincial sales.

(c) The characteristics of clustering sectors

Differential industrial districts have their own characteristic of products. The Suzhou high and new technological zone mainly concentrates on producing the computer and its peripheral products while the Suzhou industrial park has the remarkable superiority in integrated circuit and TFT LCD products. Mt. Kun development zone is an important production base of laptops where there are 6 factories of the 10 biggest laptop Taiwanese producers to settle down. Wu Jiang development zone becomes the base of the whole Taiwanese electronical products. Japanese semiconductor factories are gathered in Wuxi high and new technological zone. The software industry is crowded in Nanjing Pearl-River-Road science and technology garden.

(d) The typical developmental model of Industrial clustering

The Suzhou pattern is one typical FDI-induced export-processing economy. In the 1980s, the Suzhou economic growth was led by in fact the village- and town-owned enterprises with labor-intensive products under the direction of the village government. After 1992, Suzhou took advantage of the opportunity as a result of Shanghai Pudong development to attract FDI to promote the rapid development of the processing trade. Afterwards Suzhou's export products were also gradually shifted to the mechanical and electronic products. Starting from the late 1990s, Suzhou held the opportunity that Taiwanese firms were prepared for shifting their production of electronic and information products to the Yanzi River Delta and attracted Taiwanese firms positively to locate there through establishing export-processing area. Therefore Suzhou's electronic and information industry got great strength and also upgraded Suzhou's

industrial structure rapidly. However, Jiangsu's development is a pattern of importing completely or partially raw materials and machinery parts, processing and assembling them and then exporting the finished product again, which can be called as one pattern of "both ends facing outward" and relying on manufacturing primarily.

2.2.2. The role of FDI in the agglomeration of Jiangsu's electronic and information industry

(a) Overview of FDI in Jiangsu's electronic and information industry

FDI has played an important role in Jiangsu's electronic and information industry. In 2006, FDI actually invested 3.4 billion dollars in Jiangsu's communication facility, computer and other electronic installation manufacturing industry, growing up to 26.8 percent compared to last year. The export of electronic and information products achieved 489.9 billion RMB, growing up to 25.6 percent compared with the last year.

Figure 1: The Actual Use of Foreign Capital in Jiangsu's Electronic and Information Manufacturing Industry

Source: Statistical Yearbook of Jiangsu 2007.

In 2006, the numbers of large-scale foreign invested firms in the electronic and information industry increased 135 amounting to 1226, growing up to 12.4 percent compared to the end of last year, accounting for 45 percent of total number of all enterprises located in Jiangsu overall industry. The total employment in the industry comes to 990,000, accounting for 77 percent of the entire employment overall industry. The sales revenue was up to 679.2 billion RMB, increasing 26.9 percent and accounting for 80.3 percent of the total sales overall industry. The firms got the profit of 25.6 billion RMB, increasing up to 46 percent compared to last year, accounting for 79 percent of total profit overall industry.

Figure 2: Share of Foreign-funded Enterprises in Total in Jiangsu's Electronic and Information Industry in 2006 (% of Total for Each Items)

Source: Statistical Yearbook of Jiangsu 2007.

(b) The role of FDI

FFE in Jiangsu's electronic and information industry play a big role in promoting the local industrial agglomeration.

Firstly, FFEs' investment is helpful to form the integrated industrial value chain. After large-scale MNCs are attracted by the good local environment created by the local government, their suppliers from upstream and downstream, their dealers and their specialized service providers will also follow them and support them along the industrial value chain. For example, after

Taiwan's BenQ computer invested Suzhou, it led to a large amount of matching enterprises such as Logitech to invest the mouse, keyboard, mother chip, screen, CD-rom, scanner in Suzhou and form an integrated computer industrial chain in Suzhou.

Secondly, the investment from their rivals of FFEs are helpful to expand the local scale of the local industrial agglomeration. The competitors to large-scale MNCs usually enter the same product market to maintain the competitive situation. The most prominent phenomenon is Suzhou's TFT-LCD industry (film crystal casts liquid crystal display monitor). As AU Optronics (AUO), the third biggest LCD company in the world, invested in Suzhou, Samsung, the first largest, also started to build TFT-LCD factory there. In addition, the second largest LG-Philip, the ninth largest Chuanghwa Picture Tubes and the tenth largest Hannstar and so on also invested in Jiangsu. This kind of industrial agglomeration led to Jiangsu's rapid development into the important global manufacturing base of liquid-crystal screen.

Thirdly, excessive absorption of FDI will cause crowding-out effect on domestic market to the local privately-operated economy. FFEs crowd out local private companies' access to production elements such as capital and talents to affect the local private enterprise's growth. For example, a survey on FFEs' capital sources suggested that although FFEs' capital in the form of cash comes from basically overseas, about 60 percent of them raise floating capital from domestic banks. FFEs do not have difficulties in accessing bank loans compared with the local private enterprises who have inferiority access to the bank loan.

2.2.3. The relationship of electronic and information industry to other sectors

(a) High Dependence of Industrial agglomeration on infrastructure

The seven electronic and information industrial bases in Jiangsu are located along Shanghai and Nanjing railway line. They treat the industrial park as the foundation platform to develop. This indicates that convenient and perfect infrastructures are the common and fundamental condition in helping Jiangsu's industrial agglomeration. However, the relationship of the electronic and information industry with other traditional manufacturing industries is not intensive each other and the former development has the obvious independence from the other sectors. Thus the electronic and information industry can run their own operation in a relatively closed industrial park. That is why the large amount of electronic FFEs can take "the administrative enclave" as the characteristic and develop rapidly in the local.

(b) The local electronic and information industry demanding more support from upstream such as research institutions

FFEs are more likely to retain its core technologies in the parent company and only emphasize their R&D on meeting the demand of local market. Different from FFEs, local private-owned firms have a relatively weak R&D ability, particularly in the field of electronic and information

manufacturing that needs high-tech research and development (R&D) as important supporting condition. Under the pressure of competition from FFEs with technical superiority, local enterprises have to depend upon the domestic scientific research strengths, or perhaps purchase existing achievements of domestic scientific research institution, or conduct the R&D cooperation with the scientific research institutions. The interview with several leaders of local electronic enterprise in Nanjing also proved the above.

The newly developed Yangzhou State-level lighting industrial base is also gradually developed under the cooperation between the electronic manufacturing firms and the related scientific research institutions. Yangzhou has developed the high and new technological industrial park where more than 20 core enterprises are engaged in the semiconductor illumination production, forming more integrated industrial chain of raw material in the upstream, chip manufacturing in the middle, and seal and its mould and bracket for the seal in the downstream. At the same time, a new lighting industrial park has been constructed in the Yangzhou economic development zone where there are R&D institutions such as the Yangzhou-Southern University Electro-optic Research institute, Yangzhou's semiconductor lighting R&D center, Jiangsu's semiconductor luminescent device and quality surveillance and test center. These provide the technical support for the local industrial development.

2.3. Textile and Apparel Industry in Province of Zhejiang

Zhejiang Province is a major producer and exporter of textile and clothing in China. At the provincial level, the textile and clothing industry also holds a big share in Zhejiang's total industrial production as well as its export trade. Since the reform and opening up, Zhejiang's textile industry has developed quickly. In 2006 with its sales revenue of 565.9 billion RMB, export of 30.8 billion USD, net profit of 22.5 billion RMB, Zhejiang's textile industry accounts for 21.06 percent, 20.9 percent and 24.97 percent of China's total textile industry respectively.[3]

2.3.1. Industrial Linkage of Zhejiang's Textile Industry Cluster

The driving force of Zhejiang textile industry at the initial stage used to be its abundant labor resource. After founding of the People's Republic of China, Zhejiang hardly received any large-scale investment from the central government. As a result, its most areas of the province, especially the rural areas, can not benefit from the large-scale industries located in the urban areas, nor rely on state technology and capital to develop local industrial sectors. Thanks to the reform and opening up, farmers can seek development opportunities by their own. Textile industry is labor intensive, on the other hand, Zhejiang is one of the most populated provinces in China, with a large rural population in a very few arable lands. Thus it is not surprising that Zhejiang people found their opportunities in textile industry, which would not ask them for too much capital and technologies.

Zhejiang's textile industry has formed a comparatively completed forward and backward industrial linkage based on division of labor. When Zhejiang textile industry maintained a high growth momentum, its product structure as well as its regional distribution structure improved a lot, and the market shares of its major products also increased dramatically. For example, in the fields of producing printing cloth, pure chemical-fiber cloth, shade cloth, nylon fiber, polyester filament yarn, silk fabric, woolen cloth, knitwear cotton fabric, knitwear cotton garments, shirts, business suits, ties, and socks, Zhejiang is holding either the first or second position as one of the largest producers in China. During the long period of development, Zhejiang textile industry gradually evolved an industrial structure with large-scale textile enterprises or groupings in the urban areas being combined with the SMEs textile enterprises clusters at the county level. This structural character can be shown in the chemical-fiber industries in Shaoxing and Xiaoshan, clothing industries in Wenzhou and Hangzhou, shirt and socks production in Zhuji and Yiwu, tie production in Shengzhou, knitwear cotton industry in Xiangshan, knitting industry in Changle, decorative cloth production in Yuhang and Haining etc.

Zhejiang textile industry has already outsourced raw material while still maintains the whole downstream linkages within the region by producing the final consumption goods like garments. Zhejiang was historically an important producer of mulberry raw silk in China, as a result, silk weaving industry there has a long history with sharp competitive edge against the rest of China. However, in recent years, with its rising labor cost and success achieved by ever economically backward areas like Sichuan and Guangxi Province in mulberry raw silk production, Zhejiang's silk industry began to seek new sources of raw material supply in western area. In addition, improvement of transportation infrastructure also helped easing the restrictions set by natural resources on location decision. Such a situation also happened to the similar industries. In our investigation, we noticed, a feather clothing factory has invested huge money in establishing a goose-raising farm as well as a feather clothing production facility in Internal Mongolia Autonomous Region. It also expressed that it would no longer expand production scale in Zhejiang.

At present, Zhejiang has to meet its demand for chemical fiber from outside sources, either by purchasing from other domestic producers or importing from international markets. After that all the processing and producing activities including production of the intermediate goods and the final goods like costume, ties and socks etc., will be carried out within the province. At each important production stage, lots of SMEs will join in and form an industrial chain characterized by effective cooperation among them. For instance, in Xiuzhou district of Jiaxing municipal, there is a chemical fiber textile cluster. From raw material production (filament fiber), machine equipment manufacturing, to weaving, printing, flocking, and sales, we could see independent enterprises at each stage. These enterprises are closely combined with each other by the linkages in the production chain, and consequently form a relatively complete regional division of labor. With all

their upstream partners (gray silk producers) and downstream partners (silk-made costume and clothing) locating in the neighboring areas, the silk printing enterprises observed by us exactly fall into this group.

According to the form of current industrial cluster, depth of industrial cluster is closely related to capital intensiveness. For chemical fiber industry is highly capital-intensive, it also agglomerates to a highest degree in the province. The sales revenue of the first three largest enterprises accounted for 63.3 percent of the total in chemical industry, while the number was kept below 25 percent in other industries with lower capital intensiveness like clothing and fabric manufacturing sector.

2.3.2. Role of FDI in Zhejiang's Textile Industry

From 1980s to 1990s, the total number of FDI attracted into Zhejiang's textile industry was very small. During this period, local private enterprises played a dominant role in industry clustering. Many specialized towns in Zhejiang were internal-oriented, mostly relying on development of individual economy. In 1980s when Zhejiang's private textile industry just got its start-off, almost all of the enterprises were small-sized with low technological level, local infrastructure was also very poor, and products were only sold in the local market.

Due to its abundant cheap labor resource and comparatively improved corollary downstream industries, added by effectiveness of industrial cluster in some areas, foreign investors put their investment mainly into labor-intensive textile industry and its downstream processing links, other than capital- or technology- intensive links of upstream industrial chain like technology and design innovation.

However, with Zhejiang's textile and clothing industry progressing well, it gets more and more market share. Now its products not only hold a big share in domestic market, but also clime into the international markets. Especially when China entered into WTO, European Union (EU) and the United States began to open their markets for China's textile products by canceling or reducing quota restrictions, more and more foreign investors showed interests in China's textile industry. At present, one fifth of actually utilized FDI in China's textile industry is located in Zhejiang.

Figure 3: Geographic Distribution of Actually Utilized FDI in China's Textile Industry in 2006

Source: FDI Division, Ministry of Commerce.

Figure 4: Actually Utilized FDI in Zhejiang's Textile Industry and its Share in Total Provincial FDI

Source: Foreign Trade Bureau of Zhejiang Province.

Restricted by objective conditions, FDI used to form joint companies with domestic capitals at the beginning. And then, with China loosening its restriction of FDI holding rate and improving its investment environment, sole proprietorship became dominant form of FDI. Some foreign investors believe, that end of quota restriction will give a high estimate of China's textile product exports, for this reason, China's demand for raw material like fiber will increase by a big margin, so to its demand for medium-high grade fabric. Thus, foreign investors begin to set up new enterprises or purchase local ones in order to grasp the opportunities left for China in the post-quota era.

As for influence of FDI on development of China's textile industry, firstly, inflow of FDI helped upgrading the industrial structure of Zhejiang's textile industry. The competitive advantage of Zhejiang's textile and clothing industry mainly comes from its cheap labor cost while it holds a weak position in the capital-intensive or technology-intensive sectors like fiber production. Before the mid 1990s, with weak private enterprises and rigid policy environments for FDI, most FDI in Zhejiang's textile industry flew to the state enterprises that produced chemical fiber. Since then, facing increasingly fierce competition in textile industry, FDI gradually moved to capital- and technology-intensive sector like fiber production. To some extent, such a change of FDI helped enhancing China's textile industrial structure.

Secondly, FDI promoted foreign trade of China's textile industry. FFEs hold an important position in export and foreign exchange earning of China's textile and clothing industry. In recent years, almost one third of exports were made by the enterprises in three forms of Sino-foreign joint ventures, Sino-foreign cooperative enterprise, and FFEs. Now, most of the exports of clothing were made by FFEs in China, which just conducted processing trade or original equipment manufacturing (OEM). This could be mainly attributed to the weak performance of our textile and clothing industry in its upstream links like design and brand building. As a result, local enterprises only through the technologies, designs and brands brought by FDI could get access to the international markets.

2.4. Software Industry in Beijing

2.4.1. Introduction

The software industry in Beijing locates in the Zhong Guan Cun (ZGC) Area of Beijing, where a great number of innovative firms are concentrated. In general, there are more than 18,000 firms in this area, which is composed of SMEs, private-owned firms and high-tech firms mostly.

Specifically, the firms are quite different from those outside the area,

(a) Business Size

Most of the firms in the ZGC Area are SMEs. And it is a true story that there are few big firms. From the perspective of concentration degree (the share of the top 20 firms of the total industrial revenue), the average concentration degree of the six leading industries in this area (software, integrated circuit, computer & network, communication industry, bio-pharmaceutical industry and environmental new energy sources industry) is 64 percent. Software ranks lowest and its revenue of the top 20 firms in this field account for 38.7 percent of the whole industry.

(b) Capital Structure

Private-owned firms form the majority in the ZGC Area while in some specific field, foreign enterprises play a leading role. For example, from the perspective of revenue, foreign enterprises account for 33 percent of total industrial capital, the state-owned firms account for 3% and the private-owned firms account for the rest. In conclusion, software industry is highly marketized.

(c) R&D

Due to the character of the high-tech industry, the R&D input increased to 22.49 billion RMB in 2005, which equals to 27.9% of the total input of the nation's high-tech zones. And the software industry input 6.1 billion RMB, which account for 11.7% of the value of the software output. In addition, the R&D of the software industry ranks top among the six industries in the area.

Table 5: The Leading Six Industries in the ZGC Area

Industry	Software	<u>Integrated Circuit</u>	Computer & Net	Communication	Bio-pharm	New energy
Value of output (billion)	52.258	10.22	73.9	80.085	30.928	48.465
Proportion	10.70%	2.10%	15.15%	16.42%	6.34%	9.94%
Employment	139,653	11,743	86,573	40,011	54,959	54,385
R&D(billion)	6.1	0.595	3.082	1.11	1.215	1.097
Patent issued	306	99	80	267	344	263
Capital structure	PO, SME	PO	SO	FE	PO	PO
Concentration degree(CR20)	38.70%	56.20%	64.90%	87.40%	59.90%	76.80%
Number of big firm	4	3	9	7	7	13
Local leading firm	NO	NO	YES	NO	YES	YES
Status in field	leading	Leading, challenged	leading	leading	leading	leading
Academic background	9 labs		R&D centers	Labs and R&D centers	9 labs	8 labs
Association	3	1		2	1	3

Notes: PO: private-owned firms, SO: state-owned firms, FE: foreign enterprises.

Big firm means the firm whose revenue is more than 1 billion RMB.

All are of 2005.

Sources: ZGC Administrative Committee.

2.4.2. Agglomeration Factors

(a) Source of Knowledge and Innovation

Most of our respondents said that their original major target to invest in Beijing is to obtain the enormous advanced knowledge and innovation from vast academic institutes and universities in Beijing. To be straighter, many software firms are originally or derivatively based on the academic organizations. ZGC Area is famous for a great number of the top universities of China, national laboratories, national engineering centers, and national engineering technology research centers. ZGC ranks top for its innovation ability.

There are 68 universities including Tsinghua University and Peking University and other 270 scientific research institutes including Chinese Academy of Sciences (CAS) in the pan-ZGC Area. Especially, there are 51 national laboratories covering 28% of the total national laboratories, 22 national engineering centers, 20 national engineering technology research centers, 13 nation-level enterprise technology centers, 11 nation-level professional bases and 65 R&D centers founded by MNCs as well as many local R&D centers. The core attracting factors for most local software firms to agglomerate in Beijing is the above think tanks.

Table 6 Statistics of Scientific Research Sources

Source	Number	Remark
University	68	
National laboratory	51	28% nationally
National engineering center	22	20% nationally
National engineering technology research center	20	19.8% nationally
Nation-level enterprise technology center	20	till 2005
Nation-level professional base	11	till 2005
R&D center founded by TNC	39	till 2005
Public laboratory	8	till 2005
Public technology supporting flat	7	till 2005
Incubator	46	till 2005
University technologic park	11	till 2005
Professional park	9	till 2005
Industrial base	7	till 2005

Source: Chen Xiaohong, Ma Jun, Yuan Dongming (2007), *Consortium and Innovation*, Beijing: Economic Science Press, p53.

Scientific research sources in ZGC not only provide all kinds of knowledge and technology needed by local firms, but also human resource of over 500 academicians and 100 thousand graduates. The 11 university technologic gardens facilitate local firms to acquire innovations from universities and also build a bridge to link research projects of universities with market. This kind of interaction between academies and industry exerts its push to software industrial agglomeration in Beijing.

(b) The Labor Market

The labor pool from which the Beijing software industry cluster can draw is clearly one of its greatest assets. The pulling power of Beijing's fluid labor market is one of the most important engines of cluster dynamism. While foreign respondent did comment on the negative effects of mobility, such as the bidding up salaries and losing key staff to competitors, the disadvantages of mobility seem to greatly outweigh the advantages. But in fact, there is a general tendency for software to rate these labor market advantages more highly than other firms.

The existence of a large labor market in a cluster gives rise to two key advantages. Firstly, labor is attracted into the market, because the size of the market provides a better chance of continuity of employment. Secondly, the sheer size of the market provides an incentive for people to invest in highly specific skills. As Adam Smith so penetratingly observed over 200 years ago, the division of labor is limited by the extent of the market.

Beijing offers a wide array of career opportunities both within large firms and through the ability to move easily between employers. Several firms spoke of the problems of attracting top talent if they were in the regions. This is part of a classic self-sustaining process in clusters. What impressed us most is that the mobility of the talent in this field is quite high. One respondent of a major global firm said that his firm is always disturbed by the talent mobility. He said that the loyalty to the firm is one of his targets to set up in the talent-growth program and trainee program. While most Chinese firms benefit from this kind of mobility. Most of the local firms are in great need of experienced management, but they are faced with a brand-new market and no one can guide them. Therefore, many foreign competitors are becoming one source of the management talent for vast the local firms.

Another feature is the ability of staff to gain experience in Beijing and these acts as a means of transferring best practice internationally. The special Capital character of Beijing's labor market in recruitment indicated two main trends. Firstly, most labor is recruited from all over China. They long for the high-tech culture climate in Beijing and most of these young people hope to make a metropolitan living in Beijing. Secondly, Beijing is one center for global software firms to locate. The production network, local recruitment in addition to cooperation with local firms provide a way for local employees to acquire excellent software skills and experiences. Through this mechanism, Beijing is going into a process of self-reinforce software industrial agglomeration.

(c) Favourable policies

The majority of the software industry is SMEs, so for that reason they care about all kinds of favourable policies which may give incentive to their business. From our interview with firms, we clearly find that SMEs attach much importance to favourable policies while foreign big firms care little about this factor. However SMEs, the majority of software industry agglomerate in Beijing partly for these policies.

ZGC Administrative Committee provides loans for SME and initial financial help to set up an SME as well as “Gazelle Project” for high-growth SME and so on. Especially many banks, insurance companies, venture capital, and security companies have set up their office in ZGC area, contributing 820 million US dollars to 111 SMEs in ZGC from 2003 to 2005.

ZGC Technology Credit Guarantee Company is a politic credit organization sponsored by government. It has supported 11.6 billion RMB for SMEs in ZGC. It contributes a lot in agglomeration in ZGC.

“Patent Engine Project” plays an important role in helping local SMEs to create, utilize and protect business patent. This project strengthens SME’s core competitiveness and gives much incentive to agglomeration.

China is one of the biggest and promising markets in the world and no one can ignore her. As her Capital, Beijing is also famous for its large market advantage.

Firstly, most headquarter of domestic large companies and Asian affairs headquarters of TNCs locate in Beijing. There are 126 out of 160 central business to settle down their headquarters in Beijing till the end of 2006. And many companies of China top 500 businesses come from Beijing. All these large purchasing power contribute to agglomeration in Beijing for market-oriented software firms.

Secondly, Beijing is blessed with Government purchase, which is an incomparable advantage over other cities.

Thirdly, as a metropolis, Beijing itself provides a big market demand. All kinds of infrastructure construction, citizen consumption, nation-wide and international activities, and all these activities form a wonderful demand for software.

In order to get better communication, software firms set up many associations and consortia. These kinds of organizations have done a nice job in providing professional industrial services and solve common industrial problems. We have to mention that most headquarters of these organizations are located in Beijing, so it is obviously more convenient for software firms to locate in Beijing rather than in other cities to obtain professional help and support in addition to knowledge spillover and human relationship.

3. POLICIES IMPLICATIONS

In this paper, the development of industrial clustering of automobiles, electronics and information, software and textile and apparel in China is investigated through using the second-hand data and direct interviews. Some empirical factors taken into account the cluster performance include the historical and natural origin, the role of local governments, macroeconomic policies and FDI in some industries. During the past 20 years, China's industrial clusters have grown up in terms of quantity (number and scale of enterprises) but also in terms of quality (equipment, products, variety, marketing and management). It can be anticipated that these clusters will continue to contribute to the economic growth and industrial development of the local economy.

The opening and stable macroeconomic policies create a favorable climate for the industrial clustering. In particular, the preferential policies towards FDI accelerate the inflow of FDI and concentrating in coastal regions. Without this background, Chinese industrial clustering could not be developed rapidly and maturely.

Industry clustering depends highly on local infrastructure, including both "hardware" and "software" infrastructure. Take an example, industrial bases or industrial parks in Jiangshu are located along the railway easily accessing to the convenient and improved transport infrastructure. Another example, development of Beijing software parks is indispensable on universities nearby. During direct interviews, managers generally reflect they are satisfied with the "hardware" infrastructure and also hope the local government to improve the local "software" infrastructure.

The major contribution of FDI to the local industrial clustering lies in helping integrating Chinese domestic industries into international division and at the same time forging a relatively integrated production chain. When some region creates conditions favorable for attracting foreign investment by large MNCs, its upstream and downstream suppliers, distributors and professional service providers will also be entered in the industrial chain to form a kind of integrated clustering. Moreover, competitors to MNCs will follow up competitive investment strategy which may be conducive to the expansion of the scale of industrial clustering.

In the future, some considerations on Chinese industrial clustering need to be given. Some studies indicated that government preferential policies today have not been again the dominant factor to attract FDI in the costal region. FDI may pay more attention to the degree of the local industrial clustering itself, which means the relationship among FFEs, local firms and local government enters into a new unprecedented historical period.

Firstly, it is necessary to develop national strategies and policies for industrial clustering in detail. Formulating strategy and policy for industrial clustering development is the common trend in today's world development. The government should develop and implement a national plan for the development of industrial clusters and design indicators to identify and classify industry

clustering. Local governments can integrate all aspects of resources to clear the market channels for enterprise, expand clustering visibility in the international and national fields, and provide professional services such as products Expo and Trade Fair.

Secondly it is necessary to strengthen the role of social networks and intermediate organizations. The developed social network is the basis of formation and development of industry clustering. The increasing capacity of social networks and intermediate organizations in China can relieve the local government from the specific management services to concentrating on forecasts, the macro-management, and supervision of industrial development. It is necessary to encourage cooperation between companies and universities or research institutes to strengthening technical training, technical support and market information. In addition, the construction of information and consultation services should be accelerated and all kinds of social organizations, especially those with supervisory or notarization institutions, the arbitral institutions, accountants, auditors and other social intermediary organizations should be cultivated.

Thirdly it is necessary to promote industrial parks to become the birth place of industrial clustering. Industrial park is a commonly used tool for regional development policy to provide enterprises with some external environmental conditions. Currently, China has built a large number of development zones, high-tech zones and various types of industrial zones. These industrial parks are basically playing a role of agglomeration effective. However, these industrial parks are of mixed types, lack in specialized division of labor and closer economic ties among them. Industrial clustering should become the future direction of industrial parks.

Fourthly, it is necessary to support the development of the industry matching to the leading industry to attract all kinds of investment. In China, the linkage between FDI and local firms needs to be improved in the future. Many local industries still is faced with the "lack of rooted" problems. The local government should pay attention to policies conducive for the technological linkage between upstream and downstream industries.

Fifthly, it is necessary to take stringent measures to reduce costs of the development of the cluster from the "social cost" point. The local government system should pay attention to good social order, such as "everyone honest" credit environment and cultural environment for business to attract talented persons of all kinds and both domestic and foreign firms to cluster locally.

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[1] These eight measures are Strengthening scientific planning, optimizing regional and industrial distribution; upholding conservation development, and improving the efficiency of resource use such as land; improving the leading enterprises, expanding the level of professional collaboration, strengthening the ability of independent innovation, and upgrading the industrial level; and promoting the development of recycling economy and ecological-oriented industries; vigorously implementing the brand strategy, actively cultivating regional brands, vigorously developing services industries related to production, improving the social service system; modeling and guide industrial transformation across regions.

[2] These are Suzhou newly developed area, Suzhou industrial park, Nanjing-Jiangning development zone, Wuxi newly developed area, Mt. Kun development zone, Wu Jiang development zone, Nanjing Pearl River road technology zone.

[3] <http://www.sinotex.net/news/shownews.asp?id=66447>