
Made in China: From World Sweatshop to a Global Manufacturing Center?*

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Abstract

This paper argues that foreign investment is a second-best instrument that helps China to succeed in export-led growth by circumventing the many distortions that discriminate against domestic private enterprises. China's dependence on foreign investment for exports should decline as China builds up its market economy, but its generous preferences for foreign investors may unduly prolong its dependence. It is found that China's exports are increasingly dominated by the low value-added processing exports of foreign affiliates. In the case of Hong Kong investment in export processing on the Chinese mainland, the value-added in the Mainland is often less than that of re-exporting the output in Hong Kong. Since 2004, China has amended its treatment of foreign investments to attract higher-quality foreign investment and upgrade processing exports in order to transform itself from a world sweatshop to a global manufacturing center. The policies appear to have the intended effects.

I. Introduction

China's economic reform and opening since 1979 have led to rapid growth in foreign trade and investment that is widely regarded as a miracle. China's rank as an exporter rose from 24th in 1978 to 3rd in 2004. China surpassed the United States to become the world's number one recipient of Foreign Direct Investment (FDI) in 2002. The labor-intensive, export-oriented industries from Hong Kong (HK), Taiwan, South Korea, and elsewhere relocate to

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China in droves, and China has often been described as a “world factory.” The exports and inward FDI of the ASEAN and even Mexico have suffered from competition with China.

Although China’s export drive and economic development have been highly successful, and the contribution of foreign investment is undoubtedly substantial, Huang (2003) and Sung (2000, 2001) argued that China is *unduly* dependent on foreign investment for exports due to misconceived policies and market distortions in China’s transitional economy. For instance, foreign affiliates have an advantage over domestic firms because China’s administrative planning favored the least efficient firms, that is, state-owned enterprises (SOEs), and discriminated against efficient private enterprises. Foreign investment accounted for a high and rising share of China’s exports, rising to a record of 64 percent in 2005. Moreover, Sung (2000, 2001) showed that exports related to foreign investment tend to have a low domestic value-added content of 30 percent or so, because of transfer pricing, and also because foreign affiliates tend to source globally or from their overseas parents rather than locally.

It is well known that it is difficult for centrally planned economies to participate in world trade because of the many market distortions that can only be rectified gradually. This paper argues that, given such institutional distortions, foreign investment represents a second-best solution that allows China to participate in international specialization despite the many rigidities of China’s economy. For instance, China’s private enterprises can circumvent the systemic constraint in credit rationing through forming joint ventures with foreign partners.

Because the many distortions in China’s economy are transitional, the high dependence of China on foreign investment for exports should also be transitional. As China moves toward a market economy, the value of foreign investment as a second-best instrument to circumvent distortions would decline, and China should phase out the preferences given to foreign investors. This paper argues that the generous preferences China gives to foreign investors, especially those given by local governments in their intense competition for foreign investment, may unnecessarily prolong China’s dependence on foreign investment. Indeed, undue dependence on foreign investment has been a focus of national debate in China since 2005. China has taken significant policy changes to phase out preferences for foreign investment and also to foster indigenous innovation and technological capacity. From an analysis of 2006 data, the policy changes appear to be having the intended effect in lowering China’s dependence on foreign investment for exports.

The rest of the paper is organized as follows. Section 2 summarizes the arguments of Huang (2003) and Sung (2000, 2001) that China is unduly dependent on foreign investment. Section 3 describes China's export regime, especially the institutional features of processing exports. Section 4 focuses on the likely benefits and costs of export-oriented investment for China. Section 5 computes the rate of gross margin of export processing as a proxy for the rate of value-added. Section 6 compares the division of value-added between the Mainland (host of FDI) and HK (source of FDI) in splitting the supply chain in processing exports between the two. Section 7 analyzes the change in the rates of value-added in the Mainland and in Hong Kong. Section 8 examines the recent policy switch in China's regime of foreign trade and investment. Section 9 presents the conclusions of the analysis.

2. China's dependence on foreign investment

There have been increasing doubts on the economic efficiency and benefits of China's foreign trade and investment both in academic and policy circles. Yasheng Huang (2003) argued convincingly that China's inward FDI was unduly large due to two major weaknesses of the Chinese economy that constrained domestic firms rather than foreign firms. First, China's administrative planning favored the least efficient firms, that is, state-owned enterprises (SOEs), and discriminated against efficient private enterprises. Chinese firms were thus not competitive. Second, China's system led to a fragmentation of the national economy that constrained the growth of domestic firms rather than foreign firms. Through FDI, foreign firms could take advantage of business opportunities in China that were denied to domestic firms.

Sung (2000, 2001) showed that the rate of total value-added of China's processing exports, which were mostly related to foreign investment and also constituted the bulk of China's exports, was low (only 30 percent or so). Processing exports refer to schemes in China that allow the duty-free import of components and raw materials for use in export manufacturing. Such schemes were introduced formally in 1984 to offset the distortion on the cost of imported inputs due to China's high tariffs.

As HK accounted for the bulk of the foreign investment in export-processing in the Chinese mainland, Sung compared the income generated by such investment in HK with that generated in the Chinese mainland, and found that the former often exceeded the latter. From the point of view of the rate of value-added, a lot of what is classified as Mainland exports in international trade statistics should really be HK

exports. However, HK takes the lion's share of value-added while the Mainland takes the heat of U.S. protectionism.

Both Huang and Sung noted that Taiwan, HK, and South Korea had been able to develop labor-intensive exports through subcontracting arrangements without much need for inward FDI, unlike the case of the Chinese mainland (Huang 2003, p. 11; Sung 2000, p. 56). Both argued that, as a result of China's rigid system that hampers the operation of domestic enterprises, China was unduly dependent on foreign firms for investment in developing labor-intensive exports. Both noted that China's system of credit rationing, which discriminated against efficient private enterprises, exacerbated China's dependence on foreign investors (Huang 2003, p. 81; Sung 2000, p. 68).

Recently, the Chinese press and policymakers have been awakening to the shortcomings of China's foreign trade and investment regime. During the meeting of the National People's Congress (NPC) held in March 2005, China's undue dependency on foreign investment and technology was repeatedly discussed, and the case of DVD manufacturing was widely cited in the press. In the Chinese press, China is often depicted as a world sweatshop rather than a global manufacturing center.

Liu Chingfeng, a representative to the NPC, warned against China's dependency on FDI (*Beijing Daily*, 11 March 2005). He noted that although China produced 70 percent of the world's DVDs, a DVD set selling for US\$ 32 has to pay US\$ 18 in patent fees and US\$ 13 in costs, leaving only US\$ 1 as profit. Many Chinese DVD manufacturers have gone out of business, leaving an industry dominated by foreign investors. An MP3 set selling for US\$ 79 has to pay patent fees of US\$ 45 and costs of US\$ 32.50, leaving only US\$ 1.50 as profits. Liu concluded that Chinese manufacturing, which utilized the world's cheapest labor, was under "foreign technological exploitation." It was characterized by low efficiency and high levels of inputs, waste, and pollution.

3. China's export regime

Many tariff-ridden less-developed countries (LDCs) embarked on the path of export promotion by allowing the duty-free import of inputs used in export manufacturing to offset the distortion on the cost of imported inputs. In 1984, China instituted two such schemes, namely, "processing and assembling" (P&A), and "processing with imported materials" (PIM), which allowed the duty-free import of components and raw materials for use in export industries (Lardy 1994, p. 112). Exports under the two schemes are called *processing exports*. Detailed statistics on processing exports

and their imported inputs are available from China's Customs Statistics because their imported inputs are entitled to tariff exemption.

In P&A, a firm in China (which may be an indigenous firm or a foreign affiliate) processes raw materials or components supplied by a partner outside China for a processing fee. The outside partner owns the raw materials and processing outputs, and exports the outputs. PIM also involves the processing of imported materials and components for export. However, unlike P&A, firms in China (which may be indigenous firms or foreign affiliates) rather than those outside own the outputs and imported inputs. Instead of earning a processing fee, as they do in P&A, the firms involved sell the processing exports for a profit. In comparison with P&A, the firms undertaking PIM assume more risks as they own the outputs and imported inputs. However, as these firms are often foreign affiliates, the prices of inputs and outputs and the sourcing and marketing channels are frequently determined by the foreign parents. The distinction between the two schemes may be largely legal rather than substantive.

P&A represents an extreme form of dependence on foreign partners as most of the risks are on foreign investors. In contrast, firms in East Asian newly industrializing economies (NIEs) that undertake export processing bear more risks even at the early stage of export-oriented industrialization as they usually own their raw materials and outputs as in PIM.

In comparison with the usual case of subcontracting output to firms in East Asian NIEs, foreign partners in P&A usually undertake more tasks in the supply chain, leaving fewer tasks for the Chinese partners. For instance, besides providing the product design and marketing the output, which is common in subcontracting arrangements, the foreign partners in P&A usually have to provide the required materials, machinery, and technical assistance to their partners in China. The enhanced role of the foreign partner is attributable to the rigidity of China's system. For instance, China's state monopoly on imports and exports was only gradually decentralized in the reform era. It is still cumbersome for firms in China to import materials and machinery on their own. This implies a greater role for foreign partners, and a smaller role for Chinese firms. It is no accident that P&A exports have low value-added.

The foreign funds involved in P&A are classified as other foreign investment (OFI) rather than FDI. Unlike FDI, OFI does not confer legal control of the enterprise to the foreign investor. The Chinese partner legally controls the operation and usually pays for foreign machinery and technical assistance with labor services used in

making goods for the foreign partner. However, the distinction between the two types of investment is not sharp, because the foreign partner in P&A often has *de facto* (though not *de jure*) control.

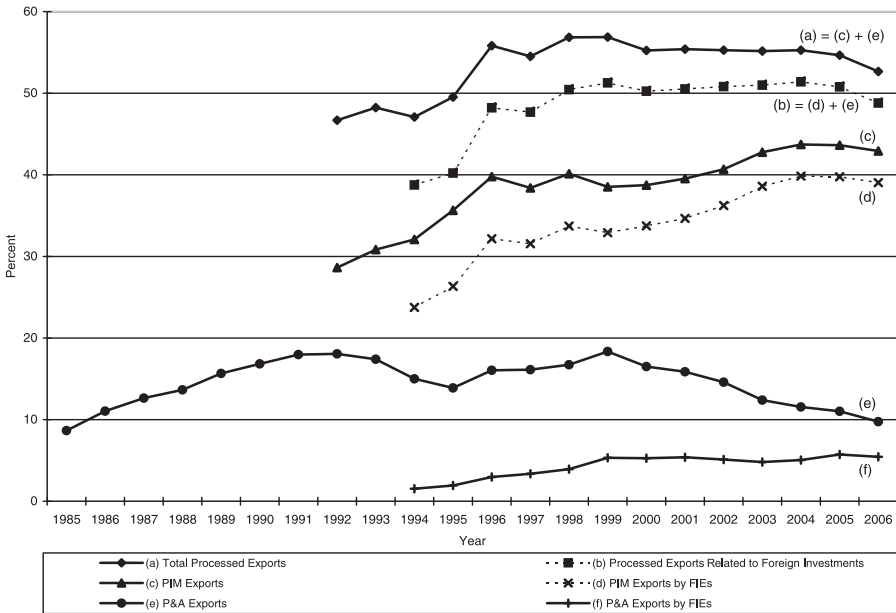
The share of P&A exports in China's total exports rose rapidly from a base of zero in 1978 (inauguration of China's open policy) to a peak of 18 percent in 1992. The share declined to 14 percent in 1995, but rebounded to another peak of 18.4 percent in 1999, before declining to 9.7 percent in 2006.

National data on PIM exports were not released until 1992. However, it is known that, in the late 1980s in Guangdong, which accounted for the bulk of China's processing exports, P&A exports vastly exceeded PIM exports (Sung 2001, p. 214). It is thus safe to conclude that P&A exports were the dominant form of processing exports in China in the 1980s. However, since the late 1980s, PIM exports have grown much faster than P&A exports in Guangdong. The same should be true for China as a whole. By 1992, when national data on PIM exports were first released, they were already 28.6 percent of national exports, exceeding the share of P&A exports by 10.6 percentage points. The rise of PIM exports relative to P&A exports probably reflects that, by the early 1990s, the development of China's market economy had gone far enough for firms in China to bear more risks. The share of PIM exports in China's exports rose to a peak of 43.7 percent in 2004, and declined marginally to 42.9 percent in 2006.

As will be seen subsequently, the value-added content of PIM exports are higher than those of P&A exports. However, the rise of PIM exports relative to P&A exports does not imply China is becoming less dependent on foreign investors in exports. On the contrary, the share of processing exports produced by foreign-invested enterprises (FIEs, or foreign affiliates) is high and rising. Figure 1 shows that, from 1994 to 2006, the share of P&A exports produced by FIEs rose from 10 percent to 56 percent, and the share of PIM exports produced by FIEs rose from 74 to 91 percent. For processing exports as a whole, the share produced by FIEs has risen from 54 percent to 85 percent during this period.

Processing exports have accounted for over half of China's total exports since 1996. This paper focuses on processing exports related to foreign investment (PERFI), which is defined to be PIM exports produced by FIEs plus all P&A exports (regardless of whether they are produced by FIEs or by domestic enterprises). This is because P&A represents an extreme form of dependence on foreign partners, who provide equipment and technical assistance in addition to raw materials and design

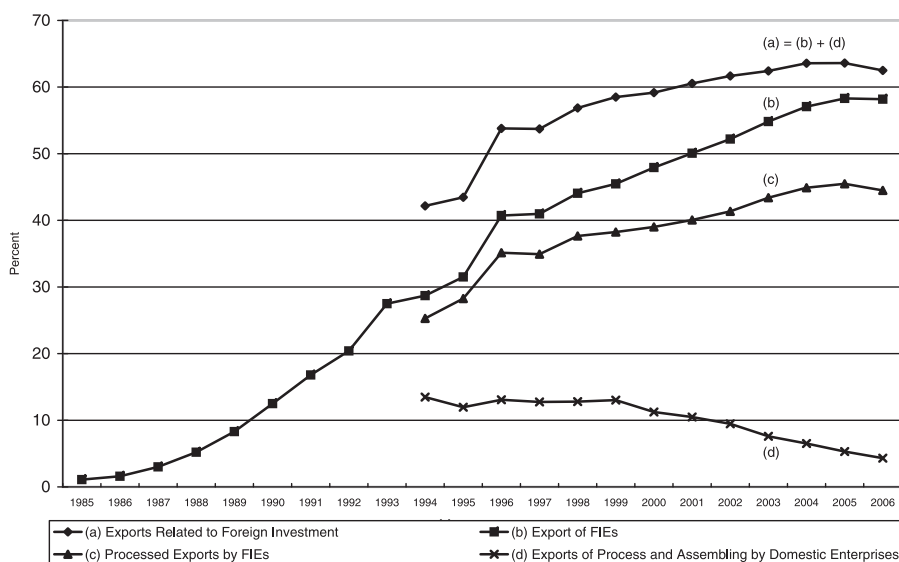
Figure 1. China's processed exports and that generated from foreign investments
(% of China's total exports)



specifications. PERFI have accounted for over half of China's exports since 1998 (Figure 1).

Figure 2 shows the share of China's exports produced by FIEs. The share has risen from 1 percent in 1985 to a peak of 58 percent in 2005. Although the bulk of exports of FIEs are processing exports, the share of processing exports in exports of FIEs has declined from 88 percent in 1994 to 78 percent in 2005. With the development of China's market economy, there is less need to rely on tariff-exempt schemes for two reasons. First, China's tariffs have been gradually slashed. Second, FIEs may have been able to source more inputs locally.

Figure 2 also shows the share of China's exports related to foreign investment, which includes exports of FIEs, and also P&A exports by domestic enterprises (P&A exports by FIEs are already included in exports of FIEs). The share of China's exports related to foreign investment rose from 42 percent in 1994 to a peak of 64 percent in 2005.

Figure 2. Share of China's exports related to foreign investment

4. Benefits and costs of export-oriented foreign investment

Export-oriented FDI has received considerable attention in the trade and development literature as it has been important in the growth of many LDCs. Helleiner's (1973) classic article distinguished between short-run allocative effects and long-run growth effects of export-oriented FDI.

Despite low value-added, the short-run allocative effects of export-oriented FDI for China have usually been positive as such FDI has created millions of jobs for surplus labor that have a low opportunity cost. The long run growth effects are mixed. Helleiner discussed "linkage," "learning," and "dependence" effects. Linkage and learning effects are normally positive, but dependence effects can be worrisome, as China's emerging private enterprises have to face an arena dominated by large FIEs. The benefits and costs of export-oriented FDI are discussed in detail herein.

4.1 Benefits of export-oriented foreign investment in a transitional economy

It must be stressed that, in itself, the surprisingly large share of China's exports arising from foreign investment may not imply that China is over-dependent on FDI, or that China's foreign investment regime is inefficient. Due to globalization, the global

Table 1. Share of foreign affiliates in total exports of East Asian host countries (percent)

Host country	Primary sector	Secondary sector			Tertiary sector	
		Electrical/electronic products	Chemical products	Motor vehicles		
Hong Kong (1984)	—	—	—	—	16.5	—
South Korea (1978)	—	—	—	—	24.6	—
Taiwan (1986)	18.5	43.6	30.8	—	18.5	3.6
Singapore (1988)	—	—	—	—	86.0	—
Malaysia (1986)	32.6	—	—	—	51.2	15.9
Philippines (1983)	—	—	—	—	51.5	—
Thailand (1980)	—	—	—	—	37.3	—

Source: UINTCMD (1992), Table Annex 9.

Note: Year in parentheses refers to year of data.

coordination of the supply chain in low-tech, labor-intensive products often requires specialized skills in supply chain management. The development of globalized production implies that “late industrializers” would be more dependent on foreign investment than “early industrializers” such as HK and Taiwan. Table 1 shows the share of foreign affiliates in the total exports in selected East Asian economies. The “late industrializers” (Malaysia, Philippines, and Thailand) were more dependent on foreign investment than the “early industrializers” (HK, Taiwan, and South Korea). As China’s open-door policy came only in 1978, the high share of FIEs in China’s exports seems to fit the East Asian pattern.

Besides the late opening of the Chinese economy, China’s dependence on foreign investment can be seen as a temporary second best means to enable China to circumvent the many rigidities of its transitional economy in order to reap the benefits of export-oriented growth. For instance, even though the state monopoly in foreign trade has been gradually diluted and the power to trade has also been gradually decentralized, getting approval can still be cumbersome. Restrictions on foreign travel and red-tape in obtaining a passport hamper the chance of indigenous entrepreneurs to obtain orders from foreign buyers. China’s foreign exchange control also acts as a barrier to organizing overseas road shows and exhibitions.

Although an FIE can get around the above institutional constraints, foreign ownership was still ideologically suspect in the early days of the reform era; for example, wholly foreign-owned enterprises were seldom approved before 1987 (Naughton 1997, pp. 91–92). Given such considerations, the popularity of P&A in the early stage of the reform era is understandable. Under P&A, it is possible to avoid foreign ownership.¹ The foreign partner bears most of the risks and performs most of the value-

¹ In the early reform era, P&A arrangements mostly involved foreign partners subcontracting output to indigenous Chinese enterprises instead of FIEs in China.

adding activities in the production chain while leaving the labor-intensive processing to the Chinese enterprise. As mentioned before, P&A represents an extreme form of dependence on the foreign investor.

With China's liberalization on FDI in 1987, especially on wholly foreign-owned enterprises, FDI rose rapidly,² and dominated both P&A exports and PIM exports. PIM exports also grew faster than P&A exports, and exceeded the latter by 1991 or 1992. Foreign investment has helped China to reap the benefits of export-oriented growth despite the rigidities of its transitional economy. Though China's processing exports related to foreign investment have low value-added, FIEs can be highly competitive as they have access to global export and sourcing networks. Whereas domestic firms have better access to domestic suppliers, they tend to be inefficient due to protection. In fact, globalized, cross-border production implies that the rate of value-added in any one country would tend to be low as the production chain is shared among many countries. With the help of an efficient, globalized production network of foreign investors, China's exports have grown at astounding rates, and the total value-added generated can be large despite a low rate of value-added.

In comparison with India, China is more open to foreign investment, and there is strong evidence that foreign investors have helped China greatly in the competition with India for export markets. For example, in the early 1980s, India and China had identical shares of world exports of clothing, at 3.95 percent. By the end of the 1990s, China's share soared to 20.5 percent, whereas that of India was only 5.3 percent.

With the help of foreign investors, China has surpassed India in exporting jewelry, in which India has world-renowned craftsmanship. By the end of the 1990s, China's share of world jewelry exports rose to 9.48 percent, whereas India's was only 4.61 percent. The relocation of HK's jewelry industry to Guangdong has been a decisive factor.

In 1978, the inaugural year of China's open-door policy, China's export-GDP ratio was only 4.6 percent, which was less than India's 5.6 percent. By 2005, China's ratio soared to 34 percent, vastly exceeding India's 12 percent. Though the rate of value-added of China's processing exports is low, the scale of these exports means that the total value-added and employment generated is substantial. At the end of 2001, HK investors reportedly employed over 10 million workers in Guangdong (Sung 2005,

² There was slow growth from 1989–1991 due to the 1989 Tiananmen Incident. However, the Tiananmen Incident affected mostly FDI from the West geared toward the domestic market rather than the labor-intensive, export-oriented projects from HK and Taiwan.

p. 9). As China has huge reserves of surplus labor with little opportunity costs, the allocative effect of export-oriented investment in China should be highly positive in most cases.

4.2 Costs of export-oriented FDI

Although import-substituting FDI may lead to immiserization due to tariff protection, export-oriented FDI seldom results in *value subtraction*, namely, negative value-added (at international prices) as the outputs are sold in the world market and most of the inputs are imported at international prices (Helleiner 1973, p. 14). However, Helleiner cautioned that it is possible for the costs of government-provided infrastructure to exceed the benefits in the competition for “foot-loose” industries among host countries, which have little bargaining power.

For the Chinese case, value subtraction is possible. China’s special economic zones have financial assistance from the state for infrastructure, often in the form of low-interest loans. Energy prices are still artificially low in China. Moreover, in addition to the international competition for foreign investment mentioned by Helleiner, China’s local governments also compete fiercely for foreign investment because local officials are promoted on their performance in attracting foreign investment. Not surprisingly, local officials have given concessions to foreign investors exceeding the limits allowed by national policy. Some of these concessions (sometimes called “super-national treatment”) can lead to substantial social losses. For instance, local officials in the Yangzi Delta have granted large tracts of free land to foreign investors. As the Yangzi Delta is a densely populated region, the opportunity cost of land can be extremely high.

Export-oriented foreign investment can generate substantial negative externalities. China’s local governments have often violated national environmental standards in their fierce competition for foreign investment. Environmental degradation is a severe problem in the Pearl River Delta, which is the cradle of China’s export drive. Although Guangdong has lately banned high polluting industries, it should be noted that most manufacturing activities have some negative environmental effects in terms of noise and emissions generation. If the rate of value-added is low, as is the case in processing exports, the negative externality does not have to be large to lead to welfare loss.

The rapid growth of China’s exports has triggered protectionism in overseas markets. This can also be regarded as a negative externality. Although this negative externality applies to all Chinese exports, it is of particular concern for low value-added processing exports for two reasons. First, trade flows are measured in terms

of gross value rather than value-added. The low value-added exports of China exaggerate the magnitude of China's bilateral trade imbalances, which drive protectionist sentiments against China. For instance, while the 2005 U.S.–China bilateral trade deficit in U.S. statistics (measured in gross value of trade) was US\$ 201.6 billion, the deficit measured in domestic value-added would only be US\$ 30.6 billion (Lau et al. 2006). Protectionist sentiments have led to trade barriers against China's processing exports as well as non-processing exports, which have higher value-added.

Second, in the case of HK's investment in processing exports in the mainland, the rate of value-added in HK is often higher than that in the mainland. The higher "take" of HK relative to the mainland implies that much of what are regarded as the mainland's exports are in fact HK exports, if value-added rather than assembling or fabrication is used to determine country of origin. The mainland takes the heat of U.S. trade protectionism, while HK captures the lion's share of the benefits. China's low value-added processing exports have generated a significant negative externality for China in its relationship with the United States.

Besides these considerations on allocative effects, there are also causes for concern in long-run growth. As China's institutional rigidities are transitional, its high dependence on foreign investment for exports should also be transitional. However, there is the danger that the dominating position of FIEs may be entrenched, and China's emerging private enterprises may face an arena dominated by FIEs. The transitional nature of China's economy also implies that China should phase out its many preferences for foreign investors during its transition to a market economy. Although China has phased out some preferences for foreign investors, the existing preferences are still strong.

China's preferential treatment of foreign investors (and discrimination against domestic enterprises) is so strong that many Chinese enterprises take advantage of the preferential treatment by disguising themselves as foreign investors: they establish overseas subsidiaries to invest back in China. The World Bank estimated that this "round-tripping" of Chinese capital is substantial, accounting for 25 percent of the total inward FDI in China in 1992 (Huang 2003, p. 38).

Although the magnitude of round-tripping is difficult to estimate, there is no sign that the activity has dampened in recent years. One proxy of round-tripping is the share of the "tax haven economies" (Bermuda, British Virgin Islands, etc.) in China's outward/inward FDI. The share in China's outward FDI has risen from 31 percent in 2004 to 53 percent in 2005. For inward FDI, the share has risen from 0.2 percent in 1991 to over 20 percent in 2005.

Round-tripping of Chinese capital neither brings new technology nor additional capital to China. It may benefit China as it enables domestic capital to circumvent institutional constraints. However, the benefits must be weighed against losses in tax revenue and other distortions that round-tripping may generate.

Undue dependence on foreign investment may have hampered the development of indigenous firms. In the *Forbes* list of “exciting new firms” in 2002, there were 13 from India but none from the Chinese mainland. In the 2003 list, there were 13 from India but only 1 from the Chinese mainland.

5. The rate of value-added of processing exports related to foreign investment

This paper focuses on the analysis of rate of value-added of processing exports to examine the economic benefits for China of export-oriented foreign investment. As mentioned before, a low rate of value-added may not imply that the activity involved is economically inefficient. In the age of globalization, fragmentation of the production process across national borders is efficient, and often implies a low rate of value-added in any one country.

Although the rate of value-added (or change in the rate over time) is a crude indicator of economic benefits, there are many advantages of focusing on the rate of value-added. First, in the case of China’s processing exports, value-added is a good proxy of net benefits because such exports usually employ surplus labor with little alternative use. Second, a low rate of value-added implies that the gross value of exports would vastly overstate the size of benefits to China. Third, a rise in the rate of value-added over time usually indicates increasing forward and backward linkages, whereas stagnation of the rate over a long period may be a cause of concern.

Finally, given fragmentation of the production process, focusing on the rate of value-added in a particular step in the production chain (for processing exports, this is usually the assembly stage) is often more revealing than looking at the technology content of the final product. Quite a few studies have shown that the commodity composition of China’s exports has shifted from simple products such as clothing to high-tech products such as DVDs, and concluded that China has been successful in climbing up the technological ladder.³ These studies are misleading. Although DVDs are indeed a high-tech product, the assembly of DVD sets from imported

³ For example, see Zhang (2006), which is a study of the Development Research Center of China’s State Council.

components is a low-tech activity, which is reflected in the low rate of value-added of these processing exports.

As a measure of economic benefits, total value-added is better than direct value-added. Increasing forward or backward linkage would show up in total value-added instead of direct value-added. Unfortunately, the computation of total value-added requires an input–output table, which is very data intensive. The analysis of change in the rate of total value-added over time would involve the use of many input–output tables.

Fortunately, the rate of gross margin (RGM) of export processing (the percentage by which the value of processing exports exceeds the value of imported inputs, using the former as the base)⁴ is a good proxy for the rate of total value-added. As *China Customs Statistics* contain data on imports of raw materials and components used in processing exports, the computation of the RGM of processing exports is straightforward.

Our computation assumes that imported inputs in a given year are all used to produce goods exported in that year. In actual fact, processing takes time, and there is some lag time between imports and exports. When export processing is growing rapidly, the above method of computation will understate the gross margin, as the value of imported inputs in a given year will overstate the amount of inputs actually used to produce exports in that year. However, the problem is not very serious, as the production cycle for labor-intensive processing is quite short (a couple of months or so).

Conceptually, the gross margin of PERFI overstates total value-added or income generated in the Mainland for two reasons. First, besides importing raw materials, processing operations may import services (often from HK). Second, the domestically produced inputs used in export processing may also use imported inputs (e.g., the electricity used in export processing may need imported oil), and the indirect use of imported inputs represent a leakage that should be deducted. Deducting

⁴ $RGM = (X - M)/X$, where X and M represent values of exports and imported inputs used in export production, respectively. It is possible to use M (instead of X) as the base, and the rate thus defined would be monotonic with ours (except when X is negative, which is not empirically relevant), giving similar results. We choose X as the base in order to compare the value-added generated per dollar of processing exports, X , in the mainland (host of FDI) with that in HK (source of FDI). It will be seen later that, in the definition of rate of value-added for Hong Kong, X is also used as the base to facilitate comparison.

Table 2. Rate of gross margin of China's processing exports (percent)

	Processing exports							
	Processing with imported materials			Processing and assembly			Related to foreign investment	Overall
	Domestic enterprises	FIEs	All enterprises	Domestic enterprises	FIEs	All enterprises		
1994	38.9	8.4	16.4	18.1	4.6	16.7	11.6	16.5
1995	44.2	12.2	20.6	23.8	7.2	21.5	15.4	20.8
1996	41.6	22.3	26.0	28.8	16.7	26.6	23.7	26.2
1997	48.5	25.6	29.7	30.9	22.1	29.1	26.8	29.5
1998	53.4	30.3	34.0	36.9	30.2	35.3	31.9	34.4
1999	56.6	29.4	33.4	36.3	28.8	34.1	31.1	33.6
2000	54.3	30.0	33.1	34.5	26.5	32.0	30.6	32.8
2001	57.0	35.5	38.1	35.1	25.0	31.7	34.3	36.3
2002	55.1	30.9	33.5	30.1	24.1	28.0	30.1	32.1
2003	55.7	31.6	34.0	30.7	23.7	28.0	30.7	32.6
2004	52.3	33.6	35.2	29.9	11.1	21.7	30.9	32.4
2005	52.7	36.3	37.7	28.5	12.5	20.2	32.8	34.2
2006	55.9	38.9	40.5	26.8	18.0	21.9	35.5	37.0
Average	51.2	28.1	31.7	30.0	19.3	26.7	28.1	30.6

Sources: China Customs Statistics, *China Customs Administration various issues*.

these two items would give domestic value added or GDP generated. To obtain GNP generated for the Mainland, we need to deduct a third item, namely, the profits of PERFI that belong to the foreign investor. The gross margin of PERFI thus gives an upper bound of the GNP generated for the Mainland.

5.1 RGM of export processing

Table 2 shows the RGM of China's processing exports since 1994. Two observations are in order. First, the rates of gross margin of domestic enterprises in both PIM and P&A are substantially higher than those of FIEs. This is expected because domestic enterprises tend to source locally whereas FIEs tend to source globally. Second, the rates of gross margin of PIM for both domestic enterprises and FIEs are higher than those of P&A. This is again expected because firms involved in PIM owned their inputs and outputs and bear more risks. The rates shows an increasing trend, especially in the late 1990s. The changes in the rates will be analyzed later.

There have been two input-output studies of the rate of value-added of China's exports that distinguished between processing and non-processing exports. Table 3 compares the RGM of processing exports with the rate of total value-added in 1995 and 2005, the base year of the two studies. Four observations are in order. First, the RGM of processing exports overstates the rate of value-added slightly by around 3 percentage points in both 1995 and 2005. This shows that RGM is a good proxy for the rate of total value-added. Second, the rates of value-added for non-processing exports are much higher than those of processing exports. Third, the rates of value-

Table 3. Rates of gross margin / value-added of China's processing and non-processing exports (percent)

	Processing exports			Other exports		All exports	
	DVA	TVA	RGM	DVA	TVA	DVA	TVA
1995	15.3	17.6	20.8	32.9	92.5	24.0	54.5
2005	16.6	28.7	32.1	24.0	63.3	20.4	46.6

Sources: 1995 and 2005 data are taken from Chen et al. (2005) and Lau et al. (in press), respectively.

Notes: DVD = Rate of direct value-added; TVA = Rate of total value-added; RGM = Rate of gross margin.

Table 4. Processed exports by FIEs and domestic enterprises (US\$ million)

	FIEs	Domestic enterprises				Total
		Subtotal	SOEs	CE	Other	
1994	30,598 (53.7)	26,373 (46.3)	25,886 (45.4)	560 (1.0)	12 (0.02)	56,980 (100)
2006	431,159 (84.5) <24.7>	79,216 (15.5) <9.6>	51,424 (10.0) <5.9>	10,092 (2.0) <27.3>	17,670 (3.5) <83.7>	510,375 (100) <20.1>

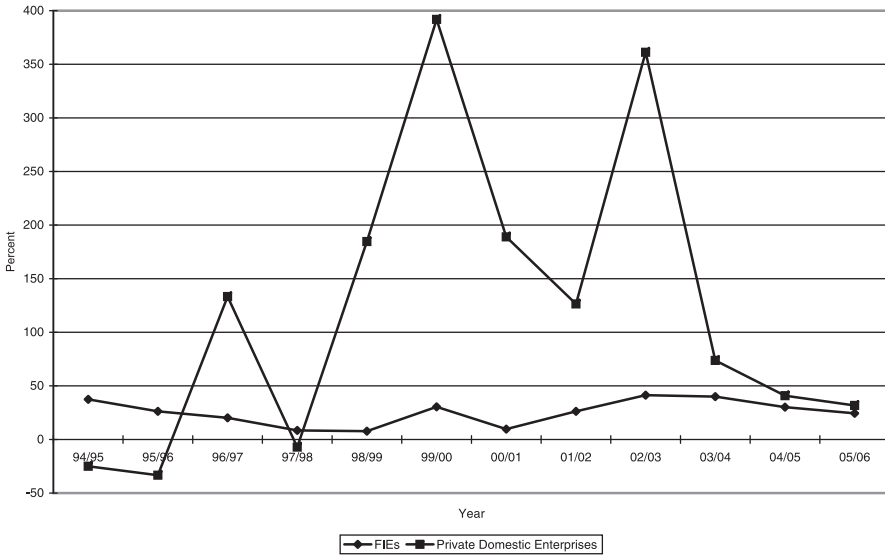
Sources: China Customs Statistics, various issues.

Notes: Figures in parentheses represent percentage share of total, figures in angle brackets represent average annual growth rate from 1994 to 2006.

added of the two groups of exports have partially converged. This is expected because China has slashed its tariffs and liberalized imports. As a result, non-processing exports would also use more imported inputs. Fourth, due to the large share of processing exports in total exports, the rate of total value-added of China's exports is quite low, around 47 percent in 2002.

While the RGM of the processing exports of FIEs is much less than that of domestic enterprises, the processing exports of FIEs have grown much faster than that of domestic enterprises, with the result that China's processing exports are increasingly dominated by the low value-added exports of FIEs. Table 4 compares processing exports from FIEs and domestic enterprises. From 1994 to 2006, the average annual rate of growth of processing exports from FIEs was 24.7 percent, whereas that for domestic enterprises was only 9.6 percent. Among domestic enterprises, state-owned enterprises (SOEs) have performed badly while collective enterprises and "other enterprises" (mostly private enterprises) have performed extremely well. However, because SOEs have a dominating position among domestic enterprises, and the share of private enterprises was negligible, the hyper-growth of exports from exports from private enterprises (averaging 84 percent a year) was unable to reverse the weak performance for domestic enterprises as a whole. The share of FIEs

Figure 3. Year-on-year growth rate of processed exports of FIEs and private domestic enterprises



in processing exports rose from 54 percent in 1994 to 84.5 percent in 2006, and the share of domestic enterprises fell correspondingly.

Though the average rate of growth of processing exports of private enterprises is much higher than that of FIEs, the picture is misleading because private enterprises started from a very small base. Moreover, the growth of exports of private enterprises is greatly exaggerated by the conversion of SOEs and collective enterprises into private enterprises. It is more meaningful to look at the total processing exports of all domestic enterprises.

Figure 3 compares the year-on-year (YOY) growth rate of the processing exports of private enterprises with that of FIEs. The YOY growth of the processed exports of private enterprises has fluctuated greatly (from -33 percent to over 390 percent), reflecting the small base and the conversion of SOEs to private enterprises. Since 2004, the YOY growth rate of exports of private enterprises has slowed down greatly, converging to that of FIEs. Despite many years of hyper-growth, the processing exports of private enterprises were only 4 percent of that of FIEs in 2006. It

would be difficult for the emerging private enterprises of China to challenge the dominance of FIEs, which are established and more technologically advanced.

6. Income generated for HK and for the Mainland

It is well known that HK is the number one investor in the Chinese Mainland. HK accounted for 41 percent of the cumulative inward FDI in the Mainland from 1979 to 2006. HK's share in export-oriented FDI is likely to be even higher as HK tends to invest in labor-intensive export-oriented projects in the Mainland whereas the United States and Japan have concentrated their investments on large-scale import-competing projects.

HK's investment in export-processing activities in the Mainland has generated huge trade flows between the Mainland and HK. In such investment, the Mainland partners of HK firms process raw materials and semi-manufacturers supplied by the HK parent, and the processing output is sold via the parent to the world market, usually in the form of HK imports from the Mainland for re-exports to third economies. Such trade is called outward-processing (OP) trade in HK. OP accounted for around 80 percent or more of HK's re-exports of Mainland origin since 1993 (Sung 2005, pp. 89–90).

In re-exporting, HK adds value to the goods exported by other economies to HK for re-export. Table 5 shows the RGMs of HK's re-exports (the percentage by which the value of HK's re-exports exceed the value of HK's imports for re-exports,⁵ using the latter as the base). The RGM is much higher for re-exports of Mainland goods than for re-exports of other goods. This is because the bulk of HK's re-exports of Mainland goods involve OP, and HK investors engage in many value-adding activities in OP.

The RGM of re-exports of Mainland goods rose from 13 percent in 1989 to a record 40 percent in 2000, but declined to 31 percent in 2005. HK's re-exports of Mainland goods include products related to OP as well as "pure re-exports" that do not involve OP. The RGM of the former should exceed the latter because OP involves many value-adding activities provided by the HK investors. The increase in the

⁵ It should be noted that, in this paper, HK's imports from the Mainland for re-exports are taken to be the same as Mainland's exports to HK because the cost, insurance, freight (c.o.b.) minus freight on board (f.o.b.) differential is negligible (only 1 percent). We use the value of Mainland's exports as the base in the calculation of the RGM of Mainland's exports and also the RGM of HK's re-exports of Mainland goods in order to facilitate comparison of the value-added generated for the Mainland and for HK.

Table 5. Rates of gross margin (RGM) of Hong Kong's re-exports, offshore exports, and outward-processing in the mainland (percent)

Year	HK's re-exports		HK's offshore exports ^a		HK's outward processing ^b		
	Mainland origin	Others	Mainland origin	To Mainland	Re-exports via HK	Offshore exports	Over all
1989	13.0	11.5	—	—	—	—	—
1990	21.1	12.7	—	—	—	—	—
1991	25.8	10.3	—	—	30.1	—	—
1992	29.7	10.3	—	—	34.0	—	—
1993	35.3	8.5	—	—	38.9	—	—
1994	33.2	6.0	—	—	35.8	—	—
1995	32.8	5.9	—	—	35.6	—	—
1996	34.4	6.6	—	—	37.3	—	—
1997	34.6	7.4	—	—	37.9	—	—
1998	35.1	8.6	—	—	38.8	—	—
1999	38.3	9.6	—	—	42.9	—	—
2000	39.9	10.5	16.3	7.9	45.4	23.6	39.9
2001	37.0	10.6	12.8	9.2	42.6	19.4	35.4
2002	34.2	11.9	12.1	9.1	40.8	17.9	32.7
2003	31.4	9.9	12.4	8.3	37.9	18.7	30.9
2004	30.7	8.8	12.1	8.7	36.8	17.4	28.8
2005	30.7	8.5	11.3	7.7	36.0	16.3	28.4
Average	31.6	9.3	12.8	8.5	38.1	18.9	32.7

Sources: RGM of re-exports are provided by the Census and Statistics Department of the Hong Kong Government. RGM of offshore exports are taken from Report on Hong Kong Trade in Services Statistics, Census and Statistics Department of Hong Kong, various issues.

Notes: a. Offshore export involved goods purchased from the Mainland by an HK firm for export to another party outside HK. The goods involved do not enter and leave HK.

b. HK's outward processing in the Mainland refers to the provision of raw materials and semi-manufactures by an HK firm to a mainland firm for processing with a contractual arrangement for subsequent export of the processed product from the Mainland to HK or to a party outside HK.

RGM of re-exports of Mainland goods from 1989 to 2000 is largely due to the rise in the share of products related to OP, which rose from 74.1 percent in 1991 to 88.4 percent in 1997 (Sung 2005, Table 4.6). The decline in the RGM of re-exports of Mainland goods after 2000 is largely due to the substitution of local inputs for HK inputs, as will be detailed later.

We do not have data on the RGMs of the two separate categories re-exports of Mainland goods (those involving OP and pure re-exports). The gross margin of re-exports of Mainland goods would understate the gross margin of re-exports involving OP. In the absence of better data, we take the former as a proxy for the latter. The bias should not be too serious as the bulk of HK's re-exports of Mainland goods involves OP.

Before the mid 1990s, over 80 percent of China's PERFI were re-exported via HK (Sung 2000, p. 213). The share has since declined, to 47 percent in 2000, and to only 17 percent in 2005. The decline is largely due to two factors. First, China's export-oriented industrialization, which started in Guangdong with HK investors, spread

north along the coast, and PERFI outside of Guangdong are usually not shipped via HK. Although some HK investors have gone north, most of the export-oriented investment outside of Guangdong came from other countries such as Taiwan, Japan, and South Korea. Second, China has modernized its port facilities in Guangdong since the mid 1990s, and the exports of HK firms in Guangdong have been increasingly diverted to local ports, though the trade is still handled mostly by HK firms. In HK, this is called offshore trade—that is, trade that bypasses the HK port but is still handled by HK firms. The RGM of HK's offshore exports is less than that of HK's re-exports (Table 5). This is expected as offshore trade involves less value-adding activities in HK.

It should be stressed that the bulk of Guangdong's processing exports are still intermediated by HK. In 2005, HK's OP in the Mainland re-exported via HK and handled as HK's offshore exports were, respectively, 42 percent and 27 percent of Guangdong's processing exports, or a total of 69 percent of Guangdong's exports were intermediated by HK.

With relocation of HK manufacturing to the Mainland, part of the supply chain, mostly assembly and related operations, are performed in the Mainland, while the financing and trading operations are usually done in HK. It is instructive to compare the division of value-added between the Mainland (host of FDI) and HK (source of FDI) in producing processing exports. To do this, we compare the RGM of Mainland's PERFI with the RGM of HK's OP, which is defined to be the gross margin generated in HK per dollar of Mainland's PERFI.

Although the bulk of HK's OP in the Mainland is still re-exported through HK, an increasing portion takes the form of offshore trade. From 2000 to 2005, the share of HK's OP taking the form of offshore exports rose from 25 percent to 41 percent. The RGM of HK's OP is a weighted average of the RGMs of OP handled through two alternative channels: as HK's re-exports, or as HK's offshore exports. The weights are the shares of exports through the respective channels.⁶ The method of estimation is now detailed.

⁶ Algebraically,

$$\text{RgmOp} = \text{ShOpRe} \times \text{RgmOpRe} + \text{ShOpOff} \times \text{RgmOpOff},$$

where

ShOpRe is the share of HK's OP in the Mainland re-exported through HK,
RgmOpRe is the RGM of HK's OP in the Mainland re-exported through HK,
ShOpOff is the share of HK's OP in the Mainland handled as HK's offshore trade, and
RgmOpOff is the RGM of HK's OP in the Mainland handled as HK's offshore trade.

The RGM of HK's OP re-exported via HK is the sum of two terms. The first term is the RGM of re-exports of Mainland goods. The second term arises from re-exports of non-Mainland goods (materials and semi-manufactures) by HK investors to the Mainland for OP, as HK investors also earn re-export margin from the activity. The second term is the product of two factors. The first factor is the RGM of HK's re-exports of third-country goods to the Mainland. The second factor is *HK's re-exports of third-country goods to the Mainland for OP per dollar of Mainland's processing exports re-exported by HK involving OP*.⁷ The factor is obtained from HK statistics on re-exports involving OP (Sung 2005, pp. 89–90). In 2005, this ratio is 0.62, namely, one dollar of Mainland's processing exports re-exported by HK involving OP requires 62 cents of HK's re-exports of third-country goods.

The estimation of the RGM of HK's OP handled as offshore exports is analogous to that of OP re-exported via HK.⁸ The RGM of HK's OP is computed from the weighted average of the two RGMs of OP through the two channels (Table 5). The RGM of HK's OP re-exported via HK rose from 30 percent in 1991 to a peak of 45 percent in 2000, but then declined to 36 percent in 2005. For the RGM of HK's OP taking the form of offshore exports, data are only available since 2000. From 2000 to 2005, the overall RGM of HK's OP has declined sharply in 5 years (from 39.9 percent to 28.4 percent), for two reasons. First, re-exports via HK are increasingly diverted to offshore exports bypassing HK, and the latter has a lower RGM. Second, the RGMs of HK's OP through both channels have declined, reflecting more value-added in the Mainland and less value-added in HK for each channel.

Before 2000, there are no data to estimate the overall RGM, but we can just use the RGM of OP re-exported via HK as a proxy. Although the proxy is biased upward,

⁷ Algebraically,

$$RgmOpRe = RgmReMd + RgmReTh (ReThOp/ReMdOp),$$

where

RgmOpRe is the RGM of HK's OP re-exported via HK,
RgmReMd is the RGM of HK's re-exports of Mainland goods,
RgmReTh is the RGM of HK's re-exports of third country goods to the Mainland,
ReThOp is HK's re-exports of third-country goods to the Mainland for OP, and
ReMdOp is HK's re-exports of Mainland goods involving OP.

⁸ The RGM is the sum of two terms. The first term is the RGM of HK's offshore export of Mainland goods. The second term, which arises from offshore exports of non-Mainland goods by HK firms to the Mainland for OP, is the product of two factors. The first factor is the RGM of HK's offshore export of non-Mainland goods to the Mainland. The second factor is *HK's offshore export of non-Mainland goods to the Mainland for OP per dollar of HK's offshore export of Mainland goods from OP*.

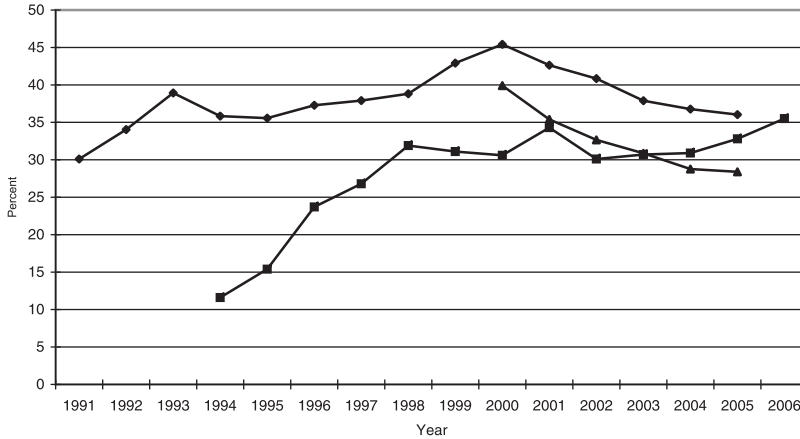
the bias should not be too serious as offshore exports were less significant before 2000.

Strictly speaking, the RGM of HK's OP should include the profits of HK's affiliates in the Mainland in addition to the RGMs of re-exports and offshore exports. However, these affiliates do not usually report significant profits because they book their profits in HK through transfer pricing. Though the relevant tax rates in HK and the Chinese mainland are similar, there is a significant incentive for transfer pricing, as HK has no foreign exchange controls and has better protection of property rights. Funds can be used more flexibly in HK than the Mainland. The standard way of transfer pricing is to overstate the price of inputs supplied by the parent firm to its subsidiary (which inflates the RGM of HK's re-exports, or offshore exports, of third-country goods to the Mainland), and understate the price of outputs sold by the subsidiary to its parent (which inflates HK's RGM of re-exports, or offshore exports, of Mainland goods). The greater part of the profit should be captured in the RGMs of re-exports or offshore exports. Our estimation of the RGM of HK's OP should be quite accurate.

The RGM of HK's OP overstates the rate of total value-added generated by OP in HK slightly because the domestically produced inputs used in re-exporting and offshore exports may require imported inputs, and the indirect use of imported inputs represent a leakage that should be deducted. The rate of leakage for each year from 1991 to 2004 is known from an input-output study of HK trade (Sung 2006), and the rate was no more than 7 percent because trading services use few intermediate inputs. This means that the RGM of OP is a good proxy for the rate of total value-added as the rate of total value-added is only slightly less than the RGM.

Although the RGM of HK's OP in the Mainland is high, it is still less than the income generated for HK per dollar of PERFI for three reasons. First, as previously mentioned, the RGM of HK's re-exports of Mainland goods understates the RGM of re-exports that involve OP. The same holds for the RGM of offshore exports. Second, the re-export margin only includes services performed in HK but does not include export of services, that is, services performed in the Mainland by HK firms for its OP operations. Third, the income generated *in* HK is less than the income generated *for* HK because part of the profits of the affiliate belongs to the HK investor. Though the bulk of such profits is probably included in HK's margin of re-exports and offshore trade due to transfer pricing, not all profits are transferred. In the absence of better data, the RGM of HK's OP in the Mainland is taken as a lower bound of the income generated for HK per dollar of exports produced by HK's OP in the Mainland.

Figure 4. Rates of gross margin of Hong Kong's outward processing in mainland and mainland's PERFI



◆ HK's Outward Processing Re-Exported via HK ■ Mainland's PERFI ▲ HK's Outward Processing

7. Change in the rates of gross margin in the Mainland and in HK

Figure 4 shows that HK's RGM of OP in the Mainland (lower bound of income generated for HK) was higher than Mainland's RGM of PERFI (upper bound of income generated for the Mainland) in the 1994–2005 period of China's open-door era. However, Mainland's RGM of PERFI has surpassed HK's RGM of OP since 2004 due to the rapid decline of the latter and the gradual rise of the former. The substitution of local inputs for HK inputs (e.g., using Shenzhen ports rather than the HK port) would account for both trends in Mainland's and HK's RGMs.

HK's relatively high "take" in the 1994–2005 period indicated that HK performed many value-adding services for processing operations in the Mainland, including product design, production management, marketing, taking orders from final importers, sourcing, quality control, trade financing, coordination of shipping, and so forth, whereas Mainland's role was confined to assembly or fabrication. The fact that the Mainland was dependent on HK for so many of these services shows the rigidities of Mainland's transitional economy until 2003, when Mainland's RGM of PERFI began to equal or surpass the RGM of HK's OP, reflecting the rapid development of Mainland's market economy.

7.1 Trend of RGMs of China's processing exports

Table 2 shows that the changes over time of the RGMs of P&A and PIM are somewhat different. For P&A, the rates for both domestic enterprises and FIEs rose rapidly from 1994–98, but peaked in 1998 and declined thereafter. For PIM, the rates for both domestic enterprises and FIEs also rose rapidly from 1994–98. After 1998, the rates hovered around the 1998 levels (53 percent for domestic enterprises and 30 percent for FIEs) till 2005 without an obvious trend except for a spike in 2001. However, the rates seem to rise again in 2006, though it is difficult to discern a trend with only one year's data. The rates for all processing exports, and for those related to foreign investment, exhibited a similar pattern: rising rapidly from 1994 to 1998, hovering around the 1998 levels till 2005 without an obvious trend except for a spike in 2001, and rising again in 2006. The reasons for change in the rates will be analyzed subsequently.

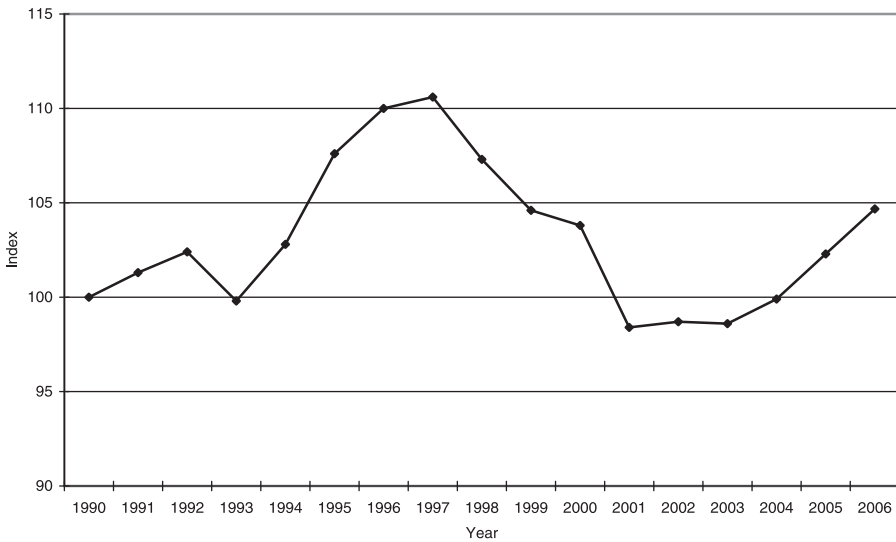
The substantial rise in the RGMs of processing exports from 1994 to 1998 is, in part, a statistical artifact caused by a decrease in smuggling. Some processing operations were mere shelters for the illegal sale of tariff-free imported materials in the domestic market, which exaggerates the amount of imported inputs and lowers the processing margin. From anecdotal evidence, it would seem that smuggling was rampant until the crackdown in the fall of 1997.

However, there is also evidence that the rise in the rate of processing margin is partly caused by an increase in backward and forward linkages, indicating that economic reforms have increased the flexibility of the Chinese economy. A prominent example of forward linkage is the development of Mainland ports that compete with the HK port. Backward linkage has also been important. Initially, China's FIEs consisted largely of relocated labor-intensive downstream operations involving processing and assembling. This created a demand for intermediate inputs, which was partly met by the relocation of midstream and upstream operations from elsewhere, and also by local enterprises (Naughton 1997, p. 296).⁹

7.2 Recent stagnation in the RGM of Mainland's PERFI

Although the rise in the RGM of Mainland's PERFI from 1994 to 1998 is the expected result of economic development and economic reforms, it is perplexing that the rate has hovered at around the 1998 level of approximately 32 percent until 2005 (Table 2). This seems to imply that the linkage and learning effects have not

⁹ It should be noted that the RGM of Mainland's PERFI and the RGM of HK's OP are not exact mirror images due to many reasons. There are statistical quirks such as China's crackdown on smuggling. Moreover, HK's OP constitutes a falling share of Mainland's PERFI due to the entry of other investors.

Figure 5. Unit value index of Hong Kong's imports from the Chinese mainland

developed further, and the upgrading of Mainland's processing exports has stopped.¹⁰

The definitive explanation of stagnation in Mainland's PERFI awaits further study. China's WTO entry in 2002 may play a role, as China has to phase out its local content requirements. The deterioration of Mainland's terms of trade since 1998 is probably a more important factor. Price competition in labor-intensive exports has increased sharply after 1997 as a result of the sudden currency depreciations in East Asia caused by the Asian financial crisis. The unit value index of HK's imports from the Mainland, over 70 percent of which involve OP (Sung 2005, pp. 88–90), can be taken as a proxy of the unit value index of Mainland's PERFI (Figure 5). The index

10 The spike of the RGMs of PIM in 2001 appears to be a statistical artifact of the sudden slowdown of China's processing exports in 2001, the year of the 11 September terrorist attack. As mentioned before, our calculation assumes that imported inputs are all used in export production in the same year. When exports are growing rapidly, our measure would understate the true RGM due to time lag in production. A sudden slowdown of exports would lead to a spike in the computed RGM. The growth of China's processing exports dropped from 24 percent in 2000 to 7 percent in 2001, leading to the spikes of the RGMs in 2001. Except for the 2001 spike, the RGM of Mainland's PERFI was less than the 1998 RGM of 32 percent from 1999 to 2004 (Table 2).

rose sharply from 99.8 in 1993 to the peak of 110.6 in 1997. This is consistent with quality upgrading and the sharp rise in the RGM of Mainland's PERFI in the period. However, the index peaked in July 1997 and declined sharply thereafter to a low of 98.4 in 2001, falling by 11 percent in 4 years. The sharp decline in the index since July 1997 is obviously related to the Asian financial crisis that led to the depreciation of many East Asian currencies and increased the pressure of price-competition among Asian exporters.

Export unit values have recovered partially since 2001. However, this recovery was more than offset by the rising import prices of oil, minerals, and raw materials. According to a study of UNCTAD, China's terms of trade fell by nearly 6 percent from 2001 to 2004 (UNCTAD 2005, p. 99). In East and South Asia as a whole, terms of trade fell by 15 percent between 1997 and 2004 (UNCTAD 2005, p. 92).

As previously mentioned, quite a few studies have concluded China is successful in climbing the technological ladder because the commodity composition of its exports has shifted rapidly from low-tech to high-tech products. For instance, a study of the Development Research Center of China's State Council emphasized that, from 2001 to 2005, the share of electrical and electronic products in Mainland's exports has risen from 21.9 percent to 30.6 percent, whereas the share of textiles, clothing and footwear has fallen from 24.7 percent to 7.9 percent (Zhang 2006). Whereas electrical products are regarded as high-tech products, the assembling of such products is often low-tech in the age of globalized production and splitting of the production chain among many countries. It is more important to examine the rate of value-added in production, as complaints about DVD and MP3 manufacturing in the Chinese press have revealed.

It can even be argued that the linkage and learning effects of electrical products are much less than that of traditional labor-intensive exports such as textiles and clothing. This is because the manufacture of the high-tech components of DVDs, PCs, and laptop computers involves specific proprietary technology that is not easily acquired. For a developing country, it may be easier to achieve upgrading in clothing exports than in exports of DVDs.

It should be noted that, in the assembling of high-tech electrical machinery, the gross margin as defined in this paper (value of exports minus imported inputs) may vastly overstate the domestic value-added due to the payment of patent fees to foreign enterprises. In the processing of traditional goods such as textiles and clothing, the gross margin is a better proxy for domestic value-added.

8. Policy switch in China's foreign trade and investment regime

Since late 2004, China's leadership has repeatedly called for a switch from extensive growth to intensive growth, stressing the importance of quality rather than quantity. The switch was enshrined in China's 11th Five-Year Plan (2006 to 2010), which was announced in 2005. A prominent goal of the plan was the ongoing development of China's autonomous technological capacity.

In line with the Plan, China is trying to shift foreign investment from simple processing, assembly, and low-end production to high value-added and innovative activities (Hong Kong Trade Development Council 2006). In September 2006, China announced that the export tax rebates for certain high-pollution and high-resource consumption products would be removed or reduced, and the export tax rebates for high-tech and high-value products would be raised. The Ministry of Commerce would further upgrade the product structure of processing exports by expanding the list of products in the prohibited and restricted categories. In November 2006, the National Development and Reform Commission called for a radical change from "quantity" to "quality" in utilization of foreign investment. The previous emphasis on volume of investment and preference for export-oriented investment will be shifted to importing advanced technology, management expertise, and high-caliber talents (Hong Kong Trade Development Council 2006, p. 6).

China is also planning to unify the income tax rates for domestic and foreign enterprises at 25 percent in 2008. The tax breaks for export-oriented FIEs will be rescinded, but high-tech enterprises will enjoy a preferential rate of 15 percent (Hong Kong Industrialists 2007, p. 52).

It is interesting to note that, in 2006, the rising share of FIEs in China's exports was reversed: the share of FIEs in China's exports declined from the peak of 58.3 percent in 2005 to 58.2 percent in 2006. The share of China's exports related to foreign investment likewise declined from the peak of 63.6 percent to 62.5 percent (Figure 2). Although the decline is small, this is the first reversal since the inauguration of China's open policy in 1978. In 2005 and 2006, there is also an increase in the RGM of China's processing exports, from 32.4 percent in 2004 to 34.2 percent in 2005 and 37 percent in 2006 (Table 2). As the reversals are very recent, it is too early to tell if they are the results of the policy switch since late 2004. However, the reversals are certainly consistent with China's policy switch toward processing exports.

9. Conclusion

The share of China's exports related to foreign investment is high, rising to a record of 64 percent in 2005 (see Figure 2). China's processing exports are increasingly dominated by low value-added production of FIEs. Although the rate of value-added of the processing exports of domestic enterprises is much higher, they have a dwindling share of the market, partly because there are many rigidities in the China's transitional economy that constrain domestic enterprises rather than FIEs.

The many distortions of China's transitional economy can only be rectified gradually. Given such distortions, foreign investment represents a second-best instrument that allows China to reap the benefits of international specialization despite the institutional rigidities of its economy. However, China's dependence on foreign investment for exports should be transitional. As China moves toward a market economy, its undue dependence on foreign investment for exports should diminish. Though China has moved toward a market economy quite rapidly, the generous preferences China gives to foreign investors may unnecessarily prolong China's dependence on foreign investment. The emerging private enterprises of China have to compete in an arena dominated by FIEs.

Export processing represents the creation of an enclave facing world market prices within a tariff-ridden economy. With import liberalization and successful economic reforms, the enclave should eventually merge with the rest of the economy. There are some signs that this is happening. For instance, the share of processing exports in total exports peaked at 57 percent in 1998, and declined slowly thereafter (Figure 1). There is partial convergence in the rates of value-added of processing and non-processing exports from 1995 to 2005, though the gap in the rates remained large (Table 3).

However, whereas the FDI-processing exports enclave is weakening in some ways, it is strengthening in other ways. The share of processing exports produced by FIEs is high and rising, reaching a record of 84.5 percent in 2006 (Table 4). Both the shares of PERFI and FIEs in total exports rose to a peak in 2005. Though the RGM of PERFI rose rapidly from 1994 to 1998, reflecting increasing backward and forward linkages, the rate stagnated at around the 1998 level until 2005.

As China's system rewarded managers and local officials on quantitative targets, many Mainland analysts have lamented that the drive of local officials to fulfill quantitative targets has led to neglect of quality and innovation (*HK Economic Journal*, 6 May 2005). In 2005 China's 11th Five-Year Plan sought to switch growth from

the extensive mode to the intensive mode by restricting low-value-added and high-pollution exports, and encouraging high-tech and innovative activities. The switch is in the right direction because although China still has plentiful surplus labor, it is short of land, clean air, and natural resources. In terms of allocative effects, those PERFI that have low value-added may not be worth the negative externalities in environmental resources and in protectionist sentiments in overseas markets. In terms of growth effects, China is trying to build autonomous technological capacity. It is not satisfied with simply assembling imported components to earn foreign exchange as China is no longer short of foreign exchange.

From 2006 data, the policy switch appears to be having its intended effect of transforming China from the world's sweatshop to a global manufacturing center. However, the design of targets that would promote quality instead of quantity is an arduous task because quality is much more difficult to measure.

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