貿易學碩士 學位論文

중국의 IT 산업과 FDI 정부 정책

On The IT Industry and Government Policy Related with FDI in China

指導教授 兪 日 善

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韓國海洋大學校 大學院

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<국문초록>

중국은 1978년 개혁개방이후 빠른 경제성장을 경험하고 있다. 이러한 경제성장에 필요한 자본을 외국인 직접투자(FDI)형태로 조달하였다. 초기 경제성장은 중국의 저렴한 노동과 외국자본을 결합하여 가공무역형태로 진행되었다. 어느 정도 경제성장을 이룩하자 중국정부는 경제성장을 좀 더 기술집약적이고 자본집약적인 산업으로 질적인 전환을 시도하였다. 이 과정에서 IT산업은 중국의 전략산업으로 부각되었다.

중국정부는 IT산업의 기술흡수 목적을 염두에 두고 더 많은 FDI를 유도하기 위해 합작투자형태 위주의 투자방식에서 독자소유기업을 허용하는 방침을 발표하였다. 독자소유 형태로 전환한 다국적기업들은 기술을 보호하기 위해 자체의 R&D센터를 설립하는 등 다양한 형태의 경영활동을 펼쳤다. 이러한 활동들이 중국경제의 입장에서 보면 여러 가지 문제점을 노출하였다. 첫째 거대한 소비시장과 정부우대정책으로 인해 다국적 기업의 과잉투자가 이루어져 초과생산설비를 갖게 되었다. 둘째 다국적기업들의 과도한 기술보호로 중국의 기술파급효과(technology spillover effect)가 기대수준보다 낮았다. 셋째 FDI투자의 불균등이 심각하다. 동부해안 중심으로 FDI투자가 집중되어 지역격차, 소득격차 등 다양한 불균형현상을 초래하였다. 넷째 심각한 환경문제를 발생하였다. IT관련 제조품을 생산하는 과정에서 유독가스, 환경오염 등 유해물질을 무분별하게 방출하여 국민건강에 해를 끼치고 있다.

이러한 문제를 해결하기 위해 다음과 같은 개선점을 제시한다.

첫째 정부는 정책가이드를 강화하여야 한다. 전문가고용문제, 정부우대정책, 환경문제와 기술이전 등 중요 사안에 대해 모호한 지점이 없도록 명확히 가이드라인을 정하고 홍보해야 한다.

둘째 다국적기업의 활용방안에 대해 강구해야 한다. 중국현지기업과 다국적 기업간의 어떤 전략적 제휴가 유효한가, 어떻게 다국적 기업의 R&D활동에 참여할 수 있는가 등에 대한 방안을 모색해야 한다.

셋째 기술파급효과를 최대화하기 위한 정책을 모색해야 한다. 기술파급효과가 큰 기술을 갖고 있는 다국적 기업이 중국기업과 합작투자방식을 택할 수 있도록 과감한 우대정책을 펼쳐야 한다.

넷째, 중국현지기업의 기술혁신능력을 배양해야 한다. 중국 자체 내 과학기술연구센터를 설립하여 신기술을 창출할 수 있는 인프라투자를 적극적으로 시행해야 한다.

KEY WORDS: Electronics and Information Industry(IT industry), Foreign Direct Investment(FDI), Spillover Effect, Multi-Nation Companies(MNCs), Research & Development(R&D)

Chapter 1. Introduction

1.1 The background and purpose

Information Technology (IT) is one of the most rapidly evolving, widely used, and pervasive high technologies in the world today. The level of a country's IT is a prominent indication of its capacity for innovation. China's IT industry has used joint venture, experienced cooperative operation and actively taken advantage of foreign capital. Therefore, foreign-funded enterprises has undergone rapid development since 1980. Having Begun in 2001, the foreign companies has enhanced the scale of direct investment and started to set up enterprise in China, combined with China's cheap labor and intelligence resources. They highlight the tendency of foreign direct investment(FDI). Currently, the FDI in China' s IT industry is mainly concentrated in the pearl river delta, Yangtze river delta and the around-Bohai Sea. The industry is forming the industrial cluster relevant to communication equipment, electronic components and electronic components industry. At the same time, the source of FDI in IT industry comes mainly from Hong Kong, Taiwan, Republic of Korea, United States and other 10 countries and regions, which is given priority to with Asian countries or regions.

Since the 1990s, FDI has become the driving force which accelerates economic globalization. It not only provides the motivation of using foreign markets and technology, but also plays the role of the main channel through which developing countries external resource. As a large amount of investments in the world economy keeps steady growth, a amount of the

advanced countries such as the European and American countries have a big lead over others. Meanwhile developing countries and regions gradually stand out as the new object of FDI. Although at present the world's major investment is still flowing to the developed economies like Europe and the United States, more and more investment has begun to go toward developing countries to utilize the emerging markets and resources. Still having experienced the rapid economic growth among the emerging countries, China has become the main state pertinent to FDI, especially in the field of high and new technology. That contributes to attracting more FDI abroad. Since the reform and open policy in 1978, China's absorption of FDI scale has increased and the economic benefit has been promoted. After accession to the WTO in 2011, FDI has been more emphasized as the major element to sustain the Chinese economic growth.

Since 1999, China has implemented the related policy with a view to "rejuvenating trade through science and technology", and has successively come up with the policies conducive to the development of IT industry and succeeded in attracting a great deal of FDI. Under such a circumstance about FDI, the relatively sufficient funds has been provided to support and develop the IT industry and improve the international competitiveness of China's IT industry. As investment environment is increasingly open, FDI inflows are getting more convenient. Open policy and high-speed economic growth seems to form the conditions promoting FDI. Otherwise, FDI inflows, has not only solved the problem of the shortage of funds in the IT industry, but also has broken through the technical bottleneck in this sector and it has a positive impact on improving the international competitiveness of China's IT industry. As the main driving force of China's economy, how to reasonably use and absorb FDI to enhance the international competitiveness in IT industry will be the important breakthrough for the sustainable development of economy in China.

Therefore, this paper, based on FDI, has conducted the study on the mechanism of FDI and the relevant policies' effect on China's IT industry; analyzed the underlying reasons by confining it to the prospective development of tertiary industry; and discussed the direction of new development as well as new target of the IT industry in China; last but not least, put forward some suggestions accordingly at the end of this paper.

Chapter 2. Current situation of IT industry in China

2.1 The development of IT industry

2.1.1 Expansion of IT industry

China's IT industry is large and complex, covering a wide range of product, companies, and subsectors. The country is considered the manufacturing hub of the world's most electronics. Globally, China has the most internet users. Today it has above 500 million users, rising from a mere 22 million in 2000. There are also a billion users of mobile phones, and users of social network and smart phones continue to rise exponentially.

In terms of spending, China's IT market is the fourth-largest market around the globe, after the US, Japan, and Germany. According Business Monitor International, the country has invested a total of 104.5 billion for the industry. Currently, it ranks as second largest software-outsourcing destination next to India. The IT industry of China is expected to grow by 15 per cent annually over the next five years. The four main areas of the industry are: telecom, hardware, software, and IT services. The telecom subsector is a "restricted" industry. Foreign participation is only allowed through Joint Ventures with dominant Chinese players—often large SOEs or private companies that have strong ties with the government. Being a "mature" market, the hardware market is "not restricted." The hardware market has small margins and constant pressure on prices and profits.

IT Industrial Enterprises are over the designated size amount to a total of 6.08 million companies which consist of 1.99 million manufacturing enterprises

and 4.09 million software and information service industry enterprises. As Fig. 1 indicates, as of 2015, the gross sales was composed of the sales in manufacturing industries and that in software industries reached 15.4 million Yuan. Its growth rate shows 10.4% increase. Further into details, manufacturing enterprises amount to 11.1 million Yuan in revenue for main business, showing 7.6 % increase, while software and information service industry constitutes 4.3 million Yuan in revenue, showing 16.6% increase. It is recognized that growth rate of software industry is getting higher than that of manufacturing industry sector in IT industry.

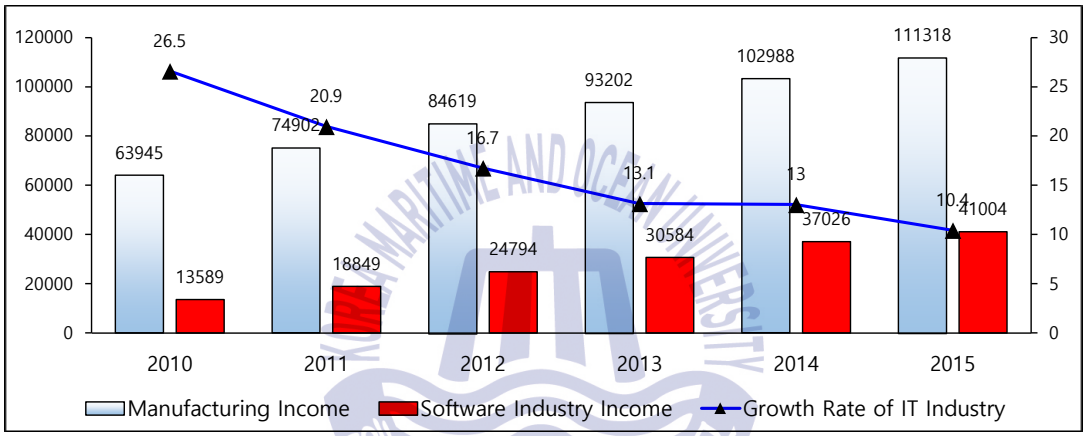

Fig. 1 Growth rate of IT industry in China (2010-2015)

source: Ministry of Industry and Information Technology of the People's Republic of China 2016 .http://www.miit.gov.cn

As Fig. 2 indicates, in the total value added of the electronic information manufacturing industry above designated size, their growth rate is 10.5%. It is 4.4% higher than the average growth rate of the whole industry 6.1%. The growth rage of IT industry in China ranks fifth among 41 industries. Total revenue and profit rise by 7.6% and 7.2% respectively and its proportion in the overall industry respectively have reached 10.1% and 8.8% , over the same period.

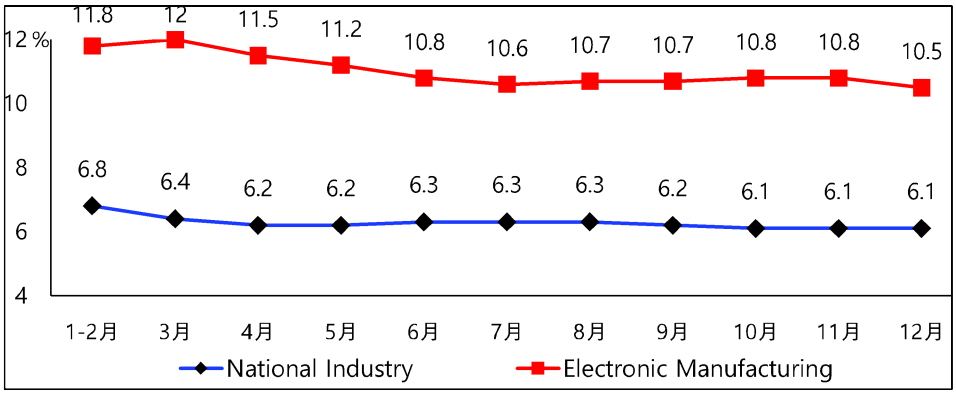

Fig. 2 Comparative trend of the value added accumulated growth rate between the IT industry and the national industry (2015)

source: *China's ministry of industry* 2016.http://www.miit.gov.cn

2.1.2 Increasingly strong international status

In 2013, China's IT industry sales revenue amount to 12.4 trillion yuan. That means, in terms of us dollars, more than 50% in the total global IT spending accounts for the same period. When it comes to hardware manufacturing, Chinese products such as mobile phones, computers and TV production was sold as much as 1.46 billion units, 340 million units and 130 million units respectively, holding more than half of the proportion of global shipments. In regard to the development of software products, the sales revenue in software business has grown by 24.6% annually, which is significantly higher than 5.7% in the global average. This accounts for noticeable increment in the global market share.

2.2 Scales of investment in IT industry

At the beginning of utilization of foreign capital in China's IT industry in 1983, the contract amount of FDI was only 21.78 million dollars. The accumulated contract amount of FDI has reached 26.588 billion dollars, within 25 years. In terms of absolute scale of FDI in the IT industry in China, its

amount has increased by more than 26 billon dollars and up more than 1000 times. Referring to Table 1 and Fig. 3, during a decade, from 2000 to 2010, the total accumulative number of FDI projects in the IT industry in China reached 23,587 which held 6.4% in the total global foreign investment project. Besides the accumulative amount of FDI in the Chinese IT industry reached 80.85 billion dollars, which occupied 10.9% in the total amount of FDI in the world economy.

To look into how much of FDI is actually done, we need to deal with annual date. For example, in 2010, even though the contract amount of FDI in the IT industry reached 30.3 billion dollars, only 8.43 billion dollars (about 27%) was implemented. This means that foreign enterprises are much interested in investments on Chinese IT industry but there are some barriers to block implementing FDI. Compared with FDI in manufacturing industry, the proportion of IT industry amount to only 16.9%. Based on these facts, it is recognized that most of FDI has concentrated on the manufacturing sector for many years.

As the Chinese economy is getting more globalized, the FDI environment is improving, which encourages FDI to prompt utilizing foreign investment in IT industry, to get bigger in investment scale and foreign companies in IT industry to develop rapidly in the wider Chinese market.

Table 1 Current situation of FDI (2001-2010)

(units: one hundred million dollar)

	The total amount of FDI		Amount of manufacturing industry		Electronic information industry		
Year	Number of Projects	contract amount of FDI	Number of Projects	contract amount of FDI	nominal contract amount	contract amount of FDI	percent in manufacturing industry
2001	19,106	488.5	1,993	309.1	106.5	70.9	22.9
2002	24,930	592.7	2,976	368.0	145.6	81.4	22.1
2003	29,307	807.5	2,957	374.7	150.5	63.5	16.9
2004	30,386	1,097.4	3,112	430.2	200.1	70.6	16.4
2005	28,928	1,273.6	2,878	434.5	210.2	77.1	17.7
2006	30,521	1,421.6	3,017	445.2	235.5	85.3	19.1
2007	31,957	1,581.3	3,121	450.2	254.1	91.5	20.3
2008	33,258	1,651.2	3,324	460.9	265.9	95.6	20.8
2009	23,435	1,160.1	9,767	468.0	258.1	72.0	15.9
2010	27,406	1,117.2	11,047	496.0	303.0	84.3	16.9

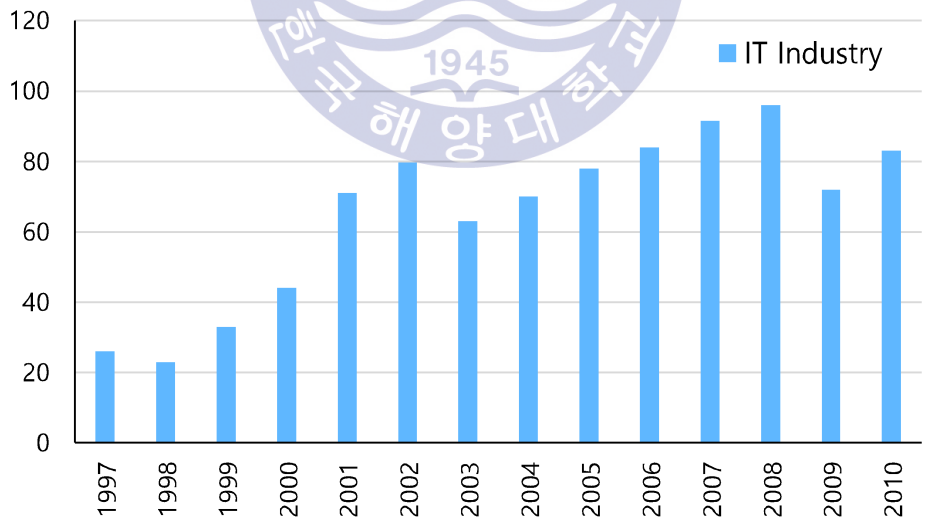

Fig. 3 Current situation of FDI in China (1997-2010)

source: *China's foreign economic statistical yearbook 1997-2010*

Currently, some world top 500 electronic-electrical companies come to invest in China, such as IBM, Intel, HP, AMD, MOTO, APPLE, Microsoft, Lucent, Panasonic, SONY, Sharp, Toshiba, Hitachi, Fujitsu, Mitsubishi, JVC, TDK, Sanyo, Samsung, LG, Siemens Alcatel, Ericsson, Nokia, Philips, Nortel networks, Westinghouse and other companies from Southeast Asia, Hong Kong, Taiwan.

Looking into Fig. 3 the utilization of foreign capital of IT industry in China shows a growing trend since 1997, and obvious dropped in 2003, but since 2003 China's IT industry utilization of FDI keep a steady speed growth trend until the international financial crisis broke out at 2008. And then the actual utilization of FDI in the IT industry in China has obviously declined.

Chapter 3. IT industry and FDI in China

3.1 Situation of FDI

3.1.1 The Characteristics of FDI in IT Industry

1. Regional concentration

The Reform and Open Policy(1978) has provided 'a great turning point' in Chinese economy and society. At the early stage of the Policy, only a few cities located in southern coastal area were permitted to trade with and get FDI from other countries. After succeeding in experiment of open-door policy in special economic zones, Chinese government has extended these zones more to East coastal area, provinces near to East coast.[1)]

Accordingly, the investment environments in a variety of regions in China are quite different. The spatial distribution also is not balanced in the Chinese IT industry absorbing FDI, based on the difference in all aspects of the policy, market size, labor quality, infrastructure, the development of related industries and the construction of soft environment. The inflow of FDI in Chinese IT industry is mainly focused on the regions of Yangtze River Delta , Pearl River Delta, Xiamen in Fujian coastal area, central Bohai Bay and other eastern coastal areas. The areas where FDI was intensively done are generating obvious 'agglomeration effect' . For example, the FDI scale in the Pearl River Delta is not only huge, the industrial structure formed by FDI also ranges from simple processing and compensation trade, low labor intensive processing products to high value-added products. Pearl River Delta has

1) It is called 'point-line-plane open-door policy'

become the production base of consumer electronics. Shenzhen in the Delta has become Chinese largest export-oriented IT industrial city. Dongguan has Pearl River Delta has become the production base of consumer electronics. Shenzhen in the Delta has become Chinese largest export-oriented IT industrial city. Dongguan has become a world famous area which has been producing computer and peripheral products. And the area also playes a major role as the processing base where 95% of parts needed to process and manufacture computer can fully be supplied.

As Fig. 4 indicates, FAI in the IT industry concentrates on both areas in Jiansu Province and Guandong Province. By the end of 2010, FDI worth more than 30 billion dollar was carried out in electronic information enterprises located in Jiangsu Province. There are 23 enterprises whose sales revenue exceeded 10 billion. There are 9 enterprises in the 2010 when there are hundred enterprises in the whole national IT industry. At present, Jiangsu Province has already become a national information industrial base with 4 national IT industrial park. And there are also information-intensive industries at home and from abroad whose proposition holds over 80% in the total industry. [2)]IT industry in Jiangsu province in 2010, in terms of cumulative fixed asset investment, ranks first in the country, compared with other provinces. It has become an important manufacturing base for China and even the world's IT industry.

Shanghai has become 'a colony' of FDI in China in the field of electronic information enterprises. Shanghai and Suzhou are considered the center of the Yangtze River Delta which has been forming the production base in the integrated circuit industry, notebook computers, displayers, digital cameras, PDA and electronic components. Beijing and Tianjin city as the central region

2) The ministry of industry and information technology operation monitoring and coordination bureau. <China's electronic information industry statistics yearbook>.Electronic industry press

of Bohai Bay, has also emerged as the important cities for FDI. A lot of FDI relevant to IT industry has flowed into this areas to take full advantages of properties these cities have as capital zone of China, because Beijing Metropolitan area is building up a large market through abundant information as the center of politics in China and the existence of big population. The strategic position of Beijing market, in the eyes of the Multi-National Corporation(MNC), has become more and more prominent. In Beijing there are now a lot of MNCs significant in the world such as EPSON, Canon, OMRON, Panasonic, SONY, SIEMENS, Ericsson, Samsung, LG and other large MNCs in the establishment of the Asia Pacific headquarters. In 2011, the world's top 500 MNCs set up corporate headquarters in Beijing and the number of MNCs in Beijing is larger than that in New York and London. And the number of world-class MNCs in Beijing has exceeded that of Tokyo. At present, Beijing has 21 more of the world-class corporate headquarters than New York and London.

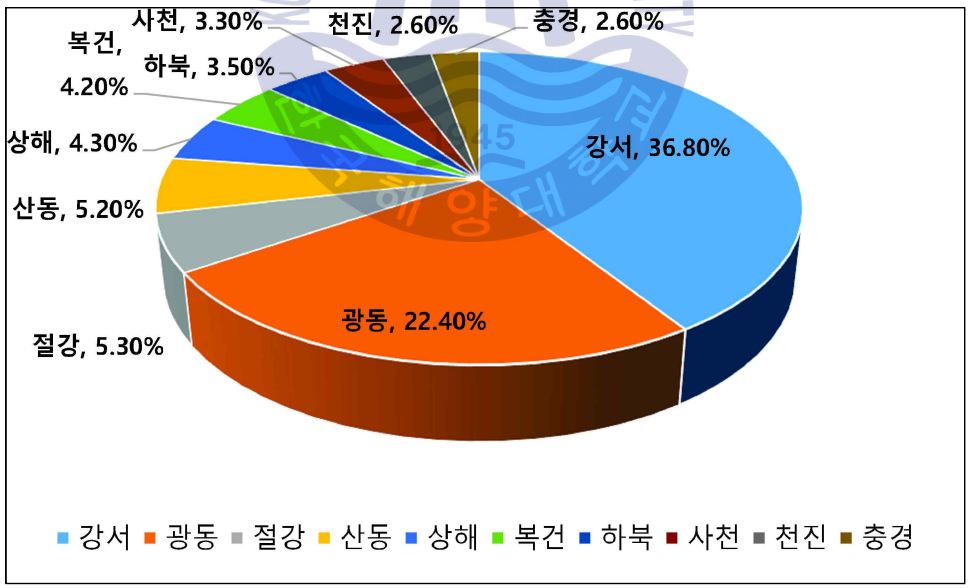

Fig. 4 Regional distribution of attracting FDI in IT industry(2010)

source: *China's electronic information industry statistics yearbook 2010*

From Fig. 4, the distribution of FDI in China's IT industry can be seen. The top 10 regions are as follows: Jiangsu, Guangdong, Zhejiang, Shandong, Shanghai, Fujian, Hebei, Shichuan, Tianjin and Chongqing. They are intensively concentrated in the eastern coastal areas. Jiangsu Province which alone accounted for 36.8% of the entire industry's use of FDI, was ranked first. Guangdong Province Ranked second accounted for 22.4%. And other cities or areas show similarly less than 5%. When the proportions of only two Jiangsu and Guangdong are added, reaching as high as 59.2%. We can figure out that two regions, Jiangsu and Guangdong Province, plays pivotal roles in Chinese IT industry.

2. Industrial concentration

FDI is mainly concentrated on the electronic and communication equipment manufacturing industry, integrated circuit manufacturing industry, mobile telephone manufacturing industry and computer manufacturing industry and other related industry. Because these industries are the core industry in the IT industry, they belong to not only capital intensive industry as usual. And they now gain huge profits, which makes them the world's strategic industries. Regardless of the total amount of investment funds or projects, the inflow of FDI in China's electronic information manufacturing industry is higher than that of FDI in the software industry.

According to China reports, in terms of FDI, the number of items in electronics and communication manufacturing industry reached 1,304 in 2010, accounting for 8% of the total amount of FDI. FDI in value actually used amounted to 84. 3 billion during a decade between 2000 to 2010. In Chinese communications equipment, computers and other electronic equipment manufacturing industry, the number of items in cumulative FDI amounted to 23,587, accounting for 6.4% of the total global foreign projects. The cumulative use of FDI in value amounted to 808. 5 billion dollars, accounting for 10.9% of the total amount of FDI.[3)]

3. Multiple sources of investment

Fig. 5 shows which countries provide FDI to China. It is obvious that almost half of FDI inflow to China comes from Hongkong. We can find that most of the original sources' countries of FDI belong to Asian countries-Hongkong, South Korea, Japan, Singapore- except the United States. In 2010, China's IT industry, the actual use of foreign investment ranked in the top five are from China Hong Kong, the British Virgin Islands, South Korea, Samoa and the Cayman Islands. The China Hongkong investment accounted for 48%, the British Virgin Islands investment accounted for 13%, South Korea's investment accounted for 10%. Five foreign sources' countries accounted for 76.1% of the actual use of foreign capital. The top ten foreign investment funds in China's IT industry manufacturing industry accounted for about 90% of the actual utilization of FDI.

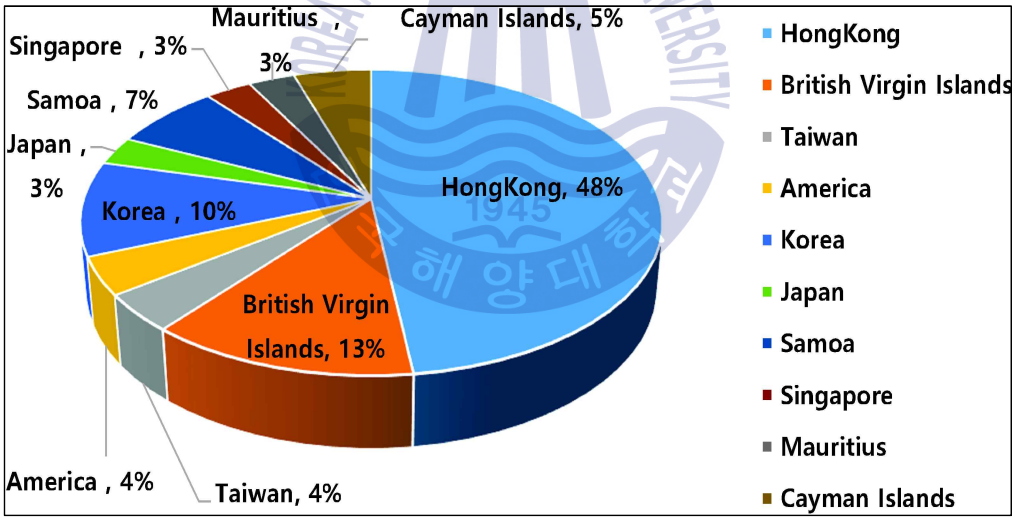

Fig. 5 Multiple sources of FDI

source: *China's electronic information industry statistics yearbook 2000-2010*

3) The national bureau of statistics of trade company .*China's foreign economic statistical year book.* China statistics press. http://www.stats.gov.cn/tjsj/ndsj/

However, what we pay attention to is about Samoa, Mauritius and Cayman Islands. These countries are known as a famous tax haven in the world economy. It means that FDI from them is not really theirs. There is a high possibility some Chinese enterprises take an advantage of its own fund as an FDI to avoid domestic tax and enjoy the benefits provided by government. Considering these facts, over a quarter amount of the whole FDI inflow to China comes from Chinese companies

From the type of registration, In 2010 more than the size of the IT industry manufacturing Companies Limited by Shares with Foreign Investment number is 4696, Hong Kong, Macao and Taiwan investment enterprises reached 3632.[4] From the proportion of assets scale, Foreign and Hong Kong and Taiwan investment enterprises accounted for the largest scale, reached 68.15%, far higher than other ownership enterprises. In Chinese electronic and communication equipment manufacturing industry in Hong Kong, Macao, Taiwan and foreign-invested enterprises obviously dominated.

The main economic indicators of the main business income, total industrial output value, export delivery value of IT industry can be seen that the proportion of foreign enterprises is the highest, Which in 2010 the proportion of total industrial output value reached 50% of the industry, the proportion of industrial sales output value of 50.2%, the proportion of export delivery value of more than 70%, the main business income accounted for more than 67%. [5] From the various economic indicators of Chinese IT industry, the proportion of foreign-funded enterprises in various economic indicators are more than 50%, foreign direct investment has an absolute advantage in the whole industry assets.[6]

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4) The ministry of industry and information technology bureau. *China's electronic information industry statistics year book* .pp126 Electronic industry press

5) The ministry of industry and information technology bureau. *China's electronic information industry statistics year book*. pp231 Electronic industry press

6) The ministry of industry and information technology bureau. *China's electronic*

3.1.2 The trends of FDI

After China's entry into WTO in 2001, the growth rate of FDI increased significantly. There are two elements we take a look at. One thing is that the improved economic and social openness in China made the market more attractive. The other thing is that accession to the WTO made tariffs and other trade barriers faced by Chinese manufacturing industry eliminated and made China enjoy cost advantage. The rapid influx of foreign capital led to the increase of GDP and accelerated the integration between domestic and foreign markets. Thus it, to a large extent, played a role of FDI entering the Chinese market. Such a market attractiveness has contributed to promotion of FDI. So especially foreign enterprises pay more attention to the Chinese market, intensifying competition which has stimulated foreign capital enterprises to adjust themselves to the investment strategy in China. Under this kind of background, the investment characteristic of the foreign capital enterprise has been changed in recent years.

1. Further expansion and integration of investment

In recent years, China's rapid development led most of the foreign companies to enter China to invest further increasingly. The foreign enterprises which have invested in China will implement the integration between them, so as to strengthen the control of the headquarters in Chinese Market, And those which have not yet invested in China will accelerate the pace of investment in China. According to a recent survey by the Ministry of Commerce, in the next two or three years, based on the investigation of foreign-funded enterprises, 16% of them will try to enter the Chinese, 35% of them will go into the stage of integration, 16% of them will expand investment, 26% of them go into investment management stages and only 1% of them will exit. In the electronic information industry, it is obvious that

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information industry statistics yearbook pp275 .Electronic industry press

foreign enterprises have tendency to extend FDI to China. For example, Intel has decided to produce a multi core processor (Core Multi Prozessoren) in China for the first time. According to the German authority estimates, the project investment will reach $2 billion, and that will become Intel's largest investment project in China so far. Up to now, Intel's total investment in China has reached 1 billion US dollars. In 2005 Intel made a new investment in building a semiconductor packaging plant in Chengdu. Foxconn Technology Group will also invest $1 billion on the establishment of industrial park in Wuhan Donghu New Technology Development Zone, which will be set up for the production of digital cameras, monitors and other products. Siemens Ltd China in Beijing announced that Siemens had completed one year ahead of China's investment of 10 billion yuan plan, and would start from 2007 to 2010, continued to invest 10 billion yuan on China market.

2. Control of the industrial chain and value chain

Worldwide aggravation of competition makes the foreign enterprises pay more attention to the shaping and strengthening of the core competence. How to peel off unrelated business and marginal business and then change into outsourcing to reinforce core business has become the main direction of the development of foreign investment enterprises. In the electronic information industry, foreign companies will increasingly invest on material upstream of the industry chain chips and other items. Therefore, in 2005, we can see more foreign companies set up R&D centers in China, such as Intel, AMD, Agilent and other upstream chips and materials manufacturers which increased investment, while Sharp, Samsung, LG, and other diversified enterprises increased the investment on the LCD panel. Other upstream companies increased the investment in the LCD panel and other upstream.

3. Acceleration of the strategic layout of space in China

In order to make full use of the various resources in China, and to obtain

competitive advantage in the Chinese markets, foreign enterprises speed up the layout of the space strategy in China. For example, ASUS announced in early 2007 that it would make the amount of investment increase $72 million to the Shanghai Chang Shuo, Suzhou Bai Shuo, Lian Shuo, in order to respond to operational needs, and to increase operating efficiency. Also with the rent of land and wage of the eastern coastal areas in China rising, the competition in production factor markets is increasing fiercely. Many foreign enterprises has planed to make additional investment to the central city located in the central and western China. Micron Semiconductor Corporation, USA's firm, invested $250 million to set up packaging and testing plant in Xi'an, central city located in central China. Alcatel invested in Chengdu to set up a new R & D center. With the strategic layout space in China changing, the investments to China done by many foreign enterprises have been transferred to farming industries intensively. How to more fully tap the advantages of Chinese market is becoming an important element of competition.

4. M&A as an important means of investment

According to the data released by the Ministry of Commerce in 2006, the number of the newly established foreign-invested enterprises in the non-financial sector(excluding banking, insurance, securities) amounted to 41,473. Actual use of foreign investment in nominal value reached $63.0 billion, which meant an increase of 4.47%. This shows that the additional investment become the main reason for the growth of FDI. On the other hand it also reflects a new characteristics of foreign investment which has been forming in China. There are quite a few foreign enterprises which has implemented M&A investment since the past one or two years. For example, AsiaInfo merged Lenovo IT service and USA Amazon e-commerce service provider purchased Network of Excellence and other acquisitions. CimisLogic announced the acquisition of the company Caretta which produced

semiconductor in early 2007, a company located in Shanghai without a wafer factory owned by Integrated Circuit Design Company. Acquisition, on the one hand, is a good means to accelerate the expansion speed of foreign enterprises in China, and to reduce the risk of expansion. It also makes a large number of domestic enterprises strengthen their competitive ability to avoid being controlled by foreign companies, losing independent brand and innovation ability gradually and making the domestic market occupied by foreign enterprises.

5. Venture capital investment

Due to the slow development of venture capital investment in China, it seriously restricts the development of high-tech venture enterprises, But recently this situation has improved, because of the massive entry of foreign venture capital. At present, some of small and medium-sized enterprises in Chinese high-technology industry. They are paying more and more attention to the international venture capital fund. According to statistics from 2003 to 2004, 39 companies located in Zhongguancun science and Technology Park have got 41 times overseas investment from financial institutions which loaned $990 million. For example, Excellence Network accepted $75 million investment from Amazon and Beijing Ling Xun Interactive Technology got Tom company invested $66 million 400 thousand and so on. Foreign venture capital has also contributed to forming capital in China's electronic information industry and then indirect investment has become an important means.

6. The equity of foreign capital in the joint venture project

In 2003, the total number of newly established foreigner-owned enterprises in China amounted to 26,943 and occupied 65.59% of the total number of foreigner-funded enterprises; actual use of foreign capital amounts to 333.84 billion, accounting for 62.39% of the total number in 2004. According to foreign investment statistics, the number of sole proprietorship enterprises

was 27746, about 70% of the total number. The actual use of foreign capital amounted to $389 billion, accounting for about 70% of the total number. Japanese Toshiba Co invested $920,000 on 10% shares of Jinqiao Shanghai to obtain as a joint venture partner and set up Toshiba computer Shanghai Co. It changed into a Japanese owned company. Japanese Panasonic and America Whirlpool have also taken the similar steps and become sole proprietorship enterprises. The original Beijing International Exchange System Co., Ltd. (BISC) also announced that they changed the existing name into Beijing SIEMENS communications network Co., Ltd. (sCNB). All these show that foreign sole ownerships are getting more and more, noticeably reflected in the high-tech industry.

3.1.3 The relation between FDI and IT industry

1. FDI promotion and the size of the IT industry

FDI have obviously played a great role in promoting economic growth in the process of China's industrialization. FDI has, to a considerable extent, contributes to making up for the lack of investment funds and enhancing the level of investment in the electronic information industry. Since 1996, the use of foreign investment in the electronic information industry has increased year by year. The total amount of FDI signed in 1996 came to $ 3.756 billion. By 1999 the amount of FDI in the entire information industry jumped to $7.235 billion and doubled in just 3 years. The contribution of foreign investment enterprises to the added value is the biggest, as Table 2 indicates. During a decade from 1993 to 2003, the overall growth rate of foreign-funded enterprises amounted to more than 50.7%. Compared with growth of industrial added value of electronic part by state-owned economy and the collective economy, the growth rate is noticeably high.

Table 2 Contribution of FDI to the value added of IT industry

units: one hundred million

Economy type	Added value in 1993	Added value in 2003	growth of 2003 based on 1993	percent of overall growth
Total IT industry	290	4245	13.6	100
state-owned economy	141	506	2.6	9.2
collective economy	49	288	4.9	6
Joint stock system economy	31	1151	36.1	28.3
Total foreign capital enterprise	58	2066	34.6	50.7
Other economic	11	234	20.3	5.8

source: *China's electronics industry yearbook 2004*

2. FDI control and the development of the IT industry

While FDI enterprises have stimulated the growth of Chinese electronic information industry, they have at the same time occupy the main status of the industry. FDI in the 1990's has brought significant changes to the structure of the IT industry. In 1980, the state-owned enterprises and collective ones accounted for each 3/4 and 1/4 in the total output value of China's IT industry. Then there were no other types of enterprises. Since the 1990's, with the deepening of Chinese openness to the outside world, the output of foreign funded enterprises in Chinese electronic industry was significantly greater than that of state-owned enterprises, as Fig. 6 indicates. In the structure of electronic information industry, foreign invested enterprises has occupied the leading position. Too much control of the industry of foreign enterprises will have an impact on the industry security. Foreign control of the industry at this stage is mainly manifested.

a. Foreign capital and control of the market

By using foreign capital, companies may enlarge the market share in the domestic industry which measures the market control power of the foreign

capital enterprises. The electronic & communication equipment manufacturing industry, due to the relatively low labor costs in China, rich intellectual resources, is suitable for production of large-scale electronic information products. That makes many foreign companies keep sole proprietorship or joint venture. They has taken a variety of ways to go into China for OEM base. The recent statistics[7] showed that industry market of foreign investment and the enterprises invested by Hong Kong, Macao and Taiwan occupied over 50% market share in the total market. They have a higher rate of electronic and communication equipment manufacturing companies than the state-owned companies have. It is not too much to say that foreign enterprises have controled the market of IT industry. This shows that Chinese electronic and communication equipment manufacturing industry may be in a state of crisis, based on the market control rate index. This industry security is affected by the market power the foreign enterprises wield. In this point, this industry is facing the challenge in terms of security.

b. Technology control by foreign capital

Foreign enterprises monopolize and control the core technology relevant to Chinese electronics information industry, according to China industry development report (2002). The IT related companies from the United States occupied 75% market share for China's information technology products. U.S. VIET video company did 70% market share in China Conference TV industry. SIEMENS controled 20% in Chinese telephone switching technology, 30% in communication technology. 35% in the fiber optic cable and 20% in the digital communication equipment. Although the market share of domestic brand mobile phone rose from 5% in 2002 to 39.4% in 2008. But most of the domestic mobile phone enterprises still remain in the stage of the assembly and parts. There are no independent research and development when it comes to hightech products, especially kept not abreast of mobile application

7) *China's foreign ecomomic statistical yearbook* 2010.

software and RF module design and other core technologies. Supporting capacity of the mobile communication device components and parts is relatively low. Therefore, Core chips and liquid crystal display (LCD), mainly rely on imports.

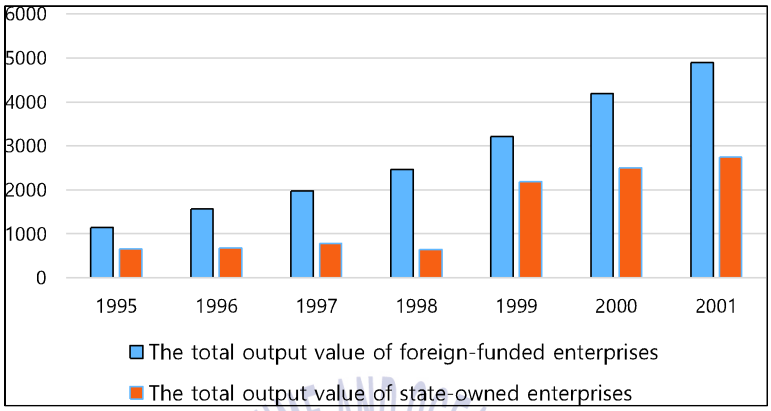

Fig. 6 Comparison of the total output value of foreign-funded enterprises and state-owned enterprises

source: *China's high technology industry statistics yearbook 1995-2001*

Chapter 4. Problems of investment in IT industry

4.1 Overinvestment

Huge consumer market in China, cheap labor market, preferential policies to attract FDI get coupled with the electronic information industry capital. This industry requires relatively dense technology and are very lucrative. The developed countries started to invest in China IT industry. Foreign investment enterprises behaviored in a quite similar way. FDI investment is mainly concentrated in the broad market which produces high profits, such as home appliances, computers, mobile communications and so on. That results in overinvestment in IT industry and uneven distribution of the investment between industries, which is repeated more seriously.

Overheated investment in many industries of IT leads to excess production capacity, inventory build-up, more intense market competition. At the same time, waste of manpower and resources begins to appear. Some of the IT industry's investment in the sub-sector is getting less. For example, the electronic components industry and software industry requires knowledge-intensive and the art-of-state technology. However China lacks these core technology research that leads to the adjustment and optimization of China's IT industry structure, which will restrict the sustainable development of China's IT industry.

4.2 Blockade on New Technology

Multi-National Corporations, in order to maintain its own competitive

advantage, often take various measures to limit the spillover of technology.

First, the Multi-National Corporations take the establishment of a wholly owned subsidiary in China to limit the spillover of technology. Since 2001, with China's accession to the WTO, Chinese government has taken measures to allow foreign investor to possess a wolly owned subsidiary in China, which strengthen and enhance the degree of familiarity with foreign companies in China. Then foreign investment enterprises has begun to transfer their type of investment to wholly owned subsidiary. Changes has occurred in mode of proprietorship. Before the sole proprietorship was allowed, Chinese government had encouraged foreign investor to do joint venture with Chinese companies. The purpose of this policies was to help Chinese companies absorb the new technology and through spillover effect and diffusion effect to enhance the imitation and learning ability, or through strategic alliances to share the fruits of technological innovation, leading to technology introduction and data reduction. This led to the formation of the industrial technology progress mechanism, the key technology from overseas and the internal circulation of Multi-National Corporation in the situation.

In particular, the trend of foreign enterprises "wholly owned" will aggravate the internal cycle. In this case, the ability of independent innovation usually comes from the "spillover effect". Rather than the introduction of technology and other forms of direct access to get technology, the size of the "spillover effect" is mainly determined by the mobility of the elements, such as R & D personnel, technical information and other elements of the dynamics. Chinese enterprises must improve "learning by doing" capability for the technical progress, to form the OEM and ODM transformation of the autonomous learning mechanism. This has brought new challenges to the enterprise which is used to the technology introduction. Take Multi-National Corporation research and development center as an example, although Multi-National Corporation in recent years accelerated the

establishment of R & D centers in China, the number is still small and most of them are wholly foreign owned enterprises. Since the late 1990s, the establishment of R & D institutions in China has become an important trend of Multi-National Corporation's investment in China. After 1997, more than 90% of the Multi-National Corporations considered setting up regional headquarters and R & D center in China as soon as possible. After China joined WTO in December 2001, especially in the last two years, Multi-National Corporations accelerated the establishment of R&D center in China, with the latest technology and the fastest speed to dominate the Chinese market. For example, Microsoft Corp set up 5 R & D centers in China, mainly in Beijing, Shanghai and other cities. The China Technology Center set up by General Electric in Shanghai is the third global R & D center besides the United States and India. Multi-National Corporations in China which set up R & D center is the vast majority of Multi-National Corporation-owned institutions, and only a small number of R & D center is a joint venture with China, such as Lenovo and Intel joint venture which set up R & D center in 2003. And at present, most of the foreign enterprises' R & D projects in China are in the form of a wholly owned enterprises, such as a $100 million investment by Lucent Baer laboratory, $6 million investment by Samsung Communications Technology Research Institute, a $166 million by Unilever Research Center in Shanghai, $80 million investment by China Microsoft Research, IBM China Research Center and others are to take the form of wholly-owned enterprises.

Secondly, due to the implementation of FDI technology control strategy, Multi-National Corporation's control of advanced technology may make the host country dependent on the Multi-National Corporation's technology. Multi-National Corporation's control of technology will weaken the host country's technological development and innovation capacity, resulting in the host country "technology-dependent" and produce dependent relation".

Multi-National Corporations in recent years, the most representative of the strategic means is “technology lock-in strategy”. Referring to a certain product (or service) technology monopoly advantage of Multi-National Corporations is as follows: from the basic theory, strategic planning, research and development, product design, process design, manufacturing process, management technology, quality control, logistics distribution and marketing network, aftersale service, and so on. But Chinese enterprises is very difficult to break the barrier, such as the whole process of the design because MNCs try to tightly control its core technology to protect it. Thant will finally strengthen the dependence of the host country on Multi-National Corporation Technology.

From the Multi-National Corporation’s practice to invest in China in 20 years, they have established a complete set of technical control strategies. And its technology strategy is constantly adjusting and developing. First, the core technology is multinational firmly in their own hands, because the key technology is the survival and development of enterprises. Secondly, the Multi-National Corporations in China are to use equity control and key management personnel control and other means to implement technical control. In addition, the parent company of the Multi-National Corporations which not only controls the development and transfer of technology, but also with the joint venture, is still trying to weaken the original Chinese Technology Development Department, and takes it from “research and development” to “technical support”.

That is to solve the technical problems on site, which is the most outstanding performance in the electronic information industry which is very rapid in technology change. Due to the blockade of key technology by foreign investors, integrated circuit technology development in China is retarded. IT Industry development in China heavily depends on foreign investments. Making the downstream industry for a series of hightech products is difficult to break

through, restricting the development of the domestic IT industry.

4.3 The environment for investment

The Chinese government's policy designed to affect foreign companies behavior is also one of an important factors which have an effect on the level of China's technology diffusion. Although the Chinese government has formulated the income tax, the increment duty and the business tax and so on to levy on the FDI, at the same time, encouraging FDI to set up R & D Center. However, the strategic adjustment of foreign investment enterprises, especially the technical strategy did not help China develop relevant preferential policies in a timely manner. Therefore foreign investment enterprises' R & D institutions can not enjoy the national treatment, cannot fully use China's scientific and technological resources and access to China's science and technology market, cannot participate in the national major issues and participate in the national R & D achievements appraisal, etc.

In addition, when the research and development center of foreign invested enterprises engaged in R& D activities, as a result, they should pass the test to import a large number of intermediate test product which are regarded as high-end consumer goods by customs, the high tariffs and import value-added tax on the R & D center which caused a lot of cost burden. All these have restricted the technical level of the establishment and development of foreign investment enterprises in China R & D institutions.

Multi-National Corporations concern about the protection of intellectual property rights, and also restrict the transfer of technology to China, especially the transfer and diffusion of advanced technology. Mature technology and adaptive technology are the mainstream technology of foreign investment enterprises. That kinds of technology itself is easy to be spreaded out and to imitate. In recent years, the domestic enterprises in the process of cooperation with foreign enterprises, the ability to digest, absorb and

transform itself has been greatly enhanced. Therefore, intellectual property disputes between domestic enterprises and foreign investment enterprises have occurred frequently. Foreign investors in the process of setting up a joint venture are often worried that the Chinese partner will infringe upon their intellectual property rights. Although in recent years, China has made considerable progress in the protection of intellectual property rights, but the level compared to market economy in the developed countries there is still a big gap. The level of intellectual property protection awareness in some of the domestic enterprises is poor. They do not respect other people's intellectual property rights and make arbitrary violation to the intellectual property rights of other enterprises, especially Multi-National Corporations, so that the intellectual property disputes often occur. In addition, the Multi-National Corporations in the process of setting up a joint venture is often also worried that the Chinese partner will infringe upon their intellectual property rights, which leads MNCs to make a strong protection of intellectual property. It made the foreign invested enterprises always very careful when making technology transfer to China. And it also retained part of the transfer of the technology and severely limits the diffusion of technology in China's technology.

4.4 Uneven FDI in IT industry

The introduction of foreign investment in China's IT industry from a view of foreign investor was begun, in order to avoid trade barriers, tariff barriers and non-trade barriers. From a view of Chinese government, it have incentives to attract FDI, taking into account the IT industry technology spillover. Investments in a wholly foreign owned manner, to a large extent, have huge impacts on China's use of advanced technology from developed countries and impede China's electronic information enterprises' learning and imitation to the international advanced technology.

From Industrial investment, most of the foreign-funded enterprises mainly invest in the hardware manufacturing industry with low technology content, in order to prevent technology spillover and keep enterprises' profit and competitiveness. The software and network industries relevant to the chips with a core technology are rarely invested by a foreign capital enterprise. Overall, China is still at the low part of the global industrial chain. Basic IT industry development lags behind and the core product technology innovation is not enough.

From the geographical distribution, FDI is mainly concentrated in the eastern coastal areas and has obvious agglomeration effect. The distribution of investment in the central and western regions is relatively small. To a certain extent, this pattern can improve the efficiency of China's utilization of foreign capital, but it will further widen the gap between eastern central and western regions of China. The industrial scale and technical level gap between east center and west of China will be further enlarged, reducing the complementary advantages of location advantage, further aggravating the level of China's economic development not balanced. Labor costs in eastern coastal areas is persistently increased in recent years. And land tension, serious environmental pollution, labor shortage and other problems as an negative externality emerge. The energy, resources, labor and other advantages in the central and western regions have not been exerted well. That results in waste of resources allocation, which affects the balance of China's economic development.

The entry of foreign capital promotes the spatial agglomeration of electronic information industry. China's IT industry has a characteristic of hightech industries and export-oriented industries similar to other countries' s industries. Mainly distributed in the developed coastal areas, they are quite different from those in the regional economy, in terms of industry scale and technology level gap widening. Failed to fully reflect the complementary

advantages of location, in recent years, labor intensive industries in the eastern region are facing tremendous pressure to upgrade, land and environmental pollution, labor shortage and other factors which have begun to offset the sustained and rapid development of these areas. The central and western regions with abundant energy, raw materials, labor, and other advantages of the local market failed to fully play out, which limits a favorable dynamic industry growth.

4.5 Serious pollution

With the influx of FDI into China, the developed countries have moved their factories to China. China's environmental resources have been seriously threatened. IT industry is not like people's traditional concept of energy consumption, less pollution. Candle carving, painting, electroplating, smoke, such as injection molding production process design and production process of electronic information products, will make a large number of wastewater, metal containing compounds of harmful gases, environmental pollution and human health hazards of harmful substances. Electronic waste contains many harmful chemicals. Being discarded if not dealt with, but simply burying them, one of the metal elements and chemicals will penetrate into the soil and underground water and cause very serious pollution. And the burning of electronic waste will also produce a lot of harmful gas pollution.

Chapter 5. The improvement policy

5.1 Strengthening the policy guide

The government should strengthen the planning guidance and implement the rapid decisions to cultivate and develop strategic emerging industries, IT industry, issued by the state council. Implementing and supporting the policy on the development of IT industry will produce a great synergy effect by actively docking the national strategic industries. So it is of great significance to continuously do research on and speed up cultivating a new generation of information technology industry. Therefore, the government should guide and stimulate the social capital to develop this important industry by designing the major projects, by developing the key technology research and by nurturing experts. These kinds of polices are able to promote the informatization of national economy. If government constantly optimize the allocation of resources, capital and technology together, cultivate and support the development of electronic leading enterprises and industrial park, then it contributes to speeding up the implementation of the industrialization of the IT industry.

In addition, to do well in the coordination and cooperation in each park and to find their own expertise and advantages are the most important things. That is a good way to avoid the redundant construction. And our goals are to improve the management of the IT industry, to improve the development of IT industry environment, to unceasingly achieve the international advanced level, to accelerate the transformation and upgrading in IT industries, to

encourage and support the new technology and new product promotion application. Those things can be major factors to form an agglomeration effect in IT technology.

Firstly, we should comprehensively establish the Scientific Development Concept and standardize the major industrial policies to carry out the policy for the national strategic development in emerging industries. The government should take up strengthening the independent innovation ability, improving the industrial structure of IT industry in China and upgrading the international competitiveness of electronic information products as the goal. And it also should set up the correct investment consciousness to enhance the quality of the investment and avoid the excessive duplication of investment. It should prohibit the IT industries from investing to China which cause the high pollution. It should make steady efforts to transfer the international electronic information manufacturing and services to China. At the same time, it should pay attention to the efficiency and quality in the process of absorbing foreign technology in our country and taking advantage of it.

Chinese government can use some preferential policies and foster good investment environments. To do that, it should prepare an attractive guidance to derive foreign investment in the high technology industry. By optimizing the structure of foreign investment, it tries to solve the problem of the core technology transfer to IT industry in our country. Then we can promote the industrial structural change in Chinese IT industry.

The China government should actively transfer foreign capital investment to the central and western regions, because its investment environment and infrastructure should be improved. Then we can narrow the economic gap in the Midwest regions by reducing the tax preferential policies. In addition, we should preserve the diversity of foreign investment. The IT industry investment of China is mainly from the United States, the European Union, Japan and so on. Relying on the investment made by only one country is not

conducive to our country industry security and easily influenced by the global economic crisis. So it is very important to preserve the diversity of sources of foreign investment.

5.2 Utilization of MNCs

In theory, the technology diffusion of MNCs can be done by market forces spontaneously, but it takes time to diffuse technology. As the above analysis already indicated, because of some restriction factors and negative effect, there may be problems in absorbing the benefit of the technology diffusion from MNCs. In order to overcome the above limitations and adverse factors, government should take some effective measures to reduce or even avoid the problems in technology introduction and absorption. And it should also make it possible to promote the domestic technology through transfer and diffusion of the MNCs' technology. As long as the suitable conditions and the appropriate national policy are prepared, the FDI in China can be a good way to transfer technology and management skills such as intangible resources to China. Then, it can make contribution to the development of IT industry in China.

5.2.1. Association between local companies and multinational companies

We can obtain the technology spillover effect through electronic information enterprises cooperation with MNCs in China. Because of the small scale, lack of funds, and weak technological forces, it is very difficult to separate a high level of cooperation with large MNCs. And it will be difficult to improve their technological ability. If we are usually in the down-stream of the industry, it is difficult to develop the local enterprises. It will also directly affect the overall level of IT industry in China. So it is necessary for government to encourage Chinese enterprises to establish strategic alliance by the way of industrial consolidation, the cooperation and sharing, with a view to improve the whole technological ability of local companies. And Taiwan and China has shared the successful experience in this respect. Aiming at the condition of

the smaller local IT companies in Taiwan led by the Taiwan industrial technology research institute, the alliance which more than 30 IT industry enterprises took part in has been formed. Through it, Chinese companies could harness the power of the alliance to integrate each enterprise's resources, to expand technological capabilities. They have taken the form of alliance to cooperation with IBM, MOTOROLA, NEC, SONY and Toshiba and so on. Each enterprise which belongs to alliance is able to take advantage of the product generated by technology diffusion effect, to gradually accumulate the capacity of their core business. And it is able to establish their own research and production capacity, to set up their own brands, and eventually to participate in the international market competition.

5.2.2 Active participation of R&D activities

The R&D institutions of MNCs has become one of main forces in the world's research and development domain. The R&D investment done by MNCs in China is an advantage to the global technical progress.

Fig. 7 shows that the trend of investment with the type of joint venture and the number of developers in Chinese IT industry in recent years go upward toward roughly the same direction. During the period between 1996-2010, with China's IT industry investment of foreign-funded enterprises increased, the number of R&D personnel is also increasing and has amounted to 400,000 people by 2010. So the R&D cooperation with joint ventures enterprises promote the number of R&D personnel in China and improve the level of human resources.

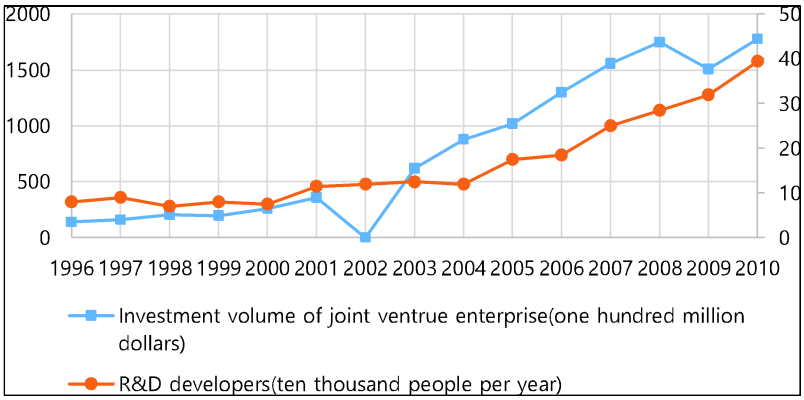

Fig. 7 The trend of joint venture investment and the number of R&D developers.

source: *China's high technology industry statistics yearbook 1996-2010*

Technology is the most important means to assist this industry to grow by leaps and bounds. Technology spillover effect through these research institutes can promote the development of science and technology of China by outsourcing and the cooperation with Chinese scientific research institution and enterprise and the formation of strategic alliances and so on. In order to activate technology transfer, joining the R&D system of MNCs is considered a shortcut for Chinese companies to get the technology spillover. At present, multinational IT enterprises which set up R&D institutions in China have the independent research and development system. They are controling the related technology very strictly to protect it from other competitors. So it is not easy for Chinese enterprises to obtain technology spillover. Now, it is not important to attract more MNCs but to find ways to get more technology spillover by allowing MNCs to set up R&D institutions on the condition that they should cooperate with our country enterprises. This kind of policy will be good for getting the spillover effect from trans-national corporations.

5.3 “Spillover effect” for rational exploitation

5.3.1 Policy environment

Creating a fair competition environment is of a great significance to enhance enterprise's competitiveness. A competitive market environment is another important factor to promote spillover effects. From the perspective of MNCs, if they face the fierce competition, their concentration on research and development will be strengthened. Then R&D team makes a comprehensive efforts to intensively use all kinds of knowledge from all over the departments. During this process, the degree of internal technology transfer will also increase.

Establishing market norms and enhancing the competition of the domestic market can effectively improve the technical level of MNCs and it is advantageous to spread out the spillover effect.[8] Chinese government should prepare the polices helpful to create a fair market environment for the domestic and foreign enterprises and to ensure fair treatment without the discrimination between the domestic companies and multinational enterprises. Otherwise, the MNCs who may gain legal and tax preferential policies certainly will become the biggest constraints of private enterprises in our country. To diminish the effects of “Super national treatment” for the foreign capital enterprise and to enhance the competitive domestic market for domestic and foreign enterprises to create fair competition market environment is very important. Government should leave out all kinds of unreasonable examination, simplify the approval procedures, improve the administrative efficiency of government and establish incentive mechanism to encourage the fair competition. These will contribute to attracting MNCs who

8) YongFeng Wang(2005) “Foreign direct investment spillover effect research were reviewed” ,*International business-Journal of university of international business and economics.*

can bring new technologies and new management method to China. And so they can form a competitive relationship and prompt them to put into more advanced technology in China.

The government should promote many MNCs which have succeeded in FDI and have made differences in forming the competition to further improve the domestic capital market. Because it can not only provide the financial support for the experts who used to work in MNCs and have kept the business management skills, but also prepare a good financing channel for domestic enterprises to be able to hire them. Based on these encouragement program, the competitiveness of the domestic IT enterprises will be able to be enhanced. And Chinese government should also encourage MNCs to participate in forming the competition environment and to increase the intensity of technology transfer in China, so as to create conditions for effective use of foreign investment in China.

5.3.2 R&D encouragement

Referring to Fig. 8, R&D internal expenditure of IT industry in China accounted for only about 20% of the total spending, that is, nearly 80% percent of R&D spending from foreign-funded enterprises. That means that FDI largely contributes to the capital formation of IT industry in China, as provided valuable capital resources for China's IT industries. The government should create a better FDI environment and modify laws and regulations which are applied to the IT industry enterprises to enlarge the foreign investment in the R&D. For the R&D project, especially for the cooperative R&D project, government should continue to give foreign investment enterprises a variety of policy support, to encourage the foreign investment enterprise to set up R&D centers in China and develop more R&D activities in China. When FDI company set up R&D center, they face quite a few problems, in terms of usage cost of land and space. And they also face the lack of other infrastructure investment. So government should give more

favorable measures as much as possible in the cost of land. many foreign-funded R&D center participate in government support of R&D projects and so on.

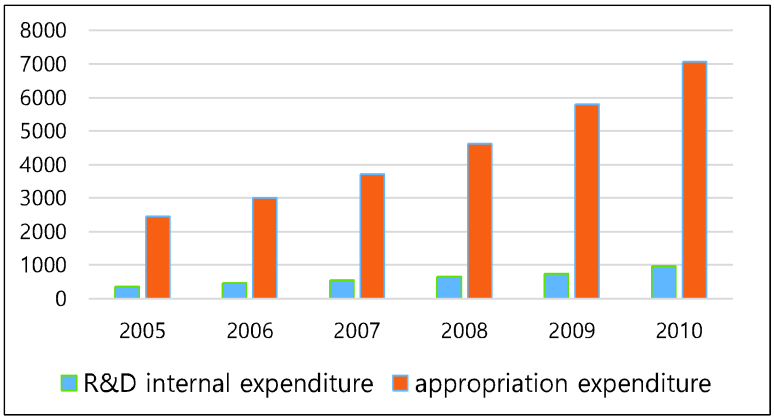

Fig. 8 Chinese high-tech industry R&D expenditure

source: *China's high technology industry statistics yearbook 2005-2010*

Because MNCs try to maintain the power of technological monopoly and don't want technology transferred to other company without returns, their right should be protected from infringement of other companies. In this point, the issues related to intellectual properties are very important. In order to attract MNCs so that they may transfer advanced technology and set up R&D institutions. It is getting more serions to create a good intellectual property protection environment.

However, compared with developed countries, the level of protection of intellectual property rights in China also has the big disparity. And as I mentioned above, the reverse technology diffusion which happens to our present enterprises is becoming more and more serious. Due to the asymmetry of technology, it is possible for MNCs to use the technology the domestic scientific research centers produce at a low price or even freely. To prevent this kind of behaviors Chinese government must prepare the laws to protect the intellectual property rights.

5.4 Fostering Innovation

5.4.1 R&D ability of local companies

As FDI has flowed into China steadily, the process of the learning and imitation for the advanced production technology and management experience should be systematically implemented. Based on this, China can have an opportunity to strengthen our scientific research innovation ability, to improve the product quality and to increase the competitiveness for science and technology in terms of domestic enterprises. IT industry is a representative industry with high investment, high risk and high income. So more support should be made to develop the IT industry.

The government should plan and conduct the fiscal investment to strengthen the capital investment of R&D and establish a national steering to provide the electronic information products. Specifically First, some preferential taxation policy and laws should be taken in the financial and legal way, which speed up the pace of independent R&D of IT industry backbone technology, the development of high value-added information terminal and products, and cultivate and develop a new growth point of China's IT industry. Second, It should also promote industry service platform construction and support the construction of R&D platform and testing platform. Third, we should increase support the enterprise technology R&D, promote the construction of public technology platform, and make the small and mediumsized electronic information capacity get technical support easily.

5.4.2 FDI enterprises and Chinese scientific research institutions

FDI has so far mainly been done to the manufacturing industry which has the low value-added and low level of technology of processing in the IT industry. Most of MNCs have taken advantage of a wholly foreign-owned enterprise as the main channel for foreign direct investment. Based on

technology spillover, wholly foreign-funded enterprises tend to set up independent R&D institutions. Original goal to allow them to run sole proprietorship is to get technology spillover effect in Chinese IT industry. But for MNCs to protect their technology, they set up their own R&D center and run it very tightly. So it is not easy to do learning and imitating advanced technology and management experience. So the government should encourage MNCs to use more the type of non-sole proprietorship and to establish China's R&D institution and to strengthen the relationship with scientific research institutions in our country. If China wants to attract foreign investment companies to build R&D center in China, first of all, it should maintain competitive market in our country, and keep the advantage of low cost for resources and manpower, and optimize the investment environment. Secondly, it should strengthen the cultivation of the IT industries' protection, improve the level of supply for the talent needed in IT industry, strength the construction of national engineering laboratory and attract more world top 500 electronic information company to set up R&D centers in China.

Chapter 6 Conclusion

Over the last two decades, Chinese IT industry has experienced impressive growth and has become a key industry in the country's overall economy. In the current 5-year plan, China is planning to make IT as one of the seven strategic industries that will help the country become a world-class, innovation driven, and high-tech society, moving from a cheap-labor manufacturing outsourcing. Over the past years, China has already seen creative and innovative developments in the sector, stimulated by foreign investors and many (small) domestic private players.

The characteristics of Chinese IT industries using the foreign capital mainly has the following several aspects:

First, in Chinese IT industry is FDI used earliest and most abundantly in the manufacturing industries. As the foreign capital utilization increases year by year, the market share of the foreign companies in Chinese IT industry has been extended. It is not too much to say that MNCs almost dominate in the electronic information industry in China. Large investments have already been thrown into the IT industry of China for the development of IT technologies. In gross value of industrial output, sales revenue and profits, they accounted for more than 70%. Second, Chinese IT industry has obvious accumulation effect on attracting foreign investment, which is mainly concentrated in the pearl river delta, the Yangtze river delta, Bohai sea coastal areas and in Xiamen, Fujian. And the IT output value in the four industrial area accounts for more than 80% in national output. They formed the different characteristics of electronic information industry base in China. When Chinese

IT industry used FDI, there are many problems including repeated investment, regional investment imbalance, lack of core technology and serious pollution and so on.

In this paper, I think that FDI has played a positive role on promoting Chinese IT industry scale, enhancing the export competitiveness and promoting technological progress. However, this development pattern which depends heavily on foreign capital and external market also has some problems including lack of core technology, low technical innovation ability and immaturity of self-owned intellectual property rights produced by domestic enterprises. But the big challenge is that the performance of technology transfer and technology spillover effect for Chinese IT companies is poorer that it is expected. In view of the fact that the electronic information industry plays a great role in attracting FDI to China.

Chinese government can use some preferential policies and foster good investment environments. To do that, it should prepare an attractive guidance to derive foreign investment in the high technology industry. By optimizing the structure of foreign investment, it tries to solve the problem of the core technology transfer to IT industry in our country. Then China can promote the industrial structural change in Chinese IT industry.

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