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China's Policies on FDI: Review and Evaluation

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Foreign direct investment (FDI) has been one of the most discussed topics in the drive for economic globalization. Multinational corporations (MNCs) consider FDI an important means to reorganize their production activities across borders, in accordance with their corporate strategies and the competitive advantages of host countries. Host countries regard inflow of FDI as a significant opportunity for integrating their economies into the global market and promoting their economic development. To maximize FDI's benefits in economic development, host country governments employ a variety of policies and measures. Performance requirements might serve as an important policy tool in this regard, since they help enhance the benefits brought along by, and address those concerns in relation to, FDI inflow. However, the effectiveness of performance requirements still remains a controversial issue: A number of developing countries believe that performance requirements require foreign-invested enterprises' (FIE) compliance with host countries' development objectives, while critics, especially those hailing from developed countries, question their effectiveness. Though some performance requirements were called off after China's accession to the World Trade Organization (WTO), certain voluntary performance requirements remain.

Since 1993, China has been boasting the largest amount of FDI inflow of all developing countries, with about 90 percent of it brought in by green-

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field investment. FDI has played an important role in contributing to the country's economic/trade development and institutional reform. In fact, the Chinese government has already formulated a series of FDI policies, such as tax incentives and the Guiding Directory on Industries Open to Foreign Investment.

This study evaluates FDI's impact in China and the effectiveness of China's policies governing FDI with regard to export trade and technological advancement. The second section briefly describes the evolution of FDI in China, and the third section summarizes China's FDI policies. The fourth section then evaluates the influence exerted by FDI policies upon export performance requirements, while the fifth section aims to evaluate the effectiveness of technological performance requirements. It ends with a summary conclusion in the sixth section.

The Evolution of FDI in China

Basic Patterns

Since 1993 China has been the biggest developing host country in the world. In fact, by the end of 2003, China had accumulated more than $500 billion in FDI (figure 12.1).[1] FDI in China occurs through joint ventures,[2] cooperative enterprises,[3] and solely foreign-owned enterprises (table 12.1). However, solely foreign-owned enterprises were not permitted unless they either adopted advanced technology and equipment or exported a majority of their products.[4] In 2001, China removed these restrictions, which were also contrary to their WTO commitments, and encouraged foreign-owned enterprises to usher in advanced technology and increase their export volume.[5] As a result, solely foreign-owned enterprises replaced joint ventures as the most popular form of FDI in China.

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1. Throughout the chapter, all dollar amounts are based on the US dollar unless otherwise noted.

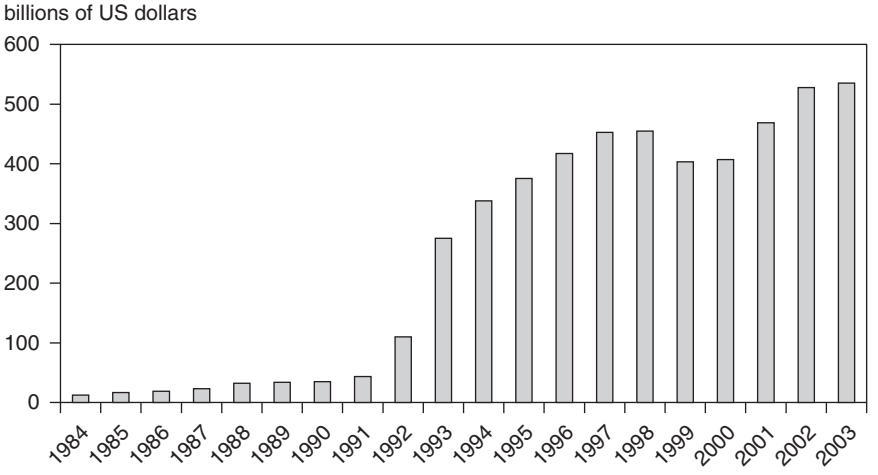
2. Joint ventures refer to enterprises composed of joint investments by foreign companies, enterprises, and other economic organizations or individuals and Chinese companies, enterprises, or other economic organizations. In China, however, foreign parties are required to contribute at least 25 percent of the total capital, which is higher than the 10 percent required by the Organization for Economic Cooperation and Development (OECD) countries and others.

3. Cooperative enterprises are also called "agreement-based partnership businesses," since they are based on cooperative terms and conditions agreed upon by foreign companies, enterprises, and other economic organizations or individuals together with Chinese companies, enterprises, or other economic organizations.

4. See the 1990 *Detailed Implementing Rules for the Law of the People's Republic of China on Wholly Foreign-Owned Enterprises.*

5. See the 2001 *Detailed Implementing Rules for the Law of the People's Republic of China on Wholly Foreign-Owned Enterprises.*

Figure 12.1 FDI in China, 1984–2003



Source: China Ministry of Commerce.

Sources of FDI in China

East Asia, particularly Hong Kong, is the most important origin of China's FDI. In 2002, Hong Kong's accumulated paid-in FDI amounted to $204.9 billion. Based on official statistical data, Taiwan is also a pivotal origin of China's FDI with an accumulated $33.1 billion. In fact, quite a few Taiwanese businessmen invested in mainland China via such springboards as Hong Kong, the Virgin Islands, and the Cayman Islands in order to avoid the multiple restrictions exerted by the incumbent Taiwan authority. Indeed, the actual amount of Taiwan-originated investment in mainland China may be two to three times the amount publicly acknowledged. Therefore, it is unsurprising that Taiwan ranks as the second most important place of origin of FDI in China. In addition, the United States, Japan, and some developed countries in Europe have also contributed to FDI in China (see table 12.2). It is worth pointing out that renowned FIEs from developed countries have been the primary investors in China, and they fund large-scale capital- and technology-intensive projects. The presence of these FIEs, such as IBM, GE, GM, Motorola, Sony, and Samsung, is particularly significant for China since it signals the greater possibility of even more future foreign investment.

Distribution of FDI in Various Chinese Industries

More than 80 percent of FDI in China is greenfield investments, and most FDI is in the manufacturing industry. At the end of 2001, FDI in manu-

Table 12.1 Proportional relationship among different patterns of FDI in China (cumulated to 2002 dollars)

	Number of projects	Ratio (percent)	Contract amount (billions of dollars)	Ratio (percent)	Amount realized (billions of dollars)	Ratio (percent)
Joint venture	225,883	53.25	326	39.56	192	42.91
Cooperative	52,965	12.49	163	19.72	83	18.48
Solely foreign owned	145,165	34.22	333	40.16	166	36.97
Others	183	0.04	5	0.56	7	1.64
Total	**424,196**	**100.00**	**828**	**100.00**	**448**	**100.00**

Source: China Ministry of Commerce (2003, 127).

facturing industry constituted 70 percent of total FDI projects, 56 percent of the aggregate amount of FDI, and 60 percent of the aggregate amount of registered capital in FDI in China. In the services sector, FDI is mainly poured into the real estate industry. The investment in the primary industry occupies a rather low proportion of the total investment amount (table 12.3). A majority of FDI has gone into the manufacturing industry because China possesses a competitive edge thanks to its lower costs of production and relatively powerful ability to supply supporting parts. In contrast, China has strictly controlled the flow of FDI into the services sector for a long period.

China's FDI Policies

For the last 25 years, China has aggressively shaped a relatively complete range of laws and regulations governing foreign investment. They include the Law of the People's Republic of China upon Foreign Wholly Owned Enterprises, Law of the People's Republic of China upon Sino-Foreign Joint Ventures, Law of the People's Republic of China upon Sino-Foreign Cooperative Enterprises, and the Guiding Directory on Industries Open to Foreign Investment. China's laws and regulations on FDI also include related preferential policies and stipulations for special economic zones in the country.

In a nutshell, China encourages favorable FDI policies. Therefore, FIEs enjoy preferential treatment when compared to domestic enterprises. In fact, FIEs are entitled to markedly different treatments depending on the region and industry, and this differential treatment is outlined by policies. Furthermore, the Chinese government has stipulated different FDI performance requirements depending on these distinctions.

China has designated certain parts of the country as special economic areas and each is governed by different policies. China has also enforced two policies called Develop China's West at Full Blast and Strategy of

Table 12.2 Top 15 sources of FDI in China (cumulated to the end of 2002 dollars)

	Number of projects	Share (percent)	Contract amount (billions of dollars)	Share (percent)	FDI realized (billions of dollars)	Share (percent)
Hong Kong	210,876	49.71	373.8	45.14	204.9	45.73
United States	37,280	8.79	76.3	9.21	39.9	8.90
Japan	25,147	5.93	49.5	5.98	36.3	8.11
Taiwan	55,691	13.13	61.5	7.42	33.1	7.39
Virgin Islands	6,659	1.57	49.3	5.96	24.4	5.44
Singapore	10,727	2.53	40.1	4.85	21.5	4.79
South Korea	22,208	5.24	27.5	3.32	15.2	3.39
United Kingdom	3,418	0.81	19.6	2.37	10.7	2.39
Germany	3,053	0.72	14.3	1.73	8.0	1.78
France	2,033	0.48	7.2	0.87	5.5	1.24
Macao	7,827	1.85	10.8	1.34	4.7	1.07
Netherlands	1,065	0.25	9.0	1.08	4.3	0.97
Cayman Islands	706	0.17	9.5	1.14	3.8	0.85
Canada	6,040	1.42	10.4	1.25	3.4	0.75
Malaysia	2,538	0.60	6.2	0.75	2.8	0.63
Others	28,928	6.82	63.0	7.61	29.4	6.55
Total	**424,196**	**100.00**	**828.1**	**100.00**	**448.0**	**100.00**

Source: China Ministry of Commerce (2003, 131).

Reviving Rusty Industrial Bases to encourage FDI into its western and northeast regions. Therefore, FDI policies in China's western region entitle foreign enterprises to even more preferential treatment than in other regions of the country.

The Chinese government pays much attention to industrial guidance on FDI. In June 1995, China first promulgated the Provisional Regulations upon Guidance for Foreign Investment Orientations and the Guiding Directory on Industries Open to Foreign Investment. Furthermore, the different preferential treatments granted to enterprises in various industries have mainly been determined under the Guiding Directory. This Guiding Directory was revised first in December 1997, and then again in April 2002 because of China's accession to the WTO. The Guiding Directory is important because it divides FDI-involved projects into four categories: projects that were encouraged, allowed, restricted, and prohibited. These categories are then subdivided even further. For instance, 262 types of encouraged projects, 75 types of restricted projects, and 34 types of prohibited projects exist.

China currently encourages FDI for the purposes of

- transforming traditional agriculture, developing modern agriculture, and promoting the industrialization of agriculture;
- producing transportation infrastructure, energy sources, and raw materials, and other basic industries;

Table 12.3 Distribution of accumulated FDI in different industries in China (to the end of 2001)

Sector	Number of companies		Investment amount		Registration capital amount		By foreign investors	
	Number	Share (percent)	Millions of dollars	Share (percent)	Millions of dollars	Share (percent)	Millions of dollars	Share (percent)
Agriculture	4,752	2.35	9,135	1.04	6,180	1.22	4,763	1.32
Mining	1,047	0.52	3,282	0.38	2,317	0.46	1,462	0.41
Manufacturing	141,668	70.03	491,322	56.15	305,250	60.35	214,931	59.76
Electricity, gas, and water	1,268	0.63	49,505	5.66	20,039	3.96	11,606	3.23
Construction	5,139	2.54	21,547	2.46	11,862	2.35	7,743	2.15
Geology investigation	128	0.06	4,237	0.48	1,545	0.31	1,412	0.39
Logistics and communication	3,499	1.73	41,442	4.74	20,432	4.04	15,163	4.22
Distribution	12,249	6.05	24,592	2.81	15,585	3.08	11,311	3.14
Finance and insurance	74	0.04	2,089	0.24	1,965	0.39	1,415	0.39
Real estate	11,925	5.89	149,094	17.04	72,244	14.28	55,536	15.44
Social services	16,169	7.99	56,274	6.43	34,020	6.73	23,188	6.45
Health and sports	469	0.23	2,774	0.32	1,543	0.31	1,128	0.31
Education, culture, and films	530	0.26	1,390	0.16	982	0.19	675	0.19
R&D and technology service	1,851	0.91	4,334	0.50	2,752	0.54	2,171	0.60
Others	1,538	0.76	13,994	1.60	9,079	1.80	7,179	2.00
Total	**202,306**	**100.00**	**875,011**	**100.00**	**505,793**	**100.00**	**359,683**	**100.00**

Sources: China Statistical Yearbook 2002, tables 17–19. Percentages were calculated by the author.

- tapping into cutting-edge, technology-oriented industries such as electronic information, bioengineering, new materials, and aviation and aerospace, as well as establishing local R&D centers;
- encouraging foreign businesses to utilize advanced and applicable techniques to transform traditional industries such as machinery, textiles, and consumption goods manufacturing industries as well as to upgrade their equipment and facilities;
- using raw and renewable resources comprehensively, initiating environmental protection projects, and modernizing public utilities;
- encouraging export-oriented FDI projects; and
- building up the industries in China's western region.

In the past, China's FDI laws included some performance requirements. However, to meet WTO membership requirements, within a year of its entry into the organization China revised its three laws and removed the FDI requirements regarding such criteria as export proportion, local contents, balance of foreign exchanges, technology transfer, and creation of R&D centers. The remaining restriction limited ownership share on projects falling in the "restricted" category.[6] However, in practice, the Chinese partners of some joint ventures or cooperatives privately require technology sharing or transfer from FIE foreign investors.

Export Performance Requirement Policies' Influence on FDI

China's FDI policies are complicated. When designing such a set of policies, multiple objectives must be met, including

- strengthening the country's industrial base and increasing the domestic value added,
- promoting linkages,
- generating and increasing the level of exports,
- balancing trade,
- promoting regional development, and
- transferring technology.

6. There is no definition of the "restricted" category. Projects falling in this category, such as small electricity stations, usually face some difficulties in securing the approval of the government.

Among these criteria, promoting exports and transferring technology (technological advancement) are China's two most important FDI objectives. This chapter examines whether China's FDI policies regarding these two objectives are effective.

Before China became a member of the WTO, its FDI policies regarding exports could be divided into three categories: compulsory, neutral, and voluntary.

Compulsory policies required that "FDI shall be able to keep a balance of exchanges, or make sure the proportion of their domestically made products in the total number of products reaches a certain benchmark, or a certain percentage of their products must be exported."[7] However, since such requirements are inconsistent with the WTO Agreement on Trade-Related Investment Measures (TRIMs), these compulsory provisions were eliminated.

Neutral polices tried to create fair conditions for exports to compete internationally. For example, the tariff and VAT exemptions on reexport processing imports would level the ground for China's companies to compete in overseas markets. Voluntary policies to promote exports were encouraged. For example, an enterprise with 70 percent of export products is entitled to a 50 percent cut in corporate income tax. Thus, major exporters enjoy more favorable treatment in terms of trade, and these policies have been linked with increasing the level of export performance of enterprises.

This chapter next will analyze the following data to evaluate the effectiveness of China's FDI policies to promote exports.

Export Performance of FDI

After a lapse of 25 years, in 2003 China ranked 4th among other countries in the world's international trade chart, which was a major improvement from its 32nd rank in 1978. China's rapid rise as a trading power has been considered a global economic miracle, and FDI has played a crucial role in developing China's foreign trade.

Table 12.4 displays the development of China's foreign trade as well as the export and import performance of FIEs. As illustrated in the table, the export value registered by FIEs made up only 1.94 percent of China's total export value in 1986, but had climbed up to 54.81 percent in 2003. Between 1986 and 2003, FIEs contributed up to 58.8 percent to China's total increase of export and 62 percent to its increase of import value.

7. Law on Foreign-Invested Enterprises, PRC.

Table 12.4 Development of China's foreign trade by FIEs, 1986–2003 (billions of dollars, percent)

Year	Foreign trade turnover			Export			Import		
	Total	By FDI	Percent of FDI	Total	By FDI	Percent of FDI	Total	By FDI	Percent of FDI
1986	73.8	3.0	4.07	30.9	0.6	1.94	42.9	2.4	5.59
1987	82.7	4.6	5.56	39.4	1.2	3.05	43.3	3.4	7.85
1988	102.8	8.3	8.07	47.5	2.5	5.26	55.3	5.8	10.49
1989	111.7	13.7	12.26	32.5	4.9	15.08	79.2	8.8	11.11
1990	115.4	20.1	17.42	62.1	7.8	12.56	53.3	12.3	23.08
1991	135.7	29.0	21.37	71.9	12.0	16.69	63.8	17.0	26.65
1992	165.5	43.7	26.40	84.9	17.4	20.49	80.6	26.3	32.63
1993	195.7	67.1	34.29	91.7	25.2	27.48	104.0	41.9	40.29
1994	236.6	87.6	37.02	122.1	34.7	28.42	114.5	52.9	46.20
1995	280.8	109.8	39.10	148.8	46.9	31.52	132.0	62.9	47.65
1996	289.9	137.1	47.29	151.1	61.5	40.70	138.8	75.6	54.47
1997	325.1	152.6	46.94	182.7	74.9	41.00	142.4	77.7	54.56
1998	323.9	157.7	48.69	183.8	81.0	44.07	140.1	76.7	54.75
1999	360.6	174.5	48.39	194.9	88.6	45.46	165.7	85.9	51.84
2000	474.3	236.7	49.91	249.2	119.4	47.91	225.1	117.3	52.11
2001	509.7	259.1	50.83	266.1	133.2	50.06	343.6	125.9	36.64
2002	620.8	330.2	53.19	325.6	169.9	52.18	295.2	160.3	54.30
2003	851.2	472.2	55.47	438.4	240.3	54.81	412.8	231.9	56.18

FIEs = foreign-invested enterprises

Source: China General Custom, *Custom Statistics, 2003;* China Ministry of Commerce (2003).

Reasons for China's Predominantly Export-Oriented FDI

On the whole, transnational investment can be divided into two categories: In "domestic-market seeking" investment, investors seek to enter the host country's local market. In "export-oriented" or "efficiency-pursuing" investment, investors establish production bases in the host country but export most of their products to the global market. In the past, China's domestic market was small, and the country's restrictive FDI policies prohibiting FIEs from selling locally made sense. Furthermore, China was an ideal low-cost production location to manufacture goods to export. For instance, the wage levels in the United States, Japan, South Korea, and Taiwan are 47.8 times, 29.9 times, 12.9 times, and 20.6 times, respectively, those of China. Today, compared with developed and even developing countries, China has lower production costs, and, equally important, its domestic market has enormous potential for growth. Moreover, China implemented an import substitution strategy between 1949 and 1979, established a relatively complete industrial base, and trained a large number of skilled workers. All of these factors make China an ideal base for production, particularly for East Asia's FIEs. In fact, in 2002, the Japan External Trade Organization (JETRO) (2003) surveyed the overseas branches of Japanese companies and found that the percentage of surveyed companies exporting more than 70 percent of their products is 61.6 percent in China overall, with a staggering 82.5 percent in southern China, compared with the average 55.9 percent for those located in all of Asia. Another 2002 survey, conducted by the Japan Bank for International Cooperation (JBIC), found that 68.9 percent of Japanese enterprises invested in China because of its cheaper labor cost, 25.2 percent considered the country an ideal production base to export products to the global market, and 26.8 percent thought it was an ideal location to export to Japan.

The constant inflow of FDI into China has actually strengthened its capacity to be a production base for manufacturing exports. A "domino effect" inevitably occurs when FIEs in the same industry compete with one another, particularly if they are concentrated in the same region. The competition boosts the development of some supporting industries, improves the general economic climate within these supporting industries, and essentially establishes an important industrial cluster. For example, China's Pearl River Delta and Yangtze River Delta regions have emerged as world-class information technology (IT) clusters. The formation of such industrial clusters helps China absorb an ever increasing amount of FDI, which in turn attracts more foreign investment. Thus, it is unsurprising to find that a 2003 American Chamber of Commerce in China survey of its members found that 56 percent chose to invest in the country because of its ideal location as a production base for global exports and its growing domestic market.

Table 12.5 Export tendency: A comparison of domestic enterprises and FIEs 1998–2002 (billions of dollars)

Year	Export by domestic enterprises	Industrial output of domestic enterprises	Export tendency of domestic enterprises (percent)	Export by FIEs	Industrial output of FIEs	Export tendency of FIEs (percent)
1998	85.32	509.8	16.74	67.23	167.6	40.12
1999	88.23	537.5	16.41	73.54	189.5	38.80
2000	107.73	622.1	17.32	99.10	234.6	42.24
2001	110.31	682.3	16.17	110.56	272.2	40.62
2002	129.23	784.8	16.47	141.02	319.3	44.17

Export tendency = export's share in industrial output
FIEs = foreign-invested enterprises

Note: Industrial output of domestic enterprises refers to that of all state-owned enterprises (SOEs) and non-SOEs with an industrial output higher than 5 million renminbi (equivalent to about $600,000). Data of industrial output for all domestic enterprises are not available after 1999 due to adjustments made by the competent Statistics Authority. Thus, the exporting trend of domestic enterprises is overrated. For example, the exporting tendency of domestic enterprises using data of industrial output for all enterprises is 8.32 percent, only about half of that shown in the table.

Sources: China Statistical Abstract 2003; China Customs Statistics, various years; Jiang (2002).

Effectiveness of China's Export Promotion Policies

China's policies for promoting the exports of FDI have been increasingly effective. As noted earlier, before China's membership in the WTO, there were a number of restrictive policies governing FDI that diverted many potential investors to other countries, especially since the domestic market was small and largely unavailable to FIEs. Those who did invest in China despite the restrictions did so primarily for its lower production costs and to export its products (table 12.5).

China's processing trade policy, which exempts input imports for reexport from tariff and value-added tax (VAT), has improved the country's export value tremendously. Two kinds of processing trade exist in China: processing trade with imported materials (PTI) and processing trade with materials supplied by clients (PTS).[8]

Prior to China's WTO membership, the country maintained a relatively high tariff level (e.g., the average level was 55.6 percent in 1982 and

8. Under the PTS pattern, FIEs provide domestic enterprises with intermediate materials such as spare parts and also pay them processing fees. Under the PTI pattern, domestic enterprises purchase imported spare parts and other intermediate materials themselves and then export the finished products after processing and assembling.

43.2 percent in 1992). After China reformed its tax system in 1994,[9] imports were subject to a new 17 percent VAT; and certain imports (e.g., the automobile industry) are further subject to a 10 percent excise tax. Under such a high tariff/VAT system, without any exemptions on imports for PTI or PTS, there would be an incredible decrease in Chinese exports. In order to eliminate this possibility, China implemented the exemption policy immediately after initiating its reform and open policies. Thus, imported raw materials and spare parts used in the export processing industry are exempt from tariff and VAT from the outset and any verification will occur after the finished goods have been exported. However, if the products are not exported and are sold domestically, FIEs will be charged the relevant tariff and VAT taxes. However, China's policy, in order to encourage domestic value added of exports, allows imported raw materials and spare parts to be sold to downstream processing enterprises without levying tariffs/VAT, as long as the processed materials are eventually exported.

Thus, China's processing trade policy has played an important role in helping China attract FDI and expand its exports. Without these exemptions, most of China's early foreign investors would not have invested in the country. In fact, processing trade has always remained the principal mode of FIE exports, and it currently contributes 80 percent of the total export value by FIEs.

Policy factors have also had a significant influence on FIE domestic purchases. As domestic supporting industries have evolved and improved and VAT reimbursement has been implemented, the percentage of local content of China's exports in the processing trade has markedly increased. In 1993, the "domestic value increment rate"[10] recorded in PTI was 17.3 percent, while it was 18.5 percent for PTS. In 2003, the domestic value increment rates of FIE exports climbed to 23.3 percent for PTI and 31.4 percent for PTS. What factors led to the difference between the domestic value increment rates of these two different trading modes? The most viable explanation for the difference lies in the "VAT reimbursement for exports" policy, noted earlier, that China implemented toward these two different trading modes: domestically purchased materials used in PTI may be reimbursed but not in PTS. Essentially, companies engaged in PTI can receive a tax rebate equal to 17 percent of the value of domestically purchased materials, but PTS companies cannot. Such a cost difference is large enough to force enterprises to make a prudent decision on where to purchase materials: domestically or abroad. Although initiated to provide equal footing for domestic raw materials, the opposite effect has occurred. The difference between PTI and PTS in terms of the domestic value increment rate has indicated that the VAT

9. Since this 1994 reform, the VAT imposed upon domestically purchased materials can be reimbursed for PTI; however, the "VAT reimbursement for exports" policy does not apply to PTS.

10. Domestic value increment rate = (export – imported inputs)/export*100%.

reimbursement for exports policy has effectively impacted purchasing decisions of FIEs toward imported raw materials and spare parts.

China's policies to promote exports have also affected FDI. For example, an FIE with an export ratio higher than 70 percent receives a 50 percent corporate income tax "discount." In fact, in a survey I conducted in 2001, 121 enterprises, or 27 percent, with higher than 70 percent export ratios received a corporate income tax "discount." Although not precise, the finding illustrates that China's policies have affected FDI and export performance. For example, as figure 12.2 illustrates, when enterprises were asked what the most important factor that influenced their decision to conduct processing trade in China was, most stated that the country's favorable FDI policies were the main factor (8.4 points out of a total 11 points).

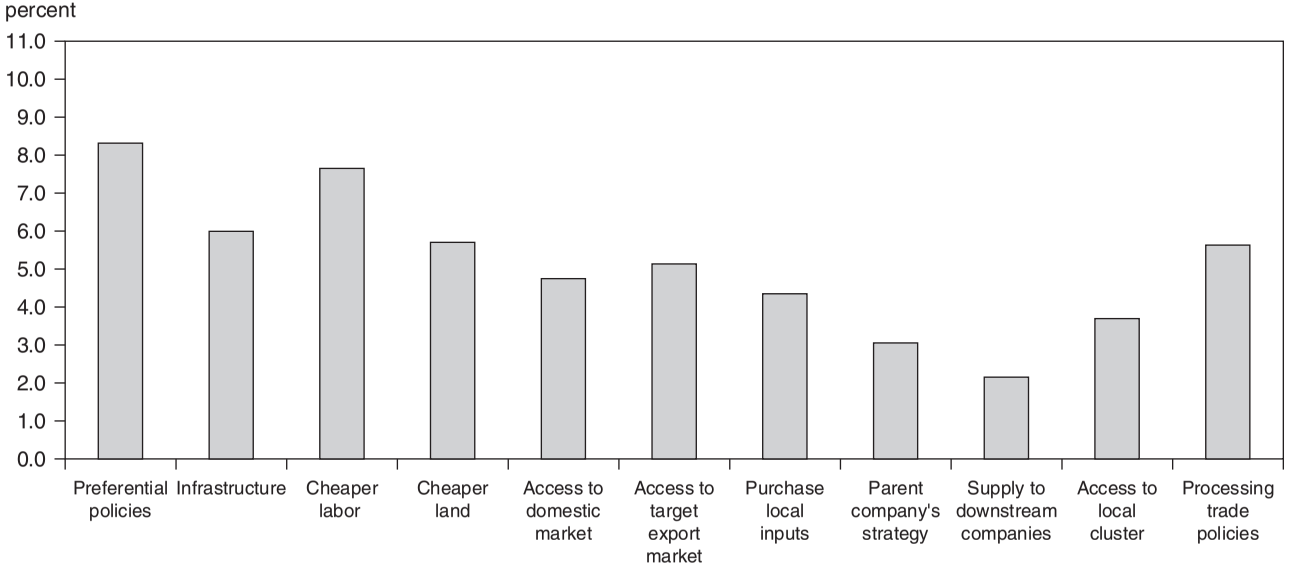
FDI's Contribution to Advancing China's Technological Capability

Like many other developing countries, one of China's major goals for FDI is to advance its technological capability. With its FDI policies, China not only encourages technology into the country, but also seeks to establish more R&D centers. China also seeks to use FDI to transform its traditional industries through advanced and applicable technology.

Introducing Advanced Technology

FDI's contribution to advancing China's technological capability can be divided into three types: filling in the technological gaps, introducing advanced technology, and improving existing technology. According to several investigations, FDI has introduced a significant amount of advanced technology. Dr. Xiaojuan Jiang (2002, 52) chaired a survey of 127 FIEs that showed 83 respondents, or 65 percent of FIEs, adopted some technology that filled in certain technological gaps in China while 44 respondents, or 35 percent of FIEs, used domestically advanced technology. In another two surveys that Professor Zhile Wang (1995) chaired, similar results were found. One survey of 33 global FIEs found that 52 percent employed some technology that filled in the technological gaps in China (Zhile Wang 1995); the second survey of 40 Japanese enterprises in China found that 95 percent either employed some technology that filled in certain technological gaps in China or adopted some advanced technology (Zhile Wang 1998). In yet another survey, among all the FDI projects in Beijing's industrial sector, 81 percent ushered in advanced technology from abroad, which helped advance its domestic technological skill level by about 15 years (He and Zhang 1999). I also chaired a survey (Long et al. 2003) of 442 FIEs engaged in China's processing trade. The survey found that 26.8 percent

Figure 12.2 Factors affecting the decision of FIEs doing export processing in China



Source: Long et al. (2003, 162).

Table 12.6 Difference of technology used by type of FDI (percent)

Type of FDI	1	2	3	4	5
Domestic majority-owned joint ventures	5.8	2.3	52.3	5.8	33.7
Equally shared joint ventures	22.6	0	41.9	9.7	25.8
Foreign majority-owned joint ventures	39.7	1.3	26.9	17.9	14.1
Solely foreign-owned	31.7	1.7	29.4	23.3	16.7
Cooperative foreign-owned	28.0	6.0	32.2	2.0	24.0
Total foreign-owned	26.8	2.1	34.8	15.3	21.2

Columns:
1. The most advanced technology in parent companies.
2. Technology not available in China.
3. Equal to the most advanced technology used in China before the surveyed company was established.
4. Ordinary technology in parent companies, less advanced than 3.
5. Technology broadly used in China, the least advanced level.

Source: Long et al. (2003).

of the enterprises used the most advanced technologies of their parent companies, while 2.1 percent used technology not previously used in the country and 34.8 percent adopted technology that measured up to China's most advanced level. Unsurprisingly, foreign wholly-owned and majority-owned FDI tend to use more advanced technologies (table 12.6).

FDI in China has constantly upgraded the country's technological level as result of increasing competition. According to the results of the same survey I chaired (Long et al. 2003) 29.9 percent of the 442 FIEs registered "great technological advancement," 61.5 percent registered "some certain technological advancement," and 7.3 percent registered "no technological advancement," while 1.3 percent posted "some technological backslide." According to the findings of a tracing investigation chaired by Dr. Jiang (Jiang 2002) among FIEs surveyed in 2002, 60 percent employed advanced technology (i.e., technology at the same level as employed by their parent companies), while 40 percent adopted relatively advanced technology (i.e., lagged by 2 to 3 years behind the technology of their parent companies). In contrast, these two figures in 1997 were 13 percent and 54 percent, respectively (table 12.7).

Establishing R&D Centers

Since 1999, China's official FDI policies have encouraged foreign investors to establish their R&D centers in the country. For example, major policies include:

- any imported equipment and supporting technology confined to the FIE's laboratory and used for pilot experiments (and not production) are exempt from tariff and other import taxes;

Table 12.7 Technological skill level of FIEs in China (percent)

Level	1997	2002
Technology at the same level as their parent company	13	60
Technology lagging 2–3 years behind their parent company	54	40
Technology that their parent company has washed out	33	—

FIEs = foreign-invested enterprises

Source: Jiang (2004).

- income from the transfer of technology that has been developed solely by an FIE is exempt from sales tax;
- an FIE with technological development expenses at least 10 percent over its previous year is entitled to a 50 percent discount of its total technological development expenses in the current year's corporate income tax (subject to approval by the taxation authority); and
- FIEs with R&D centers in China are allowed to import and sell a small quantity of high-tech products on a trial basis in the local market, if they are goods produced as a result of the R&D by their parent companies (China Ministry of Commerce 2003, 107).

In addition, China's regional governments offer multiple preferential policies for FIEs in a number of ways, including reduced land use fees and assistance with employee recruitment.

As 2002 official data showed, about 400 FIEs have established independent R&D centers in China; Microsoft, GE, Motorola, Intel, GM, Honda, Siemens, Nortel, and Volkswagen head the list. Earlier, these R&D centers were mainly engaged in technological R&D activities geared toward transforming products for local market consumers. Recently, particularly in the last two years, some strategic-minded FIEs such as Microsoft and GE began to initiate R&D activities in their China R&D centers for the global market (Jiang 2004). Most FIEs establish R&D centers within their respective companies. According to the findings of the survey I chaired (Long et al. 2003), of the 442 FIEs engaged in the processing trade, 1.27 percent not only meet their own demands but also sell technology patents, 48.28 percent can meet most of their own demands, and 22.06 percent can meet some of their own demands. However, 28.59 percent of the surveyed FIEs do not have an R&D center (Long et al. 2003, 76).

FIEs establish R&D centers in China for a number of reasons. First, they do so in order to meet their business needs. As noted earlier, China has become an increasingly important market and/or production base so products need to be redesigned to meet local demand. Thus, R&D and manufacturing become more intricately entwined. Second, FIEs can readily take advantage of China's wealth of scientific research and technological talent. FIEs have established their R&D centers in regions where colleges and uni-

versities exist so they can recruit talent at lower cost than in other countries. In fact, these R&D FIE centers work cooperatively with many Chinese scientific research organizations. For example, the Swiss Novartis Company works with Shanghai Institute of Materia Medica under the Chinese Academy of Sciences to study and develop new types of drugs made of natural ingredients. Last, setting up R&D centers in China is a policy criterion that improves relations between governments. For seeking a long-term presence in China, establishing R&D centers in the country not only wins favor from the Chinese government but also helps the FIEs' business by helping them tailor products to the local market. It is a win-win situation for everyone involved.

Generating Technological Spillover Effects

Host countries must try their best to prevent crowding-out effects toward domestic enterprises from FIEs' R&D and to make full use of their spillover effects.

FIEs generate technology spillover effects most often when: developing and producing new products in the local market, providing technical assistance to supporting enterprises to meet new technology requirements, collaborating for developing technology, training and then losing staff to domestic companies, and providing domestic enterprises with a manufacturing base from which to develop new products. As a developing country, China has lagged behind developed countries in terms of developing new products. For instance, when the mobile communication market emerged, equipment and mobile phones were all either imported or produced by FIEs in China. Thus, FIEs helped develop this market. The market's quick growth and high profitability drove local Chinese enterprises to quickly and successfully engage in the industry by working with FIEs through joint ventures and cooperative companies. China is regarded as the world's largest mobile communications market, and in the mobile phone market, domestic brand products make up more than 60 percent of the total market share.[11]

After entering the Chinese market, FIEs typically develop a "vertical division of labor" with domestic enterprises. For example, Motorola is supplied by up to 80 supporting enterprises in Tianjin, where it established a plant, and also by 170 other supporting enterprises outside Tianjin. In order to ensure consistent product quality, FIEs often stipulate specific ordering requirements to their local suppliers. These requirements are

11. China's domestic enterprises began producing mobile phones in 1999. In 1999, the market share of domestic brand mobile phones was 2 percent and has increased significantly in a short time. Market share of domestic brand mobile phones was 8 percent in 2000, 15 percent in 2001, 30 percent in 2002, and 60 percent in the first 10 months of 2003 (*Beijing Newspaper*, December 22, 2003, tech.tom.com/1121/2069/20031222-72485.html).

often met after FIEs send drawings or even personnel to offer technical guidance to domestic enterprises.

As noted earlier, FIEs have successfully collaborated with domestic enterprises and scientific research institutions to develop new technology. In fact, most Chinese partners have already been leading competitors in the local industry when they enter into a joint venture. For example, the Lenovo Group worked with Oracle to develop ERP software to meet the demands of small and medium-sized companies; the Langchao Group cooperated with LG to develop company-used Composite Solutions software; and TCL worked with French Alcatel to develop new mobile communication technologies. These collaborations not only developed new technologies for both also enhanced their respective competitiveness in the market. But more importantly, domestic enterprises developed their technological capabilities, and FIEs tapped into China's high-caliber scientific research institutions and employee pool and worked with them to conduct technological cooperation.

What about the human factor? The results of the survey I chaired (Long et al. 2003, 82) show that 85.4 percent of 442 enterprises engaged in the processing trade have trained their employees in China, 21.3 percent trained their employees abroad, and only 8.89 percent did not train any of their employees. Training was offered to managerial staff members, technical specialists, and ordinary workers as well. As these employees left FIEs to either start up or work for rival companies,[12] the training has contributed to the benefit of the entire society.

Foreign investment has also provided China's domestic enterprises with a manufacturing base from which to develop new products. This technological spillover has been particularly beneficial in certain regions. For example, ZTE Telecommunications Co. Ltd., an emerging telecommunications equipment manufacturer based in Shenzhen, has taken advantage of the Pearl River Delta region to develop and produce a huge quantity of highly competitive ITC products.

"Crowding Out" and "Spillover Effects"

Throughout the world, FDI's affects on host countries vary. Crowding out and technology spillover effects inevitably occur, however, and they are often compared.

In many developing countries, FDI generates crowding-out effects upon the host country's market, preventing domestic enterprises from developing. In China, FDI's crowding-out effects occur in two ways. First, FIEs

12. According to the same survey (Long et al. 2003), 90 percent of FIE-trained employees left to work for other organizations, with some senior management staff members and technological development specialists working for rival Chinese companies.

have easily recruited scientifically and technologically talented workers with higher wages. In the mid-1990s, this scenario was common since SOEs maintained rigid infrastructures and were unable to provide advancement opportunities or high wages for their employees.[13] Similarly, China's private domestic enterprises were just emerging and were equally unable to attract large numbers of talented employees.

However, changes began at the end of the 1990s. First, a large number of SOEs were restructured to meet current market requirements and aggressively recruited talented job seekers. Second, as Chinese private enterprises (e.g., Huawei, ZTE, TCL, etc.) have developed and become leading technology providers, they have attracted large numbers of extremely talented tech personnel. Third, as the Chinese market grows ever larger and is globally targeted, Chinese students who have studied abroad have returned home to either establish their own businesses or work in domestic enterprises. Consequently, domestic enterprises have increased their technological capabilities. Furthermore, these changes have significantly offset FDI's crowding-out effects.

Second, FDI's crowding-out effects in China occur because foreign investors restrict any technological development by their Chinese partners through their controlling interest in joint ventures. In fact, foreign investors' better understanding of intellectual property rights' (IPRs) importance gave them the upper hand when stipulating stronger control of IPRs under joint venture contracts.[14] Also, since most parent companies of FIEs controlled R&D and produced most of the goods from joint ventures, domestic investors in JVs were unable to establish independent R&D centers. China's automobile industry is a prime example of this crowding-out effect. In recent years, China's automobile industry has developed quickly. In 2003, the number of cars produced in China reached 2.069 million, up by 80.7 percent from the preceding year, and the number of cars sold amounted to 2.04 million, up by 92.8 percent from 2002. Unsurprisingly, all major worldwide automobile makers have established joint ventures in China. In these joint ventures, although foreign investors possess no more than 50 percent of the total share capital, they usually control developing technology so that domestic partners must obtain their approval for any technological improvements to existing car models. Therefore, some domestic private enterprises, after overcoming government restrictions, have entered the automobile industry with new car models they have developed without establishing JVs with foreign partners. Thus, despite MNCs' restrictions in joint ventures, overall, FDI's spillover effects in China's automobile industry have been positive.

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13. However, SOEs did provide such fringe benefits as medical insurance coverage, housing allowances, and retirement pensions, but well-educated young employees preferred a high salary.

14. Unsurprisingly, many domestic brands disappeared after these joint ventures broke up.

However, it is important to note the difference between China's automobile industry and others (e.g., the IT industry). Domestic automakers were restricted by overprotective government policy and their technological innovation abilities were also underdeveloped. The local market offered little or no motivation to compete. However, after China's membership in the WTO, many restrictions on the automobile industry were removed, import tariffs were drastically reduced, and a decrease in car prices has rapidly increased demand for cars. Thus, competition in the market has increased the quality and quantity of cars in China.

On the whole, FDI's spillover effects have appeared more eye-catching than its crowding-out effects. When comparing China's development with other developing nations across industries this is particularly apparent. Several factors affect this result. First, big market scale leaves enough growing space for domestic enterprises despite fierce competition from FIEs. In a small economy, big FIEs usually deprive the opportunities of domestic enterprises. Second, if the industrial foundation in the host country has been poorly developed, MNC considers the host country as nothing more than a production base and therefore rarely establishes links with domestic enterprises. The "enclave-featured economy" of FIEs limits "spillover effects." However, if the host country's industrial foundation is well developed, like China in recent years, FIEs are encouraged to purchase as many domestically made raw materials and spare parts as possible. Consequently, FIEs establish strong links and cooperate with domestic enterprises, which causes significant technology spillover. Third, competition between FIEs and domestic enterprises spurs technology spillover.

China's FDI policies of performance requirements have only introduced limited technology. China implemented a "swap market for technology" strategy, which essentially required foreign investors to "import" advanced technology in return for entering the domestic market. To return to the automobile industry as an example, China requires its foreign investors to operate in joint ventures with domestic automobile enterprises. These joint ventures, as noted earlier, require that FIEs own no more than 50 percent in total shares and that they transfer technology to their domestic partners. FIEs thus introduce new car models and manufacturing techniques from their parent companies, which are more advanced than those of their domestic partners. However, the "swap market for technology" strategy backfires since the government must control access to the domestic market—namely, by restricting other enterprises from entering the market. In order to do so, higher tariffs are imposed and nontariff barriers are erected to protect the domestic market, which essentially prohibits competition. Consequently, foreign investors are no longer motivated to pursue technological advances since lack of competition makes it unnecessary. For example, in 1985 when Volkswagen entered the domestic market through a joint venture, the VW Santana introduced more advanced technology than the domestically made

cars. This outdated and unimproved model continued to be produced by Shanghai Volkswagen.

As the automobile industry example illustrates, it is not enough to effect compulsory policies concerning introduction and transfer of technology. Equally important are policies that promote competition, IPR protection, and the like. Essentially, the entire domestic market must be developed in such a way that FIEs become an integral part of the economy.

Conclusion

China introduced foreign direct investment over 20 years ago and has progressively pursued foreign investment while adjusting its FDI policies. Since 1993, China has attracted the largest amount of FDI of all developing countries while increasing its levels of both exports and technological advancement.

To increase its level of exports, China has implemented compulsory, neutral, and voluntary FDI policies. Compulsory policies required that "FDI shall be able to keep a balance of exchanges, or make sure the proportion of their domestically made products in the total number of products reaches a certain benchmark, or a certain percentage of their products must be exported."[15] Interested foreign investors have to meet such requirements before receiving approval for investing in China. As China has ameliorated its balance of payments constantly, these compulsory requirements, have, in practice, played a decreasingly important role. In fact, authorities would rather pursue other policy-front objectives (such as ushering in technology). After China's membership in the WTO, the government eliminated most of these compulsory requirements to conform with the TRIMs Agreement. China has already attracted a huge amount of FDI and exports a high level of manufactured products. Simultaneously, China has implemented neutral (such as refunding of VAT for export) and voluntary policies (such as tax preference and trade facilitation) to promote exports. China's favorable FDI policies have apparently played an important role in improving the country's level of exports (as evident in the number of supporting survey results cited earlier). Like many other developing countries, China's major FDI policy objective is to introduce advanced technology. China's former compulsory FDI policies and a number of its voluntary policies have helped make this a reality with the added bonus of establishing a large number of R&D centers in the country as well. However, as a host country, China should pay close attention to technology spillover effects and less to crowding-out effects from FDI, particularly given its growing domestic market.

15. Laws on foreign direct investment in China.

Market competition is a much stronger force for sustaining technological advancement than FDI policies stipulating performance requirements. If we compare the progress of technology in an overprotected industry, such as the automobile industry, with a competitive one, it is evident that a number of supporting policies must exist beyond compulsory or voluntary FDI policies to advance technological progress. As China's automobile industry illustrates, the most important factor is to create a market climate that is conducive to full competition, since only competition will drive enterprises to embrace enduring technological advancement. As noted earlier, it is also necessary to create an environment that protects and encourages technological innovation by reinforcing the protection of IPRs as well as intensifying the effects of education and training.

It is also important to promote competition and links between FIEs and domestic enterprises so that FIEs blend seamlessly into the local economy and become an integral part of it. Simultaneously, domestic enterprises will constantly enhance their technological innovation capabilities.

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