

MADE IN PRRD

The Changing Face of HK Manufacturers



Part II & Full Report



Federation of
Hong Kong Industries



創新科技署
Innovation and
Technology Commission

香港經濟研究中心
The Hong Kong Centre for Economic Research

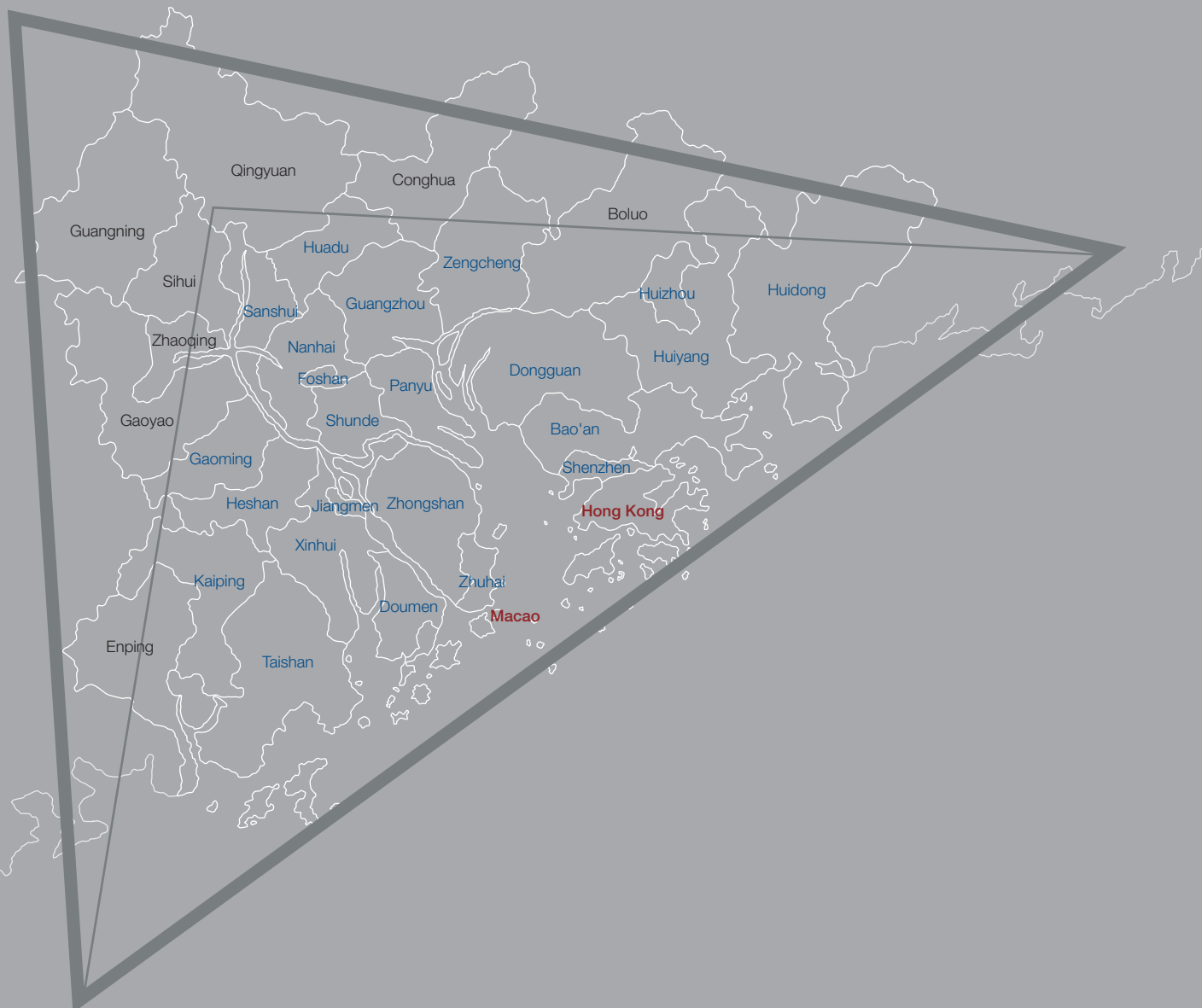
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The economic relationship between Hong Kong and the Pearl River Delta (PRD) Economic Zone has become an issue widely discussed since China adopted its open-door reform policy in 1979. Since then, many Hong Kong manufacturers have moved their production facilities to the PRD to take advantage of abundant land and labour supply. With this, the demand for producer services in Hong Kong has expanded hugely. As a consequence, it has transformed Hong Kong from a manufacturing-based economy into one engaged heavily in servicing Hong Kong manufacturers that have moved their operations across the border to the PRD. The rapid growth of manufacturers in the PRD has been the major impetus behind Hong Kong's economic development over the past two decades.

Producer services are those supporting or related services that serve manufacturing activities in the PRD, like logistics, warehousing, finance, insurance and legal services. It is estimated that today producer services account for around 50 per cent of Hong Kong's GDP. About 1.5 million jobs - that's over 40 per cent of Hong Kong's labour force - are related to Hong Kong companies' manufacturing activities in the PRD. Half a million of these jobs can be directly linked to these manufacturing activities in the PRD, while one million jobs result from producer services in support of these activities.

Hong Kong's inherent strengths – rule of law, simple and predictable tax regime, and regulatory framework, for example – have assured it continues to play an important, complimentary role to PRD enterprises. Indeed, most Hong Kong manufacturers that moved their labour intensive operations across the border over the past two decades still retain an office in Hong Kong.

Undeniably, Hong Kong industry has made giant strides and tremendous contributions to China's economic reform and growth over the past twenty years, particularly in the PRD region. Hong Kong's economy has also benefited from investments in the Mainland, as reduced production costs have allowed its manufacturing industry to grow rapidly and maintain its competitive edge in the global market.

Today the PRD region is one of the largest suppliers of manufactured goods in the world. This sector, which primarily comprises of Hong Kong companies, continues to expand and upgrade its business sector. The introduction of modern management practices and investments in human resources and technology have and continue to transform what was once farmland into one of China's most successful economic growth and development areas.

Considering the size and immense economic importance of the Greater PRD region, it is surprising that only very limited research based statistics are available on it. Before this study the relationship between the economic and R&D activities of Hong Kong's industrial companies in the PRD and the development of Hong Kong's economy had not been analysed in any great detail. There was also a lack of information on the R&D capabilities of Hong Kong manufacturers with a production base in the PRD.

Concerned about the lack of readily available statistics on this region, the Federation of Hong Kong Industries applied to the Hong Kong SAR Government's Innovation and Technology Commission for funding for a study on the R&D and production-related activities of Hong Kong manufacturers in the PRD. The Hong Kong Centre for Economic Research was commissioned to undertake this project. The Project leader was Professor Richard Wong, director of the Centre.

Funding was agreed in early 2002, and with the help of 31 sponsor organisations, *Made in PRD – The Changing Face of Hong Kong Manufacturers* commenced shortly after in April. It is my pleasure to introduce to you the Final Report of the study.

Its arrival is timely: just eighteen months after China's WTO entry, as discussions into a closer economic partnership arrangement (Cepa) between Hong Kong and the Mainland near conclusion, and as talk of Hong Kong-Guangdong integration gains momentum.

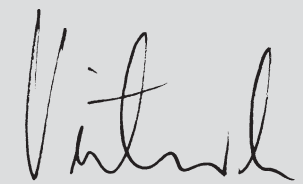
Made in PRD provides a scientific and comprehensive analysis of the key players in this dynamic market and the changing face of Hong Kong manufacturers and their manufacturing activities in the PRD.

The study findings will help manufacturers and producer service providers formulate long-term business strategies. The Hong Kong Government and industry-support bodies can

use this report to help define the development needs of manufacturers, especially in terms of their technological requirements.

By making reference to the prevailing R&D capabilities of Hong Kong manufacturing companies and the growing economic ties between Hong Kong and the PRD, policy makers can use *Made in PRD* when formulating the strategic direction of Hong Kong's technological and economic development.

Perhaps above all, this survey will help businesses, associations and governments on both sides of the Hong Kong-Shenzhen border to make informed decisions that help to secure the prosperous development of the Greater PRD region for years to come.

A handwritten signature in black ink, appearing to read "Victor Lo".

Victor Lo
Chairman
Federation of Hong Kong Industries
June 2003

Chapter 1

The Changing Face of Hong Kong Manufacturing

1.1 Introduction

One of the most significant economic developments to take place in Asia in the last quarter century has been the emergence and growth of the Pearl River Delta (PRD) and the role Hong Kong has played in its economic rise. The PRD is the world's fastest-growing export-oriented manufacturing region. The Yangtze River Delta (YRD), centered in Shanghai is also a fast growing manufacturing base that is attracting foreign direct investment (FDI) and producing exports for the world market.

Guangdong's rise has afforded Hong Kong based manufacturers an opportunity to relocate and expand their production activities across the border. As industrialization took off in Guangdong, companies from the rest of Asia and elsewhere have relocated some production activities to the PRD. In turn, Hong Kong has been transformed into largely a producer services center supporting and driving the manufacturing base in Guangdong.

The purpose of this report is to study the manufacturing activities of Hong Kong based companies in Guangdong. While this is not a comprehensive study of all manufacturing activities in the Greater PRD Economic Region, it covers approximately two-thirds of the manufacturing activity in Guangdong. An estimated 58 percent are activities conducted by foreign-funded enterprises (FIEs), which do not include manufacturing activities belonging to operations classified under "three forms of processing/assembly and compensatory trade." An important task of the study is to provide a better estimate of the true scale of all forms of manufacturing activities in Guangdong that are conducted by Hong Kong based companies.

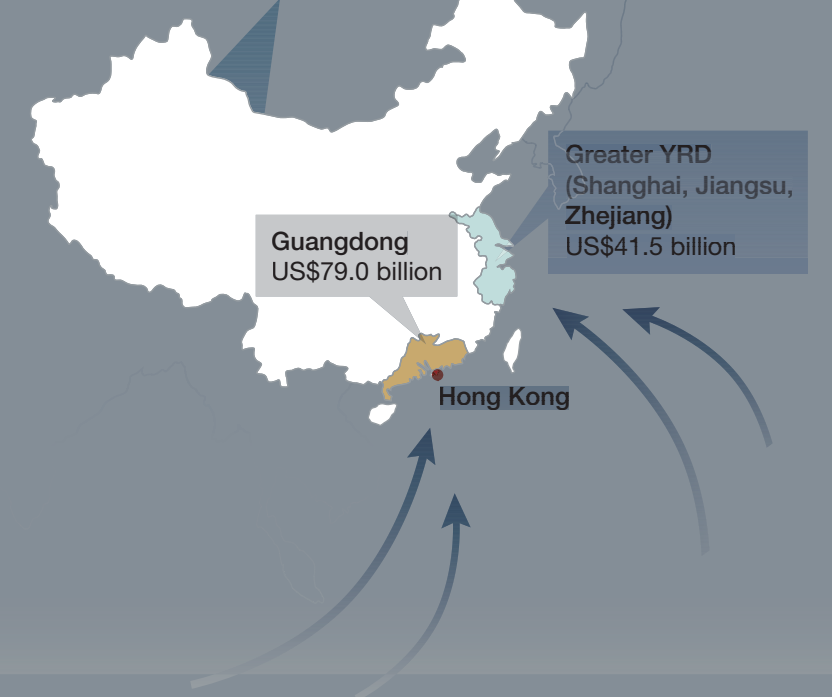
In light of the limitations of official Chinese statistics, we decided to obtain more reliable survey information. The main corpus of our study relies on three surveys. Part I survey attempts to draw a general picture of the key characteristics of the operations of Hong Kong based manufacturers in China, including the scale, geographic distribution, ownership structure,

organizational form, and management and contractual arrangements of their operations. To obtain the necessary information, we conducted a survey of some 123,000 Hong Kong registered manufacturing and import-export (HKM&T) companies in April 2000 (referred to hereafter as the Part I survey).

We made a particular point of including import-export companies because with the relocation of production activities across the border, many manufacturers have become traders in Hong Kong. Moreover, many traders operate export-processing activities through subcontracting arrangements in China. Including import-export companies is therefore necessary to obtain a true picture of Hong Kong's manufacturing activities in China. We also seek to understand the extent to which these companies rely on Hong Kong's ports for shipping their goods overseas and for sourcing production materials abroad. Our main findings are reported in chapter 2.

HK is the biggest foreign investor in both Guangdong and Greater YRD. Most of the investments, especially those in the PRD, are in manufacturing.

FDI Inflows from Hong Kong (1979-2001)



The partnership between Guangdong and Hong Kong has developed over a period of some 20 years. As the business environment in Guangdong continues to improve and as more highly skilled workers immigrate to Guangdong, there is considerable scope for locating higher value-added activities across the border. Part II survey investigates the current division of activities performed in Hong Kong and Guangdong by businesses that have operations on both sides of the border, the reasons behind the divisions, and how these divisions are expected to evolve. Special attention is given to issues relating to the business environment, human resources problems, the role of research and development (R&D), and possible areas for government action. A second stage survey of some 1,500 companies with manufacturing activities in China obtained in the Part I survey was targeted for a second survey, which was conducted in November 2002.

Part III interviews are a series of in-depth interviews of 21 representative Hong Kong entrepreneurs with operations in Guangdong. The purpose of these interviews was to gain insight into the considerations that determined R&D investments, human resources strategies, production operations and business plans. The findings of the Part II survey and the Part III interviews and their implications are reported in chapter 3.

One factor that plays a part in determining whether PRD has any potential to upgrade its manufacturing production into higher value-added activities is the role of R&D investments. We surveyed Hong Kong based companies with manufacturing operations in Guangdong to assess the extent of their R&D activities and their future plans for R&D. The prospect of engaging in R&D activities in Hong Kong and in the PRD and the YRD are compared, taking into account cost and financing considerations, availability of human resources, protection of intellectual property rights, and provision of R&D infrastructure. We also explore the extent of R&D activities that are

undertaken throughout China and especially in the PRD and YRD. Our findings are analyzed in chapter 4.

At present, the overwhelming proportion of manufacturing activities of Hong Kong based companies have been in Guangdong, although there is a growing trend of expansion into the YRD. This new development should be studied because at present Hong Kong is the largest foreign investor in the YRD. For this reason, our study compares the Greater PRD Economic Region and the Greater YRD Economic Region as manufacturing bases. A variety of indicators are used to assess the current status and future potential of the two regions as areas for attracting overseas investments in manufacturing production. We consider the role of producer services in enhancing the value of manufacturing production and how Hong Kong can contribute to the development of both regions. The results and their interpretations are presented in chapter 5.

1.2 Hong Kong's Role

We use the study findings to formulate a comprehensive portrait of the important factors that are driving the growth of manufacturing activities in the Greater PRD Economic Region and the region's future evolution, and to draw out any policy implications that the Hong Kong SAR government and other relevant parties should consider. We are particularly interested in policies that are important for sustaining the future growth of the PRD as a powerhouse for manufacturing production.

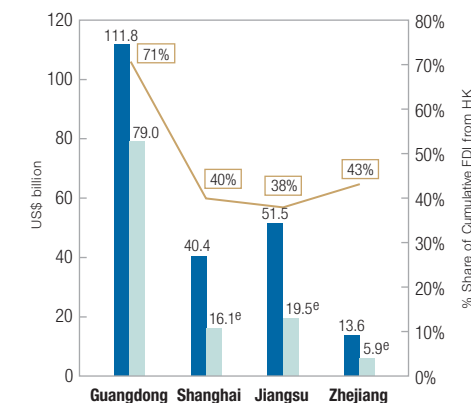
Since China's opening, Hong Kong has been the single largest source of FDI into Guangdong, Shanghai, Jiangsu, and Zhejiang. Over time, Hong Kong investments in Shanghai, Jiangsu, and Zhejiang have also been increasing rapidly, but the lion's share of that investment has always been in Guangdong. Most of the investments, especially those in the PRD, are in manufacturing. According to official Chinese statistics, during the period 1979-2001 (see Figure 1.1), the cumulative FDI from Hong Kong in Guangdong amounted to US\$79.0 billion, accounting for 71 percent of total cumulative FDI inflows in Guangdong. During the same period, estimated cumulative FDI inflows into Shanghai, Jiangsu, and Zhejiang from Hong Kong were, respectively, US\$16.1 billion, US\$19.5 billion, and US\$5.9 billion, accounting for 40 percent, 38 percent, and 43 percent of their respective total cumulative FDI inflows.

Clearly, Hong Kong is a more important investor in the PRD than in the YRD by a considerable margin. Nevertheless these figures still understate Hong Kong's role in the PRD's growth, because official Chinese statistics on FDI inflows exclude foreign investments in export-processing activities. Guangdong is the only Chinese province that is a significant recipient of foreign investments in export-processing activities, and Hong Kong is its major source of such investments. The omissions lead to an underestimation of the economic linkages between Hong Kong and Guangdong, and, in turn, of the importance of foreign direct investments in Guangdong (see Figure 1.2).

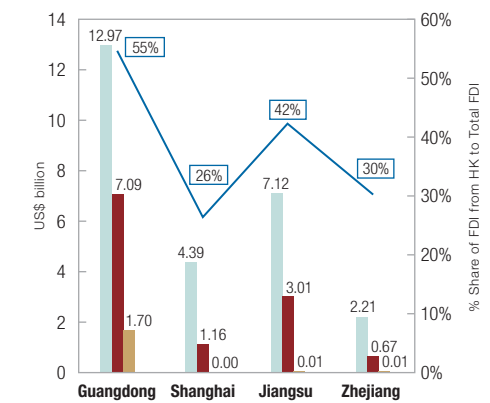
Figure 1.1:
Total Cumulative FDI Inflows in Guangdong, Shanghai, Jiangsu and Zhejiang, 1979-2001



Figure 1.2:
FDI and Export Processing Investments from Hong Kong, 2001



Source: Guangdong Statistical Yearbook, Shanghai Statistical Yearbook, Jiangsu Statistical Yearbook, Zhejiang Statistical Yearbook, Almanac of China's foreign economic relations and trade, various issues



Source: Guangdong Statistical Yearbook 2002, Shanghai Statistical Yearbook 2002, Jiangsu Statistical Yearbook 2002, Zhejiang Statistical Yearbook 2002

Interestingly, the omission is one reason behind a growing belief that Hong Kong's role as an investor in the PRD is declining at a faster rate than is actually the case. According to official Chinese statistics for 1992 and 2002, FDI from Hong Kong into Guangdong had increased from US\$3.1 billion to US\$7.1 billion, accounting for 86 percent to 55 percent of FDI inflows in Guangdong in their respective years. By contrast, FDI from Hong Kong into Shanghai, Jiangsu, and Zhejiang over the same period increased, respectively, from US\$0.5 billion to US\$1.2 billion, US\$0.8 billion¹ to US\$3.0 billion, and US\$0.2 billion to US\$0.7 billion, accounting for 33 percent to 26 percent, 56 percent² to 42 percent, and 82 percent to 30 percent of their respective FDI inflows. But these figures do not take into account Hong Kong's

¹ Our estimate.
² Our estimate.

investments in export-processing activities, which should also be added to the FDI figures.

Beginning in 1997, two trends in FDI patterns can be observed. First, FDI inflows from the British Virgin Islands (BVI) and other offshore tax havens (see Figure 1.3) into Guangdong have surged substantially. It is plausible that some of the FDI inflows originating from Hong Kong might have assumed a BVI identity; otherwise there is no rational explanation for the sudden surge in BVI registered companies in Guangdong. Second, there has been a substantial increase in foreign investments in export-processing activities. And it is reasonable to assume that most of these investments are likely to have originated from Hong Kong. In 2001, the total value of foreign investments in

export-processing activities was US\$1.7 billion, which amounted to 13 percent of total FDI in Guangdong in that year. If we add part of the FDI inflows from the BVI and Hong Kong's investments in export-processing activities to Guangdong's FDI figures, a somewhat different picture of the scale and trend of total FDI emerges. It is not obvious what proportion of these investments should be attributed to Hong Kong based companies; but it is useful to know what the upper bound is likely to be.



1.3 The Pearl River Delta – The Fifth Asian Dragon

The PRD region is an evolving concept. The idea of a "small PRD region" was first introduced in 1985. At that time the region included 16 municipal cities and counties (districts) but excluded Guangzhou, Zhuhai, and Shenzhen. In 1987, the idea of a "big PRD region" embracing all open economic areas, including Guangzhou, Zhuhai, and Shenzhen emerged.

In 1994, an official definition adopted by the Guangdong Provincial Government was used to characterize a more advanced and economically integrated region known as the Pearl River Delta Economic Zone. This new definition corresponds to the light brown area in Map 1.1 that is situated in the core coastal area of Guangdong Province adjacent to Hong Kong and Macao. It covers 14 cities and counties, including Guangzhou, Shenzhen, Zhuhai, Foshan, Jiangmen, Dongguan, Zhongshan, the

urban district of Huizhou, Huiyang County, Huidong County, Boluo County, the urban district of Zhaoqing, Gaoyao, and Sihui. The boundaries of the Pearl River Delta Economic Zone may be shifting over time as more economic activities spread to outer parts of Guangdong Province beyond the Pearl River Delta Economic Zone. The rapid relocation of economic activities is likely to prompt policy-driven consolidations to form larger administrative units through mergers and to lead to a new definition of what constitutes the Pearl River Delta Economic Zone.



Different analysts have defined the PRD in a variety of ways, depending on the question they wish to address. If the objective is to facilitate comparison with the rest of China on a province-by-province basis, then Guangdong is the appropriate unit of analysis. This definition can be useful, largely because comparison data are usually easily

obtainable. Nevertheless, to study the economic links between Hong Kong and Guangdong, the definition may not be ideal because a significant portion of economic activities (i.e., export-processing activities and compensatory trade) are considered as export-import arrangements on the Mainland. These arrangements exist in other provinces in the Mainland but are far more pervasive in Guangdong. And in Guangdong, unlike other provinces, the foreign partner has ownership in and management control of the production facilities. Commonly cited official Chinese statistics on foreign direct investments therefore understate the level of such activities in Guangdong and the important economic role of Hong Kong companies there.

From an economic perspective, it is therefore much more useful to think of a Greater PRD Economic Region as embracing Hong Kong, Macao, and

Figure 1.3:
Guangdong's FDI from Hong Kong with Adjustments, 1986-2001



Source: Guangdong Statistical Yearbook 2002

Map 1.1:
Greater PRD Economic Region and PRD Economic Zone



Guangdong. The rationale here is that, economically, Guangdong is highly integrated with Hong Kong and Macao even though the region is divided into several separate administrative areas. Companies based in Hong Kong and to a lesser extent in Macao manage a large fraction of the export-oriented manufacturing economic activities in Guangdong. Hong Kong investors own most of these companies, but investors from Taiwan, South Korea, Japan, and elsewhere – including the Mainland – own some of them. The integration is based on manufacturing activities, but it goes beyond these activities to embrace producer services that support the production of goods for export.

Viewed from this perspective, the PRD is a growing economic region on the southern coast of China. Its economic development and industrialization have until now been driven largely by Hong Kong. The region has close links to the other Asian Dragons and to the rest of the world through international trade and investment flows. Its development reflects a new international division of labour that grew out of China's opening and the application of entrepreneurial and managerial expertise of the older Asian Dragons.

In 2001, the Greater PRD Economic Region, comprising Guangdong,

Table 1.1: Major Indicators of China and Guangdong

	China			Guangdong		
	1978	2002	Average Annual Growth Rate (%)	1978	2002	Average Annual Growth Rate (%)
GDP						
at current price (RMB billion)	362.4	10,239.8	14.9	18.6	1,167.4	18.8
at comparable price (1978=100)	100.0	855.4	9.4	100.0	2,018.0	13.3
Value Added of Industry						
at current price (RMB billion)	160.7	4,593.5	15.0	7.6	523.2	19.3
at comparable price (1978=100)	100.0	1,343.0	11.4	100.0	4,218.0	16.9
GDP per capita (RMB)	376.5	8,023.2	13.6	367.0	13,698.3	16.3
GDP per capita (US\$)	238.3	969.4	6.0	232.3	1,655.0	8.5
Exports (US\$ billion)	9.8	325.6	15.7	1.4	118.5	20.4
	1979	2002	1979-2002	1979	2002	1979-2002
FDI (US\$ billion)	0.1	52.7	30.8	0.0	13.1	30.1

Source: China Statistical Yearbook 2002, Guangdong Statistical Yearbook 2002, National Bureau of Statistics of China

Hong Kong, and Macao, had a combined gross domestic product (GDP) of US\$299 billion, which is about a quarter of the combined GDP of the Asian economies of South Korea, Taiwan, Indonesia, Malaysia, the Philippines, Singapore, Brunei, and Thailand, which stood at US\$1,214 billion during that year.

In 2001, the total value of exports from Guangdong, Hong Kong, and Macao

amounted to US\$288.8 billion, representing 4.69 percent of total world merchandise exports. In the same year total exports from the six Southeast Asian economies amounted to US\$366.0 billion, representing 5.95 percent of total world merchandise exports. It is useful to exclude the value of re-exports from the Hong Kong's and Singapore's export figures to better assess the manufacturing activities as opposed to the trading activities that take place in these two economic regions. Domestic exports from Guangdong, Hong Kong³,

and Macao amounted to US\$152.4 billion in 2001, representing 2.56 percent of total world merchandise exports⁴. The corresponding domestic export figure for the six Southeast Asian economies was US\$310.4 billion, representing 5.24 percent of total world merchandise exports. These figures suggest that Hong Kong's trading and manufacturing activities are far more closely integrated within the PRD Economic Region than Singapore's trading and manufacturing activities are within the Southeast Asian economies.

Table 1.2: Exports in Greater PRD Economic Region and Asian Economies, 2001

	Total Exports (US\$ billion)	Domestic Exports ¹ (US\$ billion)	Re-exports ² (US\$ billion)
Greater PRD Economic Region	288.8	118.0	170.8
Hong Kong	191.1	20.3	170.8
Guangdong	95.4	95.4	
Macao	2.3	2.3	
Southeast Asian Economies	366.0	310.4	55.6
Singapore	121.8	66.1	55.6
Malaysia	87.9	87.9	
Thailand	65.1	65.1	
The Philippines	32.1	32.1	
Indonesia	56.3	56.3	
Brunei	2.8	2.8	
Northeast Asian Economies	272.9	272.9	
South Korea	150.4	150.4	
Taiwan	122.5	122.5	
Total World Merchandise Exports	6,155.0	5,928.6	5,962.0

1. Figures for domestic exports exclude significant re-exports in Hong Kong and Singapore
2. Figures for re-exports include significant estimated profits from re-exports in HK (US\$34.4 billion)
Source: World Trade Organization

As early as 1992, a study titled *The Fifth Dragon – The Emergence of the Pearl River Delta* recognized the PRD's enormous economic potential.⁵ The study was conducted shortly after Deng Xiaoping embarked on his famous tour to the south in January 1992 to push for an even faster pace of economic reform and greater openness. The term "The Fifth Dragon" was used for the first time to portray economic development in the PRD. The authors of the study identified two features commonly shared by the PRD and the other four Asian Dragons. First, all five "dragons" experienced rapid and sustained economic growth that is unprecedented in any other part of the world. Second, their economic development is characterized by export-oriented industrialization. The PRD was aptly dubbed "The Fifth Dragon" for both of these reasons.

³ Includes significant estimated profits from re-exports (US\$34.4 billion).

⁴ Excludes significant re-exports in Hong Kong and Singapore and includes significant estimated profits from re-exports in Hong Kong.

⁵ See Y W Sung, P W Liu, Y C R Wong, and P K Lau, *The Fifth Dragon—The Emergence of the Pearl River Delta*, Addison Wesley, 1995, p. 259.

1.4 Manufacturing in Guangdong

The rise of the PRD has led to the rapid industrialization of Guangdong, where GDP has been growing at a rate of 13.3 percent per year in real terms over the period 1978-2002. The growth rate would be even higher if the more narrowly defined PRD Economic Zone was used, but would be lower if the more broadly defined Greater PRD Economic Region was used. Guangdong's growth rate exceeded China's overall growth rate of 9.4 percent per year over the same period. Guangdong's growth record also surpasses that of the other four Asian Dragons – Hong Kong⁶, Singapore⁷, South Korea⁸ and Taiwan⁹-by a considerable margin, when those four regions were at the same stage of development. The average economic growth rate of the four Asian Dragons during the first 25 years of their economic takeoff period was around 8.2 percent to 9.2 percent per year.

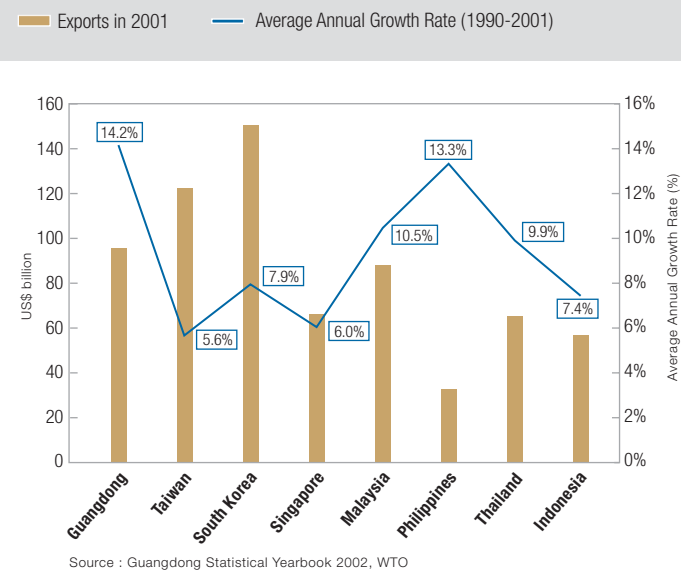
⁶ 1961 — 1986: 8.2%.
⁷ 1960 — 1986: 8.3%.
⁸ 1970 — 1986: 8.9%.
⁹ 1961 — 1986: 9.2%.

Driving the growth of Guangdong's manufacturing base is its export-oriented nature, which is in turn largely driven by FDI. In the period 1979-2002, Guangdong's FDI inflows increased from US\$0.031 billion to US\$13.1 billion at an average annual growth rate of 30.1 percent. China's FDI inflows increased from US\$0.109 billion in 1979 to US\$52.7 billion in 2002, which recorded a similar average annual growth rate of 30.8 percent. In the period 1978-2002, Guangdong's exports increased from US\$1.4 billion to US\$118.5 billion, which is equivalent to an average annual growth rate of 20.4 percent. This is higher than the growth rate of China's overall exports, which increased from US\$9.8 billion to US\$325.6 billion over the same period at an average annual growth rate of 15.7 percent.

Since 1978, exports from Guangdong have steadily surpassed those from each of the Southeast Asian economies,

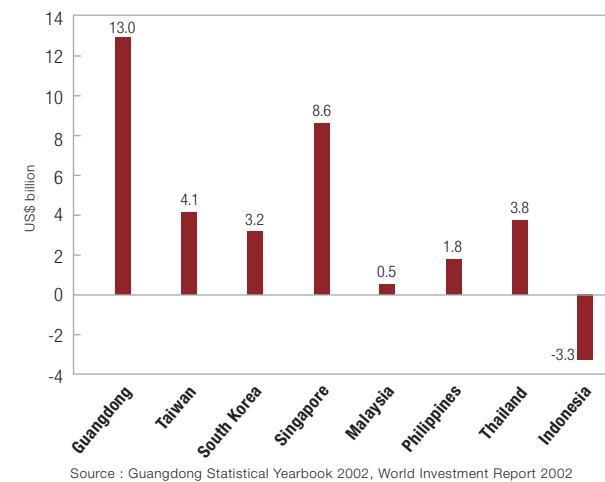
making Guangdong the single largest export-oriented manufacturing base in Asia. The share of Guangdong's exports in total world merchandise exports increased from almost zero in 1978 to 1.6 percent in 2002. In 2001, Guangdong's exports of US\$95.4 billion exceeded that of each of the Southeast Asian economies, including Singapore's US\$66.1 billion (domestic exports only), Malaysia's US\$87.9 billion, the Philippines' US\$32.1 billion, Thailand's US\$65.1 billion, and Indonesia's US\$56.3 billion, but falling somewhat short of South Korea's US\$150.4 billion and Taiwan's US\$122.5 billion (see Figure 1.4).

Figure 1.4:
Exports of Guangdong and Asian Economies

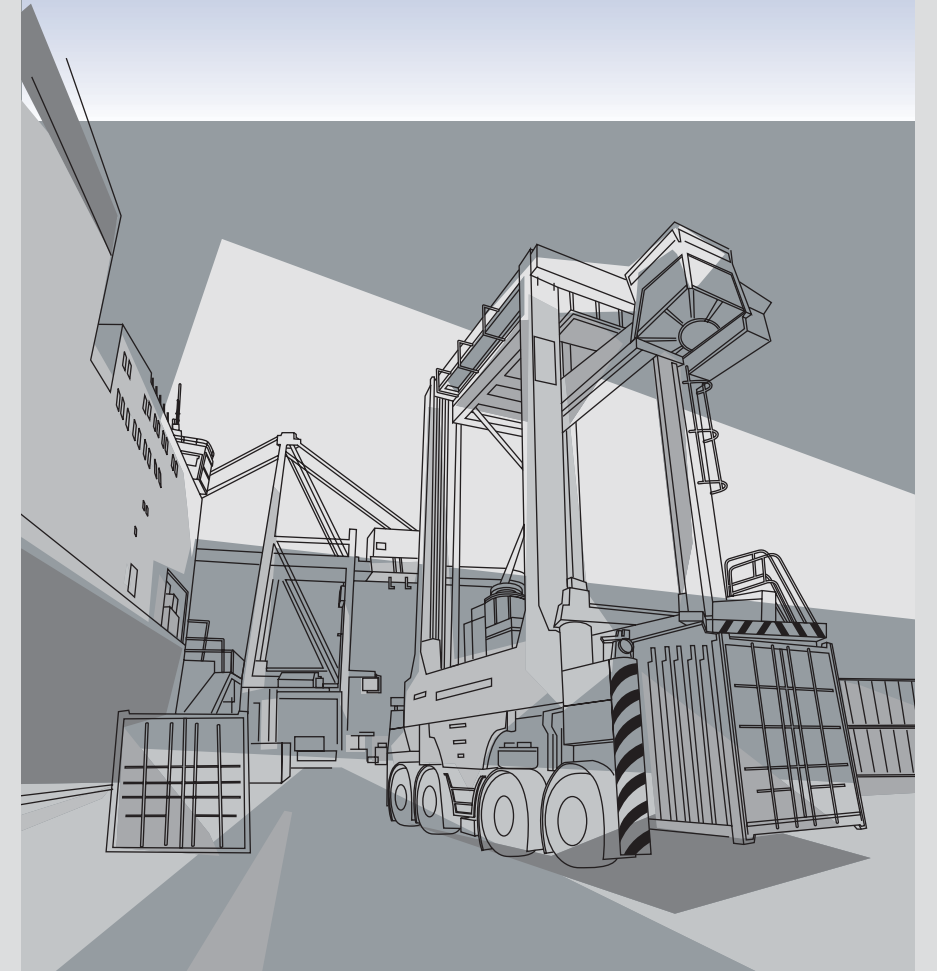


In 2001, FDI inflows into Guangdong amounted to US\$13.0 billion and exceeded FDI inflows for all the other Southeast Asian economies, including Singapore's US\$8.6 billion, Malaysia's US\$0.5 billion, the Philippines' US\$1.8 billion, Thailand's US\$3.8 billion, and Indonesia's US\$-3.3 billion (see Figure 1.5). The amount was even higher than Japan's US\$6.2 billion, South Korea's US\$3.2 billion, and Taiwan's US\$4.1 billion, but was lower than Hong Kong's US\$22.8 billion.

Figure 1.5:
FDI in Guangdong and Asian Economies



Driven by HK based companies and supported by HK's efficient producer service providers, the PRD has emerged as the world's fastest growing export-oriented manufacturing region.

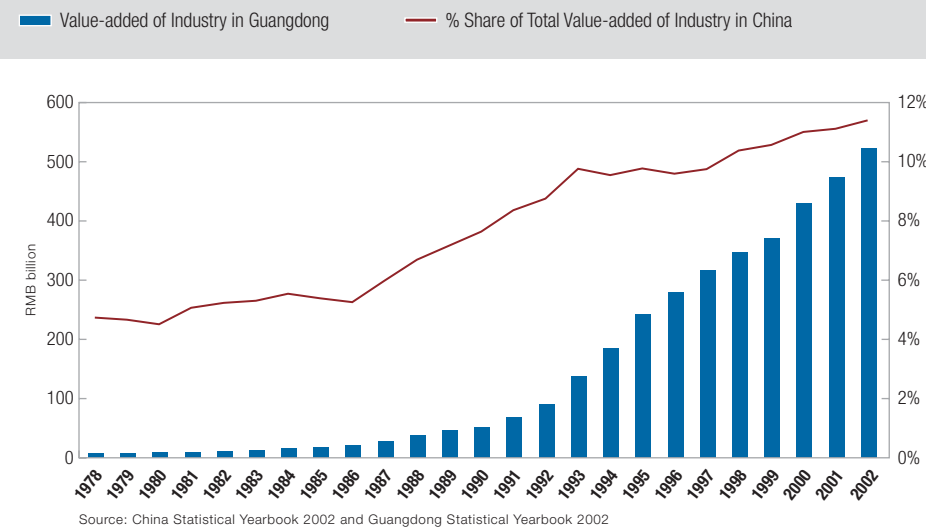


Over the period 1978-2002, Guangdong's industry value-added increased from RMB 7.6 billion (US\$4.8 billion) to RMB 523.2 billion (US\$63.2 billion). Guangdong's industry value-added (at a comparable price) increased at an average annual rate of 16.9 percent and was higher than the average annual rate of 11.4 percent for China as a whole. The share of Guangdong's industry value-added in China increased steadily from 4.7 percent in 1978 to 11.4 percent in 2002, making Guangdong the most industrialized province in China in terms of total industry value-added produced. The rapid industrialization of Guangdong has dramatically heightened the province's role as an industrial base within China and has turned it into Asia's manufacturing powerhouse (see Figure 1.6).

Guangdong's economic importance to China has grown as a consequence of rapid industrialization there. The standard of living of Guangdong residents has also improved dramatically in the past 20 years. Guangdong's nominal GDP per capita has been increasing at an average annual rate of 16.3 percent, rising from RMB 367 (US\$232) in 1978 to RMB 13,698 (US\$1,655) in 2002. Guangdong's performance in terms of GDP is better than China's overall nominal GDP per capita which increased at an average annual rate of 13.4 percent from RMB 376 (US\$238) in 1978 to RMB 8,023 (US\$969) in 2002.

HK/PRD integration is based on manufacturing activities, but it goes beyond these activities to embrace producer services that support the production of goods for export.

Figure 1.6:
Industry Value-Added in Guangdong and its Share in China, 1978-2002



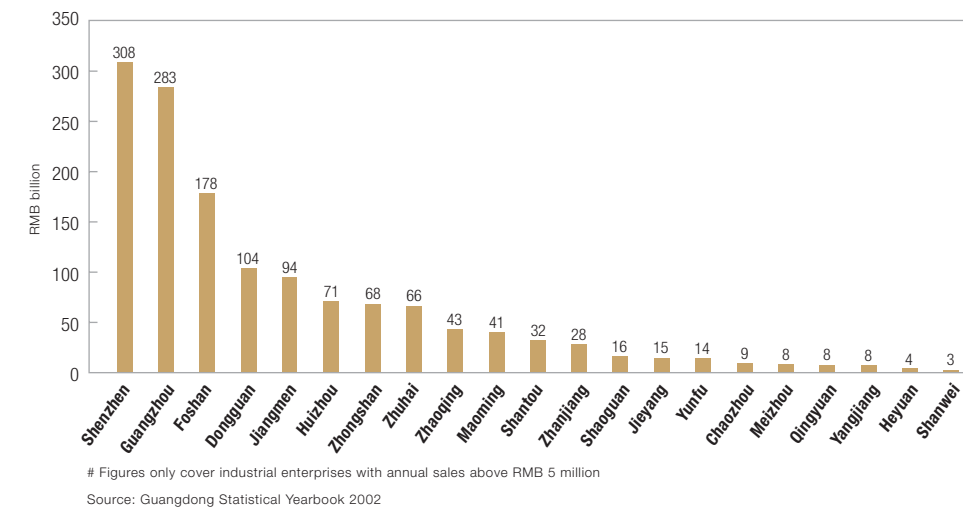
The development of manufacturing in Guangdong is not concentrated in one or two cities as is the case in many developing economies. It is spread widely throughout the PRD. The manufacturing base spans nine cities in Guangdong, located mainly in the PRD Economic Zone, and they accounted for 87 percent of total gross industrial output value¹⁰ in 2001. The five cities of Shenzhen, Guangzhou, Foshan, Dongguan, and Jiangmen produce, respectively, 22 percent, 20 percent, 13 percent, 7 percent and 7 percent of the total gross industrial output value in Guangdong. Around 70 percent of gross industrial output value in Guangdong is concentrated within this area of 25,303 km², with a population of 32 million.

The cities of Shenzhen, Huizhou, and Dongguan are heavily biased toward electronics and telecommunications, which represent 51 percent, 58 percent, and 34 percent, respectively, of gross industrial output value.

The shares of the top 10 largest manufacturing industries in Guangzhou and Jiangmen are quite evenly distributed as is reported in statistics for 2001. Five manufacturing industries in Guangzhou were ranked first in Guangdong, in terms of gross industrial output value. They are (1) the raw chemical materials and chemical products industry, (2) the transport equipment manufacturing industry, (3) the garments and other fiber products industry, (4) the textile industry, and (5) the food processing and manufacturing industry. The following three manufacturing industries were

¹⁰ The figure covers industrial enterprises with annual sales above RMB 5 million.

Figure 1.7:
Gross Industrial Output Value in Guangdong Cities#, 2001





ranked first in Jiangmen: (1) the metal products industry, (2) the electric equipment and machinery industry, and (3) the textile industry. The metal products industry in Jiangmen was ranked first in Guangdong in terms of gross industrial output value.

The top three manufacturing industries in Foshan were (1) the electric equipment and machinery industry, (2) the non-metal mineral products industry, and (3) the electronics and telecommunications industry. The first two were ranked first in Guangdong in terms of gross industrial output value. Figures of the total gross industrial output value in Huizhou, Zhongshan, and Zhuhai were quite similar in 2001. Their top two manufacturing industries were (1) the electronics and telecommunications industry and (2) the electric equipment and machinery industry.

Table 1.3: Top Three Industries in Major Guangdong Cities by Gross Industrial Output Value, 2001

	The First Largest	% share of (A)	The Second Largest	% share of (A)	The Third Largest	% share of (A)	Gross Industrial Output Value* (A) (RMB billion)
Shenzhen	Electronic and Telecommunications	51%	Electric Equipment and Machinery	6%	Plastic Products	3%	307.96
Guangzhou	Transport Equipment Manufacturing	12%	Raw Chemical Materials and Chemical Products	11%	Food Processing and Manufacturing	8%	282.92
Foshan	Electric Equipment and Machinery	27%	Non-metal Mineral Products	10%	Electronic and Telecommunications	8%	178.24
Dongguan	Electronic and Telecommunications	34%	Textiles	8%	Electric Equipment and Machinery	7%	103.97
Jiangmen	Metal Products	12%	Electric Equipment and Machinery	12%	Textiles	8%	94.44
Huizhou	Electronic and Telecommunications	58%	Electric Equipment and Machinery	8%	Plastic Products	5%	70.81
Zhongshan	Electronic and Telecommunications	17%	Electric Equipment and Machinery	12%	Metal Products	9%	68.44
Zhuhai	Electric Equipment and Machinery	20%	Electronic and Telecommunications	19%	Garments and Other Fiber Products	5%	66.23
Zhaoqing	Electronic and Telecommunications	13%	Textiles	7%	Metal Products	7%	43.04

Figures only cover industrial enterprises with annual sales above RMB 5 million.
Source: Guangdong Statistical Yearbook 2002

Chapter 2

Hong Kong's Manufacturing Operations in Guangdong

2.1 Surveying Hong Kong's Manufacturing Activities in Guangdong

Hong Kong's manufacturing activities in Guangdong can be studied using statistics collected either in Hong Kong or in Guangdong. Official Hong Kong statistics are primarily focused on recording the manufacturing activities of Hong Kong based companies (these are companies incorporated and registered in Hong Kong), regardless of the national origin of share ownership. Official Guangdong statistics are focused primarily on recording the manufacturing activities of foreign companies with Hong Kong share ownership. Both are valuable sources of information, but given their data-collection design, neither provides a complete and seamless picture of the various contractual forms through which Hong Kong based manufacturing activities operate in Guangdong. Official Hong Kong statistics do not capture manufacturing operations in Guangdong that are owned by Hong Kong based companies but are incorporated in other overseas jurisdictions. Official

Guangdong statistics do not capture as foreign investments domestic companies that are managed or controlled by Hong Kong based companies, including those with export-processing activities.

Since 1978, foreign investments in Guangdong have assumed two major forms. The first, "foreign funded enterprises" (FfEs) mainly refer to fully foreign owned ventures, joint ventures, and cooperative ventures in which the foreign investor has legal control of companies. Using official Guangdong statistics we estimate that FfEs from Hong Kong employed about 3 million manufacturing workers in 2001. As we shall see, this figure grossly underestimates the actual number.

The second, known as "other contractual forms" (OCFs), include those classified as "other foreign investments" (OFIs) and under "other arrangements" (OTHs). The OFIs consist mainly of "three forms of processing/assembly operations and compensatory trade," in

which the foreign partner does not have legal ownership of the companies. Under Chinese law, these companies are classified as domestic enterprises. The "three forms of processing/assembly operations" refer to processing supplied materials, assembling supplied parts, and processing in accordance with supplied samples. The OTHs are other arrangements by means of which Hong Kong based companies have shares in, control of, or manage domestic enterprises.

According to our survey, the OFIs or enterprises engaged in the “three forms of processing/assembly operations and compensatory trade” were the most prevalent form of investment chosen by Hong Kong based companies in Guangdong in terms of the number of factories established and the number of workers employed. However, official information and statistics on OFIs are quite limited for most of Guangdong’s cities, and there is no official information and statistics on OTHs.

Information and statistics for small industrial companies are far less available than those for large industrial companies. Companies with sales above RMB 5 million have to submit monthly financial statements and all provinces and municipalities publish these figures. Official annual surveys are conducted to collect information from companies with sales under RMB 5 million, but these figures are usually not publicly available. The provinces do not publish these figures with the exception of Guangdong, which began publishing then since the year 2000.

For example, a great deal of information is available for Type I companies (see box below), and this information is published in Guangdong Statistical Yearbooks and various city and county statistical yearbooks. However, far less information on Type II companies is available. There are also many institutional incentives for factories in China to understate the number of workers they employ. Guangdong has a disproportionate share of small companies and is therefore more susceptible than any other province to underreporting the true scale of its FFE operations. Information on Type III companies (i.e., OFIs and OTHs) is hard to come by, even though many such companies have existed in Guangdong for almost 20 years.



Companies Classified by Annual Sales Revenues	Classified as Foreign Investment		Pure Subcontracting Arrangements not Classified as Foreign Investments
	FFEs	OCFs*	
Large Industrial Enterprises (annual sales over RMB 5 million)	Type I	Type III	Type IV
Small Industrial Enterprises (annual sales under RMB 5 million)	Type II		
* OCFs = OFIs + OTHs			

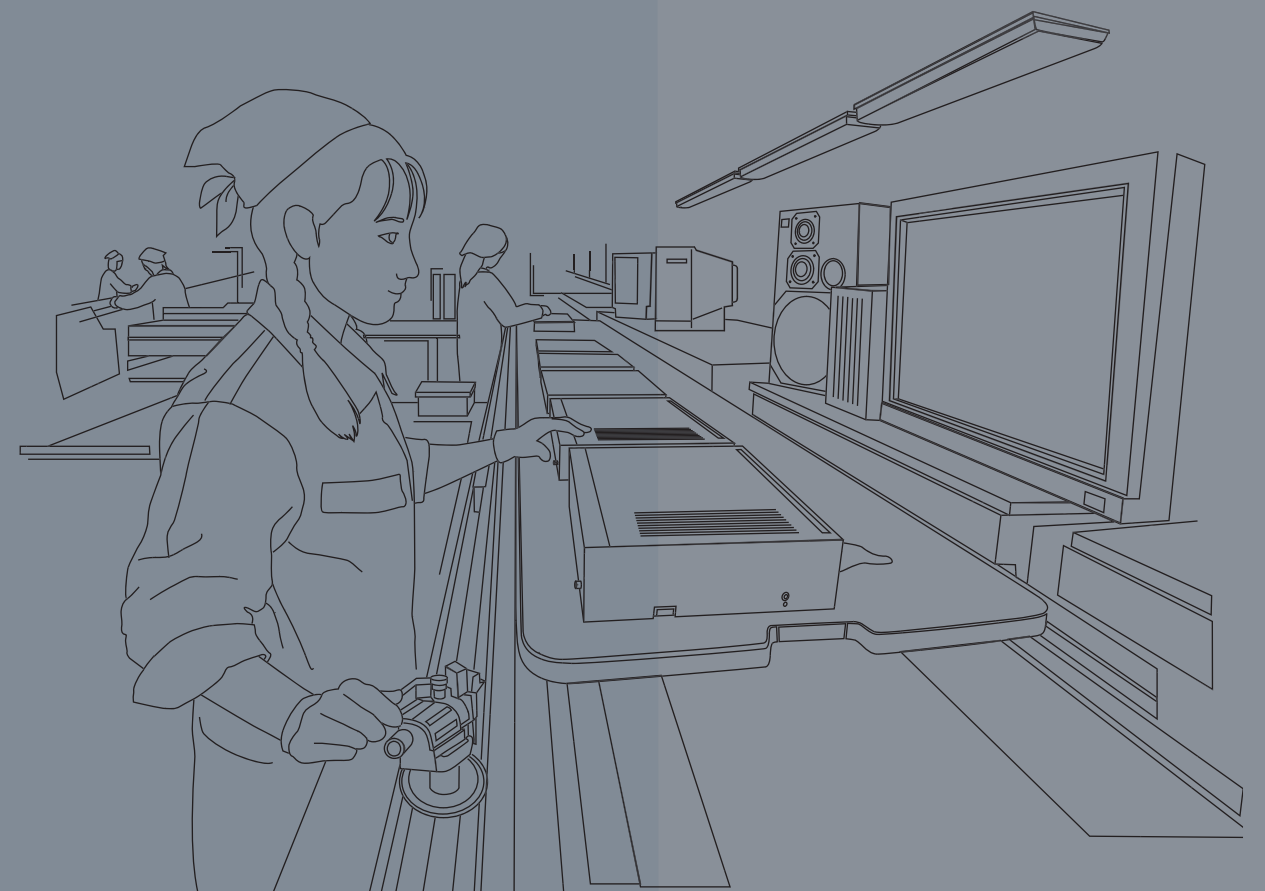
HK based companies set up a total of 21,300 Foreign Funded Enterprises (FFEs) in Guangdong. Another 32,000 Guangdong factories supported HK based companies in “Other Contractual Forms” (OCFs). Altogether they employed 10 million workers.

The rapid growth of producer services in HK is a consequence of industrialization across the border.

Guangdong factories working for HK companies



Guangdong
 FFEs : 21,300
 OCFs : 32,000



Information on Type IV companies that engage in pure subcontracting manufacturing activities for Hong Kong based companies is even more difficult to come by, even though it is believed that they are prevalent in Guangdong and are becoming even more so. Technically speaking, pure subcontracting arrangements are not foreign investments, but it is not atypical for the principal to take up a small share in the company of the subcontracted agent.

In light of the difficulty in obtaining information, we found it necessary to conduct a Part I survey to ascertain the true scale of Hong Kong-operated manufacturing activities in Guangdong. Our survey is limited to manufacturing and import-export companies registered in Hong Kong, as we believe these two sectors are by far the most important drivers of manufacturing production activities in the Mainland. Including import-export companies is therefore necessary to obtain a true picture of Hong Kong's manufacturing activities in China.

Supplementary Note

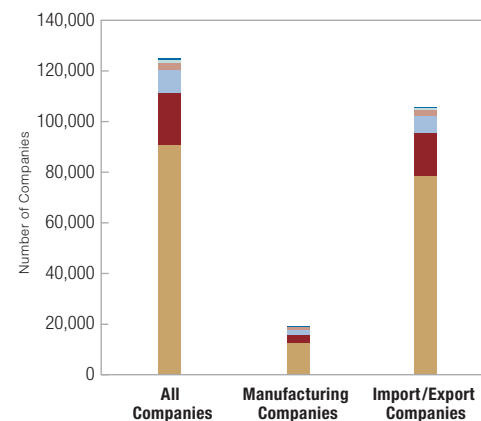
Part I Survey

Part I survey aims to ascertain the scale and nature of Hong Kong's manufacturing activities in Guangdong. A survey questionnaire was mailed out in April 2002 to all 122,809 establishments that were registered as either manufacturing or import-export companies in Hong Kong. In 2001, these companies engaged a total of about 664,000 workers in Hong Kong.

A total of 2,597 good records were returned with 30 percent being from manufacturing companies and 70 percent from import-export companies. Import-export companies were under-represented in the sample, as 84 percent of the establishments in our target population were import-export companies. The overall response rate was 2.1 percent and the corresponding rate for manufacturing and trading companies was 4.1 percent and 1.7 percent, respectively. To deal with the non-response bias, we relied on a logit model to estimate the probabilities of no manufacturing activity in Mainland China for the respondents, as well as for the non-respondents. These estimated probabilities of no activity were then used to control for non-response bias.

Part I Distribution of Manufacturing and Import-Export Companies by Employment Size

- 100 persons or more
- 50-99 persons
- 20-49 persons
- 10-19 persons
- 5-9 persons
- 1-4 persons



Source: Census and Statistics Department, HKSAR

2.2 The Scale of Hong Kong's Manufacturing Operations in Guangdong

A manufacturing or import-export company is defined as economically active in China if it (1) has invested in factory facilities in the Mainland, (2) has management and operation control of factory facilities, or (3) made subcontracted processing arrangement with foreign-invested or domestic companies.

It is estimated that a total of 63,000 companies representing 52.0 percent of all manufacturing and import-export companies had some kind of manufacturing activities in the Mainland (see Table 2.1). About 7,000 (35.0 percent) of these are registered as manufacturers in Hong Kong and 56,000 (55.0 percent) are registered as importers-exporters. A total of 27,000 companies (22.2 percent) have invested in factory facilities in the Mainland, 32,000 companies (26.2 percent) have management and operation control of factory facilities in the Mainland, and



¹The sampling distributions of the bootstrap replications, together with their summary statistics, are included in Appendix A. As expected, they are symmetric and can be approximated well by a Gaussian distribution. It has an estimated standard error of 1,400.

28,000 companies (23.2 percent) have made subcontracted processing arrangement with factories in the Mainland.

Outsourcing of production is not the dominant mode of production. Only 23.2 percent of the companies are estimated to have made subcontracted processing arrangement with factories in the Mainland. Both manufacturing and import-export companies engage in outsourcing activities, and some may have invested in factory facilities in the Mainland and may have management and operation control of factory facilities there as well.

2.3 Factory Facilities in Guangdong

Out of the total of 59,100 factory facilities that Hong Kong based companies had invested in and management control of in the Mainland, an estimated 53,300¹ was in Guangdong (see Figure 2.1). Hong Kong based companies invested in and had management control of a total of 21,300 factories in Guangdong as FFEs. A further 32,000 factories classified as OFIs or OTHs provided manufacturing operations for Hong Kong based companies. The "three forms of processing/assembly operations and compensatory trade" is the dominant form of OFIs.

Table 2.1: Estimated Number and Percentage of Companies by Economic Activities in the Mainland*

	Established Factory Facilities		Made Sub-contracted Processing Arrangements with Foreign Invested or Local Enterprises	Had Some Economic Activities in the Mainland	Had no Economic Activities in the Mainland
	Invested in Factory Facilities	Had Management and Operation control of Factory Facilities			
All Companies	27,000 22.2%	32,000 26.2%	28,000 23.2%	63,000 52.0%	60,000 48.0%
Manufacturing	3,000 13.9%	3,000 17.1%	3,000 16.9%	7,000 35.0%	13,000 65.0%
Import/Export	24,000 23.7%	29,000 27.9%	25,000 24.4%	56,000 55.0%	47,000 45.0%

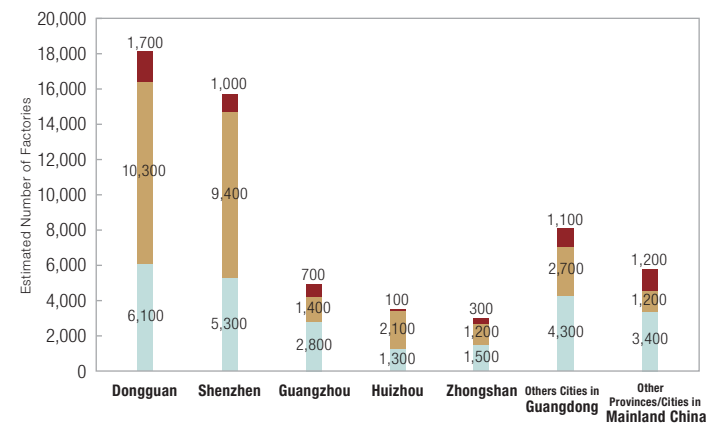
* The first three columns are not mutually exclusive because a company can be engaged in more than one type of economic activities in the Mainland

Guangdong is the most important production base for Hong Kong's manufacturing operations (see Figure 2.1). Dongguan, with 18,100 factories, has the highest estimated number of factories working for Hong Kong, followed by Shenzhen (15,700 factories), Guangzhou (4,900 factories), Huizhou (3,500 factories), and Zhongshan (3,000 factories). While the factories are mainly concentrated in these major cities, Hong Kong's manufacturing operations are also located in other parts of Guangdong, with an estimated 8,100 factories located elsewhere in the province.

The factory facilities are concentrated overwhelmingly in the eastern portion of the PRD. The heavy concentration in the eastern portion of the PRD is most likely related to the lack of a land access approach to the western portion of the province from Hong Kong. The prospect of constructing a bridge linking Hong Kong, Macao, and Zhuhai has been publicly raised by various parties in Hong Kong and has the support of the Hong Kong SAR Government. If such a bridge were to be constructed, then the scale of foreign investments, including those from Hong Kong, would increase significantly. This would reaffirm the fact that the Greater PRD is to remain China's foremost export-oriented manufacturing base for many years to come.

The heavy concentration in the eastern portion of the PRD is most likely related to the lack of a land access approach to the western portion of the province from Hong Kong.

Figure 2.1:
Estimated Number of Factories in Guangdong and Other Mainland Provinces/Cities



2.4 First Factory Facility in the Mainland

Hong Kong based companies began investing in Guangdong more than 25 years ago, but the pace started to pick up rapidly with China's opening. Figure 2.2 shows the percentage distribution by the year in which the first factory facilities were established in the Mainland. Among Hong Kong based companies that invested in factory facilities in the Mainland, only 3.7 percent had no facility in Guangdong, and only 2.5 percent had set up their first factories outside Guangdong.

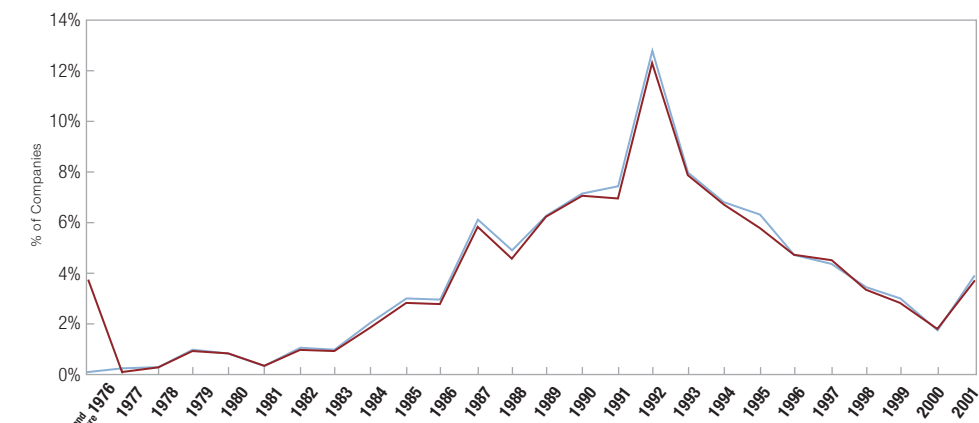
their first factories in Guangdong by 1976. Over time, more and more companies invested in factory facilities in the Mainland, with a peak in the investment occurring in 1992. During that year 12.8 percent of the companies set up their first factory facility in the Mainland. Even after 1997 there were new entrants, and altogether they accounted for 12.6 percent of the total number of companies with factory facilities in the Mainland. Among the new entrants, most entered in 2001, after a drop in 2000. The figures presented in Figure 2.2 suggest that the Mainland continues to be an attractive place for Hong Kong based companies to locate manufacturing operations, especially with China's accession to the World Trade Organization.

According to our survey, an estimated 3.8 percent of the companies in the target population had already set up

2.5 Number of Guangdong Workers

As of December 2001, an estimated 10 million Guangdong workers were working directly and indirectly on manufacturing operations for Hong Kong based companies. Around 4.75 million were working for FFEs. Another 5.04 million were engaged by OFI companies in manufacturing activities for Hong Kong based companies in "three forms of processing/assembly operations and compensatory trade".

Figure 2.2:
Percentage of Companies by Year of First Factory Facility



Dongguan² has highest estimated number of Mainland workers working for Hong Kong based companies with 4.03 million, followed by Shenzhen (2.58 million), Guangzhou (0.92 million), Huizhou (0.87 million), and Zhongshan (0.61million) (see Figure 2.3). An estimated 1.34 million workers were working for Hong Kong based companies in other parts of Guangdong.



² China's official figure for total manufacturing employees engaged by FFEs in Dongguan was 4.5 million, of which Hong Kong based companies engaged 2.66 million. The discrepancy may be partially accounted for by two things. First, in our study we use the concept of a Hong Kong based company, which China may not classify as a Hong Kong-owned company. Second, some Hong Kong based companies provide services to their Mainland factories that may be owned through their overseas parent company, (e.g., a British Virgin Island entity), and therefore again will not be classified as Hong Kong-owned company by China.

2.6 Hong Kong Based Staff and Indirect Employment Generation

In 2001, 63,000 Hong Kong based manufacturers and importers-exporters were economically active in the Mainland, and together they employed a total of 477,000 workers based in Hong Kong. These companies represent 52 percent of all registered manufacturers and importers-exporters in Hong Kong. For every employee engaged in Hong Kong, another 23.5 workers were engaged in the Mainland.

A total of 46,000 of these 63,000 companies had either invested in factory facilities or had management and operation control of factory facilities in the Mainland. In 2001, the companies with factory facilities in the Mainland employed a total of 389,000 workers in Hong Kong. The other 17,000 companies without factory facilities in the Mainland employed 88,000 workers in Hong Kong.

According to the survey findings, the number of Hong Kong based staff that

spent more than half of their annual working days in the Mainland were estimated at 88,000, which is 18.4 percent of all the employees employed by these 63,000 companies in Hong Kong. These individuals are effectively working full-time in the Mainland. Out of these 88,000 employees an estimated 83,000 worked in Guangdong. Therefore the number of Hong Kong based staff that works full-time or more than half time in Hong Kong will be less than the reported 477,000.

Staff employed by manufacturers and importers-exporters reflect the employment in Hong Kong that is directly generated by cross-border production operations and subcontracting activities. Indirect employment in Hong Kong is also generated by the demand created for allied and supporting industries. The full linkages are difficult to estimate, but it is

About 1.5 million HK jobs (43% of the labour force) are related to HK based companies' manufacturing activities in the PRD - half a million people are directly employed by these companies, and one million are employed in producer services linked to these activities.

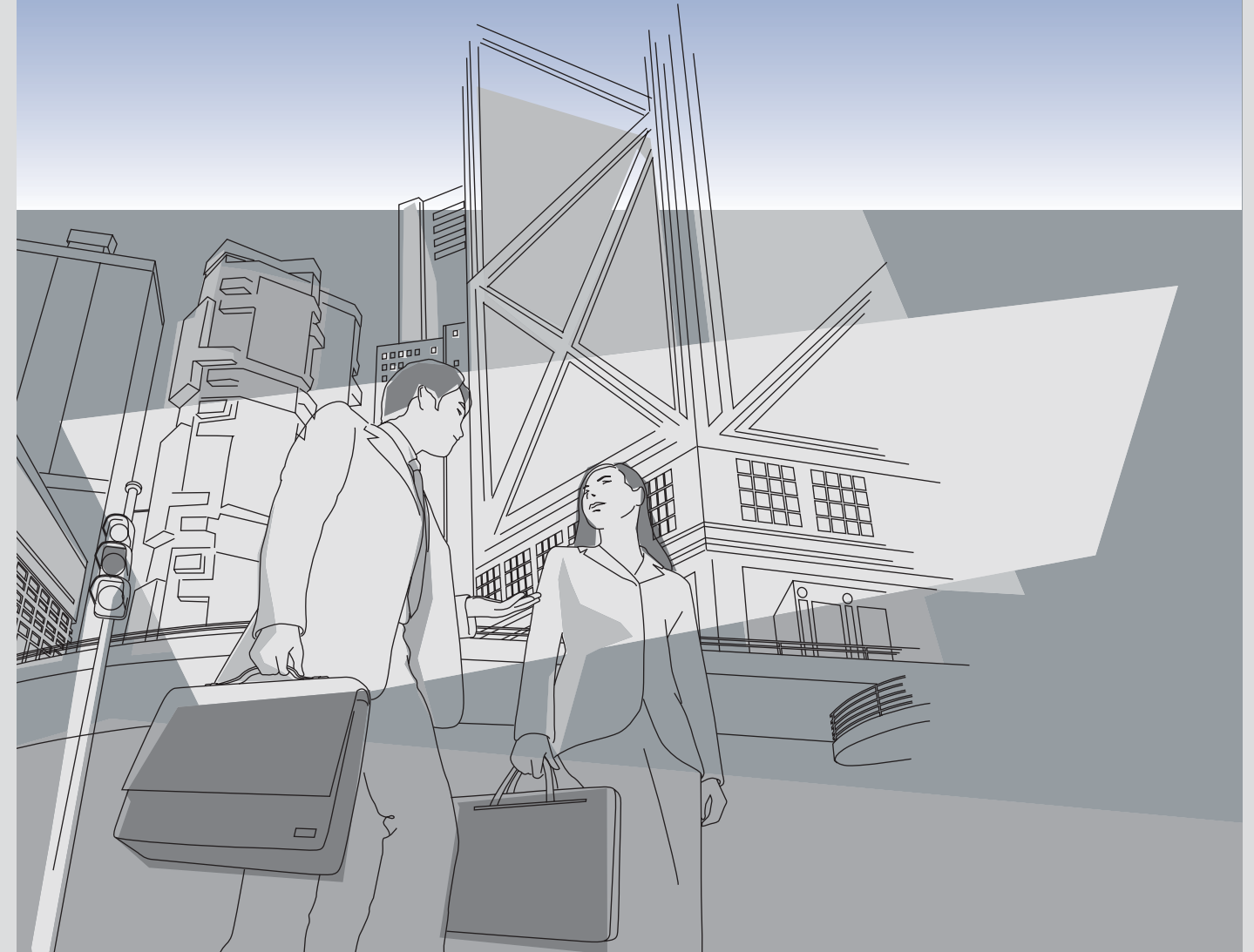
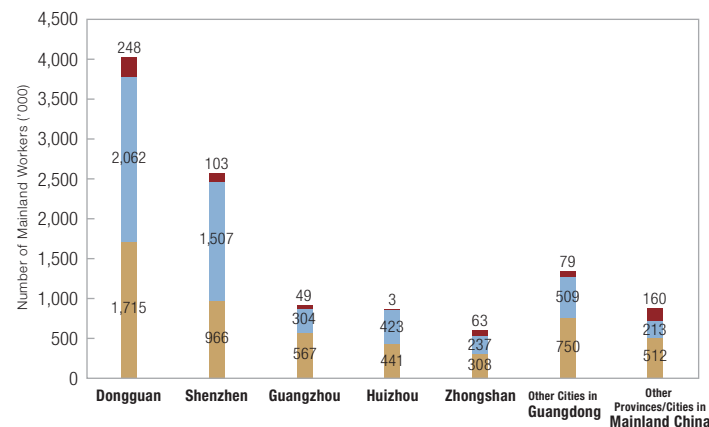


Figure 2.3:
Estimated Number of Mainland Workers

FFEs OFIs OTHs



possible to surmise that the increase in employment that has come about as a result of the rise of producer services since the mid-1980s is largely due to Hong Kong's growing manufacturing operations across the border. Based on an earlier study of producer services in Hong Kong by Wong, Tao, and Chan (2000) we are able to estimate that the number of jobs attributable to producer services may have been as high as 1.4 million at the end of 2002. After netting out jobs for importers-exporters, a total of 1.0 million jobs might be indirectly linked to cross-border manufacturing activities.³

³ YCR Wong, Z Tao, and CS Chan, *An Economic Study of Hong Kong's Producer Service Sector and Its Role in Supporting Manufacturing*, funded by Industrial Support Fund, Industry Department, Hong Kong SAR Government, May 2000 112 pages.

2.7 Export and Import Patterns

Destination of Output

On average, 71 percent of the output produced in Mainland factories with connection to Hong Kong was exported, 19 percent were transferred to other facilities for further processing, and 10 percent were used for domestic sales. An estimated 49.3 percent of the companies export 100 percent of their products made in the Mainland (see Table 2.2). The median company exports 99 percent of its products made in the Mainland. At the upper quartile, the number is 100 percent. These figures confirm the well-known fact that Hong Kong's manufacturing activities in the Mainland are highly export oriented.

We estimated that 49.3 percent of the companies exported all their output, 6.9 percent transferred all their output to other factories, and 2.5 percent sold all their output in the domestic market. We estimated that 7.6 percent of the companies were engaged in all three activities (i.e., exported their output, transferred their output to other factories, and sold their output in the domestic market).

Some companies engaged in two activities only: 17.7 percent both exported and transferred, 14.7 percent both exported and sold in the domestic market; and 1.3 percent both transferred and sold in the domestic market.

Table 2.2: Movement of Products Made in the Mainland

	% of Companies	Movement of Products (average value in %)		
		Exports	Transfer	Domestic Sales
Specialists				
100% Export	49.3%	100%	0%	0%
100% Transfer	6.9%	0%	100%	0%
100% Domestic Sales	2.5%	0%	0%	100%
Dual Roles				
Export & Transfer	17.7%	53.3%	46.7%	0%
Export & Domestic Sales	14.7%	62.6%	0%	37.4%
Transfer & Domestic Sales	1.3%	0%	68.0%	32.0%
All Three Roles				
Export, Transfer & Domestic Sales	7.6%	41.8%	33.7%	24.5%
Overall Weighted Average	100%	71.1%	18.6%	10.3%

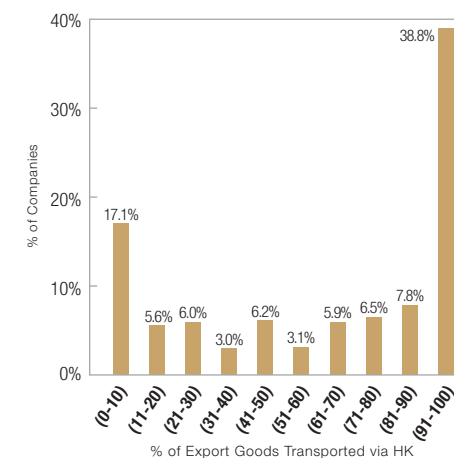
An estimated 10.7 percent of the factories did not export their products. Of such factories, 65 percent transferred all their output to other facilities for further processing, and 23 percent sold all their products in the domestic market.

Output Transported via Hong Kong

Most of Hong Kong's manufacturing products made in the Mainland are exported to the rest of the world via Hong Kong. As estimated 87 percent of the companies that exported their output made in the Mainland transported their exports via Hong Kong (see Figure 2.4).

In terms of output values, 38.8 percent of these companies exported 91-100 percent of their Mainland factories'

Figure 2.4: Percentage of Export Goods Transported via Hong Kong



output via Hong Kong. The median percentage of such output transported via Hong Kong was 80 percent.

Source of Input Materials

Most of the raw materials and semi-processed raw materials used in Hong Kong's manufacturing operations in the Mainland are imported either from Hong Kong or from other overseas markets. On average, 49.7 percent of the raw materials used in Mainland factories with connections to Hong Kong were imported, 16.7 percent were transferred from other factories in the Mainland, and the remaining 33.6 percent were sourced from other domestic suppliers (see Table 2.3).

The median factory imported 50 percent of its input materials, with the lower and upper quartile figures at 15 percent and 80 percent, respectively. Another important source of input material was domestic suppliers. An estimated 20 percent of the materials used in the median factory were supplied domestically. The least important source of input materials was other factories in the Mainland. This source of input materials accounted for less than 25 percent of the input materials for 75 percent of Hong Kong's manufacturing operations in the Mainland.

Table 2.3: Source of Raw Materials and Semi-Processed Raw Materials

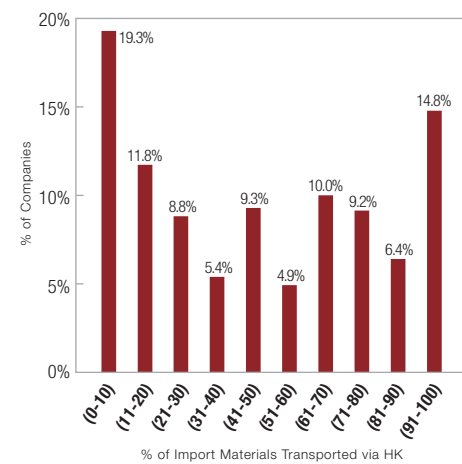
	% of Companies	Source of Raw Materials (average value in %)		
		HK and/or Overseas	Transfer	Domestic Suppliers
Single Source				
100% Transfer	2.0%	0%	100%	0%
100% Domestic Suppliers	9.7%	0%	0%	100%
100% HK and/or Overseas	12.5%	100%	0%	0%
Dual Sources				
Transfer & Domestic Suppliers	5.3%	0%	44.2%	55.8%
Transfer & HK and/or Overseas	11.8%	58.6%	41.4%	0%
Domestic Suppliers & HK and/or Overseas	34.9%	56.9%	0%	43.1%
All Three Sources				
Transfer & Domestic Suppliers & HK and/or Overseas	23.8%	43.9%	31.5%	24.6%
Overall Weighted Average	100%	49.7%	16.7%	33.6%

It was estimated that 12.5 percent of these companies sourced their raw materials only from Hong Kong and overseas, 9.7 percent sourced only domestically, and 2.0 percent sourced only from other factories in the Mainland. About 24 percent of the companies obtained their raw materials using three different sources: other factories via transfers, domestic suppliers, and Hong Kong and overseas.

Some companies sourced their input materials from two different places; 34.9 percent sourced both from domestic suppliers and from Hong Kong and overseas; 11.8 percent sourced both from other factories via transfers and from Hong Kong and overseas; and 5.3 percent sourced both from other factories via transfers and from domestic suppliers.



Figure 2.5:
Percentage of Import Materials Transported via Hong Kong



Input Materials Imported via Hong Kong

An estimated 78 percent of the companies that imported their raw materials used in Mainland factories imported via Hong Kong. On average, in terms of value, the percentage of such imported materials transported via Hong Kong was 50 percent in 2001 (see Figure 2.5). The median figure is 50 percent, and more than 80 percent of the imported inputs used in 75 percent of the factories were imported via Hong Kong. Some companies transported all imported raw materials via Hong Kong; 14.8 percent of the companies imported 91-100 percent of their raw materials using Hong Kong ports.

Table 2.4: Movement of Products and Source of Raw Materials by Type of Investment

	% of Companies	Destination of Products (average value in %)			Sources of Raw Materials (average value in %)		
		Exports	Transfer	Domestic Sales	HK and/or Overseas	Transfer	Domestic Suppliers
FFEs only	33.1%	66.6%	17.0%	16.4%	51.8%	13.6%	34.6%
OFIs only	44.7%	67.3%	26.6%	6.1%	57.5%	24.3%	18.2%
OTHs only	7.4%	62.3%	13.8%	23.9%	34.9%	9.0%	56.1%
FFEs & OFIs only	10.8%	75.4%	14.0%	10.6%	61.5%	14.3%	24.2%
FFEs & OTHs only	1.3%	60.0%	28.9%	11.1%	41.9%	5.7%	52.4%
OFIs & OTHs only	0.8%	64.1%	14.5%	21.4%	54.7%	7.9%	37.4%
FFEs & OFIs & OTHs	1.9%	80.9%	8.1%	11.0%	46.3%	7.7%	46.0%
Total	100%	67.7%	20.7%	11.6%	53.9%	17.8%	28.2%

2.8 Destination of Products and Source of Input Materials by Type of Foreign Investment

An interesting question is whether the sources of input materials used by Hong Kong operated factories in the Mainland and the destinations of their output vary depending on whether the company is a FFE, OFI, or OTH. Table 2.4 provides percentage breakdowns on destinations of output and sources of input materials by the type of foreign investment that Hong Kong based companies set up in the Mainland.



The majority of the Hong Kong based companies that operate factory facilities in the Mainland exported about 60-70 percent of their products to Hong Kong or overseas markets. These included

FFEs, OFIs, and OTHs. Their differences are reflected primarily in variations in the proportion of their products that were destined for transfer to other companies and for domestic sales.

We found a relatively small proportion of OFIs' output is sold on the domestic market, and a relatively small proportion of their input materials are sourced from domestic suppliers. This finding is consistent with the casual observation that "three forms of processing/ assembly operations and compensatory trade" are relatively simple operations whereby raw materials were imported and finished goods were exported. A relatively large proportion of OFIs' output is also transferred to other factory facilities for further processing or for input materials from other factory facilities. OFIs were more reliant than FFEs and OTHs in overseas markets for both output and input materials.

By contrast, a larger proportion of OTHs' output was sold in the domestic market, and a large proportion of their input materials were sourced from domestic suppliers. In this sense they are similar to domestic companies.

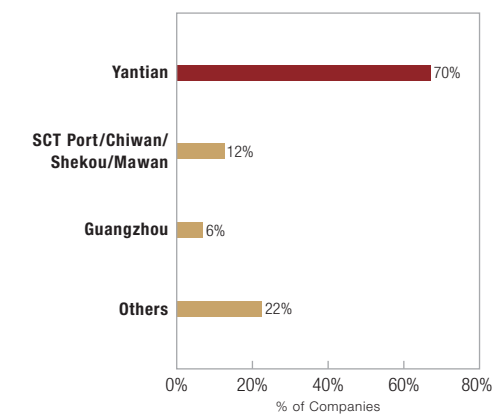
2.9 Transportation of Goods

Our findings based on a subsequent Part II survey (which is described in detail in chapter 3) investigated a number of questions related to the transportation of goods. We examined (1) the Mainland ports that were most often selected by Hong Kong based companies to ship their goods, (2) the major reasons for their choice of ports, (3) the frequency and incurred financial loss due to traffic congestion and customs delays while transporting goods across the Hong Kong and Shenzhen border; and (4) the likely future choice of transportation mode for their exports in the coming one to two years.

We found that 70 percent of the companies with factories or management and operation control of factory facilities in Guangdong had chosen Yantian, in addition to Hong Kong, to ship their products. About 22 percent of the companies had chosen other ports, such as ports in Shanghai and Ningbo, to ship their products.



Figure 2.6:
Use of Mainland Ports





The most important factor for the choice of port was overseas buyers' requests, which 50 percent of the companies surveyed indicated as their first priority. Transportation costs was the second most important factor, and total transportation time was the third most important.

In 2001, 64 percent of the companies experienced incidents of and incurred financial loss caused by traffic congestion and customs delays while transporting goods across the Hong Kong and Shenzhen border. The financial loss might be due to the use of airfreight to avoid missing delivery deadlines or to cancellations of orders by overseas buyers. A reported 73.4 percent of those companies experienced one to five such incidents, and 26.6 percent experienced six or more incidents in that year. The financial loss incurred as a result such incidents ranged from a minimum of HK\$3,000 to a maximum of HK\$4 million. The median value of the financial loss was HK\$100,000.

In the coming one to two years, about 37 percent of the companies indicated that more goods would be shipped from Mainland ports. Another 37 percent indicated that the present shipping pattern would not be changed. Only 11 percent indicated that more goods would be shipped via Hong Kong ports.

Figure 2.7:
Traffic Congestion or Customs Delays whilst Transporting Goods across the Hong Kong/Shenzhen Border in the Past Year

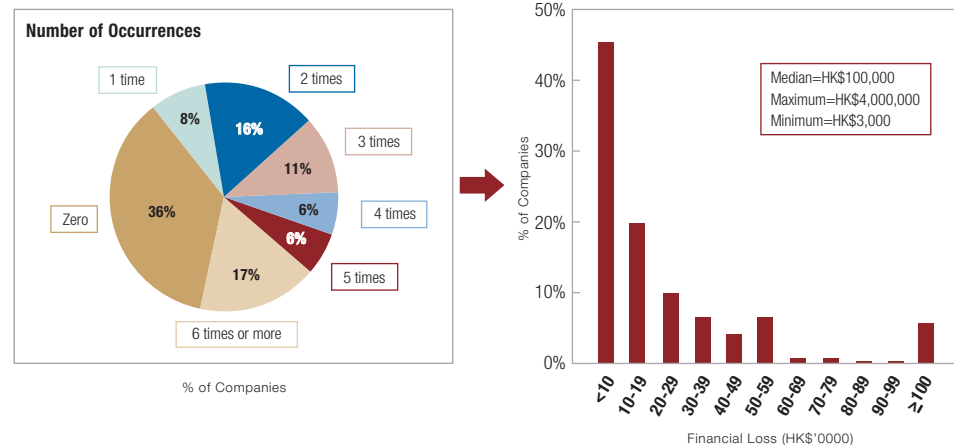
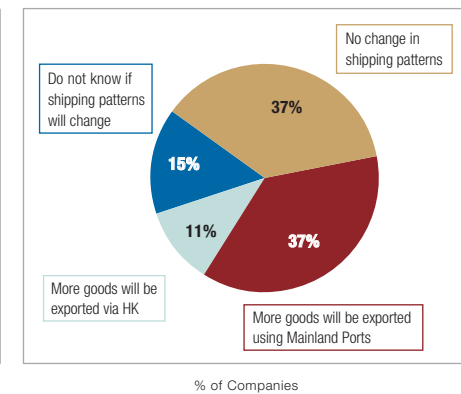


Figure 2.8:
Change in the Export Mode of Goods Produced in the Mainland over the Next One to Two Years



Chapter 3

An Evolving Partnership - Guangdong and Hong Kong

3.1 Division of Labour

The enormous scale of Hong Kong's manufacturing operations in Guangdong described in chapter 2 implies that the partnership between Guangdong and Hong Kong is both broad and deep. The partnership has always been popularly described as a "front-end shop and back-end factory" relationship. As is well known, the partnership began when Guangdong started to open to the rest of the world through the liberalization of its economy. Companies in Hong Kong began to take advantage of the low cost of labour and land across the border by expanding and shifting their manufacturing operations there. The marketing and financial prowess of Hong Kong nurtured in a free market environment made it the ideal place to locate headquarter functions to manage production operations in Guangdong. Working together, the two localities created a formidable powerhouse in export-oriented manufacturing.

The partnership made it possible for Hong Kong companies to expand their operations in many ways, to attract foreign companies to the region, to start new businesses, and to help Guangdong industrialize at an explosive pace. Immigrants from all over the

Mainland flocked to Guangdong, bringing skills and talent that contributed to creating one of the fastest-growing provinces in the Mainland. The partnership is still evolving today, as more high value-added activities, including management, logistics, research and development, and sales, continue to expand in Guangdong. The division of labour has continued to evolve as well, with implications for Hong Kong. As the business environment in

Guangdong improves, more functions now located in Hong Kong are likely to be shifted across the border. We have conducted a Part II survey and an in-depth Part III interviews to learn about Hong Kong companies' perception of the business environment in Guangdong and the future role of Hong Kong as a centre for managing manufacturing activities in Guangdong.

Supplementary Note

Part II Survey

Our target population in the Part II survey consisted of the 1,109 companies that had operated or control of factory facilities in Guangdong Province obtained in the Part I survey. The second questionnaire was sent to these companies in November 2002. A total of 481 forms were collected and yielded an overall response rate of 43.4 percent. From the following figure we observe that the distribution of companies by employment size in the sample and in the target population are very similar. The sample can be considered as a random sample of the population.

Part III Interviews

We also interviewed 21 Hong Kong manufacturers in the period April 2002 – December 2002 to study in greater detail the operational issues faced by Hong Kong manufacturers in Guangdong and to gain information about their assessment of the business environment there to supplement the information gathered in the Part II survey. We met with 18 medium-sized and large manufacturers who were members of the Federation of Hong Kong Industries and with three small and medium-sized companies chosen from the Part I survey.

Legend: 1-9 (orange), 10-19 (light blue), 20-49 (medium blue), 50-99 (grey), 100 or more (red)

Employment Size	Population (%)	Sample (%)
1-9	55.4%	59.1%
10-19	17.0%	16.0%
20-49	15.9%	13.4%
50-99	7.5%	6.4%
100 or more	4.2%	5.1%

3.2 Reasons for Moving Operations and Production to Guangdong

Our survey identified five major reasons for moving manufacturing operations and production to Guangdong. The most important reason was to reduce labour costs; this factor was ranked first by 63.5 percent of the companies surveyed and was chosen as one of five key reasons by almost all the companies (see Figure 3.1). The two next most important reasons were to reduce rental/land costs and to scale up production. All other factors were rated significantly lower than these top three factors. Moving closer to customers and business partners, and exploiting domestic sales opportunities were rated fourth and fifth.



3.3 Business Operations in Hong Kong and Guangdong

According to our Part II survey, Hong Kong companies operating in Guangdong today are predominantly financial management offices, regional headquarters, sales and marketing offices, and information technology (IT) management offices (see Figure 3.2). Around 80 percent of the companies indicated that their Hong Kong offices were performing financial management functions and were serving as regional headquarters. About 76 percent indicated that their Hong Kong offices primarily carried out sales and marketing activities. Production, storage, and transportation activities were carried out primarily in Guangdong. Approximately 83 percent of the companies indicated that production was carried out primarily in Guangdong. And 51 percent of the companies indicated that storage and transportation were carried out primarily in Guangdong.



Around 40 percent of the companies indicated that procurement of materials and R&D were carried out primarily in Hong Kong. Around 20-30 percent of the companies were using Hong Kong and Guangdong equally to perform these two functions. About 26 percent of the companies' procurement of materials and about 33 percent of their R&D was carried out primarily in Guangdong.

Will the current division of labour between Hong Kong and Guangdong with respect to these different functions continue into the future? Our Part II survey findings reveal that at least half of the companies surveyed indicated that functions relating to regional headquarters, financial management, sales and marketing, IT management,

procurement of materials, R&D, storage and transportation, and production in Hong Kong would not change in the next two to three years (see Figure 3.3). However, with the exception of financial management, more than half of the companies indicated that they would increase all these activities in Guangdong.



On the other hand, the proportion of surveyed companies that plan to reduce their activities in procurement of materials, storage and transportation, and production in Hong Kong was 42 percent, 37 percent, and 35 percent, respectively. Moreover, less than 10 percent of the companies indicated that they would increase these activities in Hong Kong. These findings show that it is highly likely that more manufacturing activities will be transferred to Guangdong.

In conclusion, most companies will keep their present scale of financial management, regional headquarters, sales and marketing, and IT management in Hong Kong. A significant proportion will move their procurement of materials, storage and transportation, and production to Guangdong. According to our survey, most companies indicated that they would further expand all the above activities in Guangdong in the next two to three years.

3.4 Domestic Sales

Some 66.7 percent of the companies surveyed responded that they did not sell their products in the domestic market (see Figure 3.4). Within this group of companies 60.4 percent had no domestic sales activities at the time of the survey, but they had plans to engage in such activities. The remaining 39.6 percent had no plans to engage in domestic sales activities in the Mainland.

Some 33.3 percent of the companies surveyed sold their products in the domestic market. Within this group, 71.8 percent indicated that they planned to increase the level of their domestic sales in the future, 27.0 percent indicated they had no plans to change the level of their domestic sales, and 1.2 percent indicated that they planned to reduce the level of their domestic sales.



Figure 3.1:
Top Five Reasons for Moving Production Operations to Guangdong

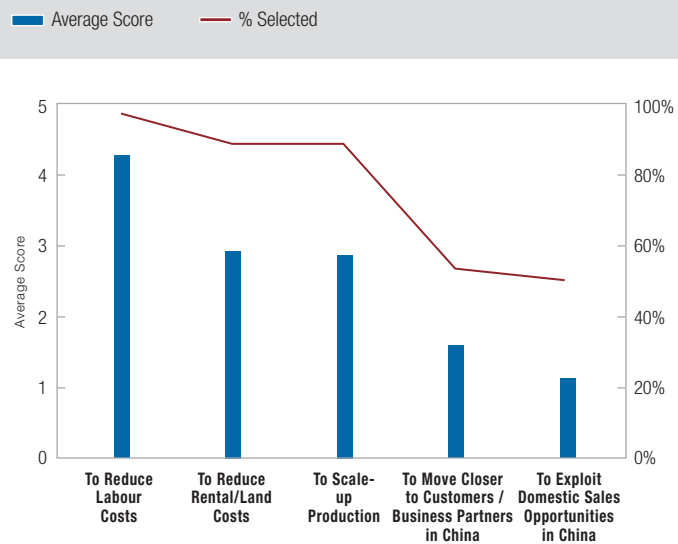


Figure 3.2:
Choice of Location for Different Business Operations

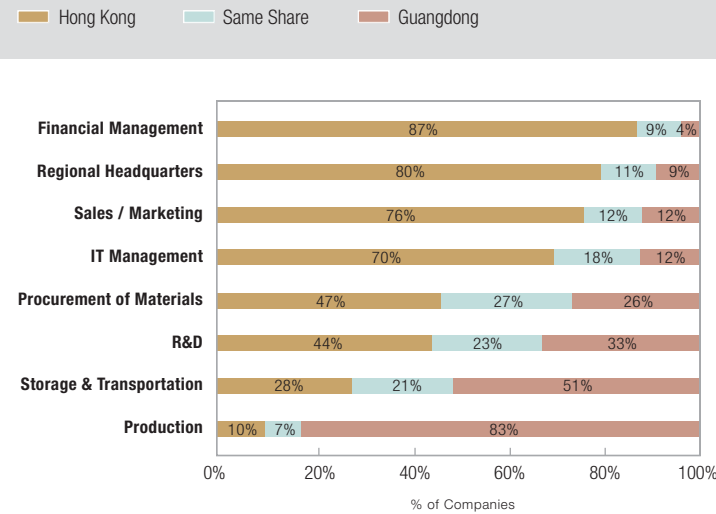


Figure 3.3:
Location of Different Business Operations in the Next 2-3 Years

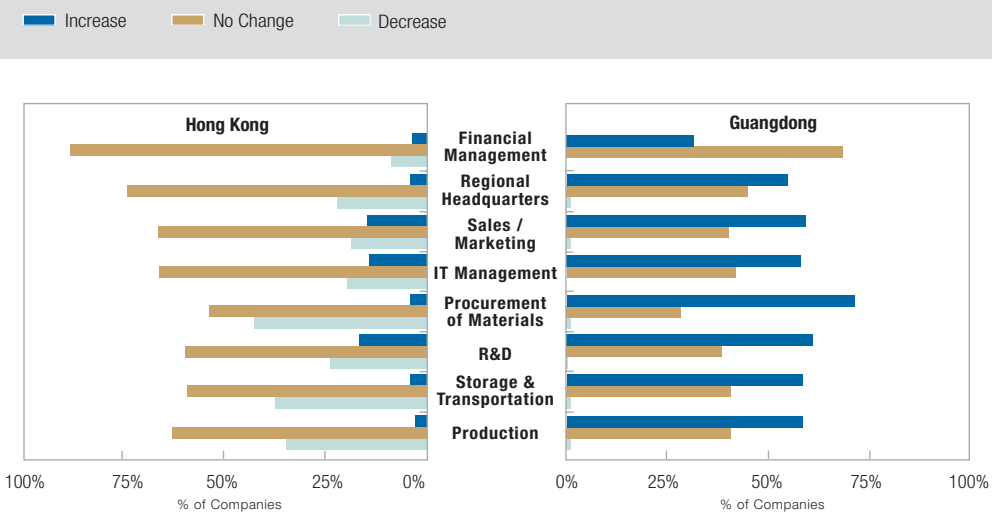
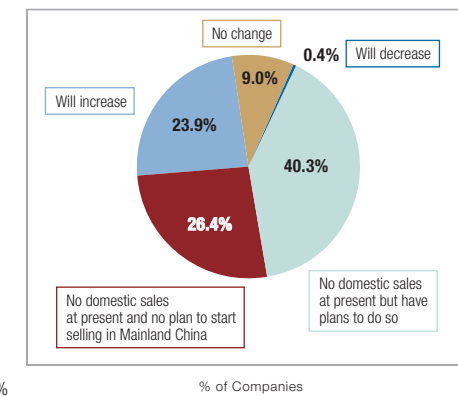


Figure 3.4:
Change in Domestic Sales in the Next 1-2 Years



Most of the companies surveyed indicated that they were interested in engaging in or increasing the level of domestic sales in the Mainland. From our in-depth interviews, we learned that collecting money from agents was one of the companies' major business concerns. One large company that sold brand-name products had developed a credit monitor system to monitor the payment records of different agents and had applied different credit policies to each based on their payment track records. A small company had employed a money-collection agent in Shenzhen, which was able to collect money effectively all over the country.

Supplementary Note

Money Collection Using Agents

The difficulty of collecting money in the Mainland creates a barrier for many investors. After years of experimentation, one interviewed company found an effective way to solve this problem. The company entrusted large trading agencies in the Mainland as its sole agents and made use of the agencies' broad business networks to penetrate the domestic market. More important, the agencies have the ability to collect money throughout the country. Therefore, cooperating with the agencies makes money collection much easier for Hong Kong investors. Up to now, the company still maintains a cooperative relationship with its agents.

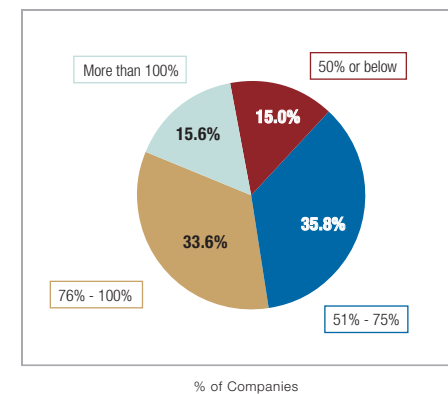
3.5 Relative Productivity of Mainland Workers Employed in Guangdong

According to the surveyed companies, the average productivity of Mainland workers employed in Guangdong factories is about 75 percent of that of Hong Kong workers (see Figure 3.5). About 15 percent of the companies indicated that relative productivity of Mainland workers was around 50 percent or below that of Hong Kong workers. But 15.6 percent of the companies indicated that relative productivity was more than 100 percent. An estimated 35.8 percent of the companies indicated that the relative productivity of Mainland workers was between 51 percent and 75 percent, and another 33.6 percent of the companies indicated that it was between 76 percent and 100 percent. These are of course perceptions rather than actual measured productivity changes. To a large extent most of the jobs filled in Guangdong today are no longer performed in Hong Kong, hence,

the perception may well reflect differential productivity associated with different types of jobs that are filled on the two sides of the border rather than strictly comparing like with like. We gathered a clear perception based on some of the interviews with individual companies that when comparing like with like Guangdong workers were on average as productive as Hong Kong workers, if not more.



Figure 3.5: Relative Productivity of Mainland Workers (Benchmarked against Hong Kong employees)



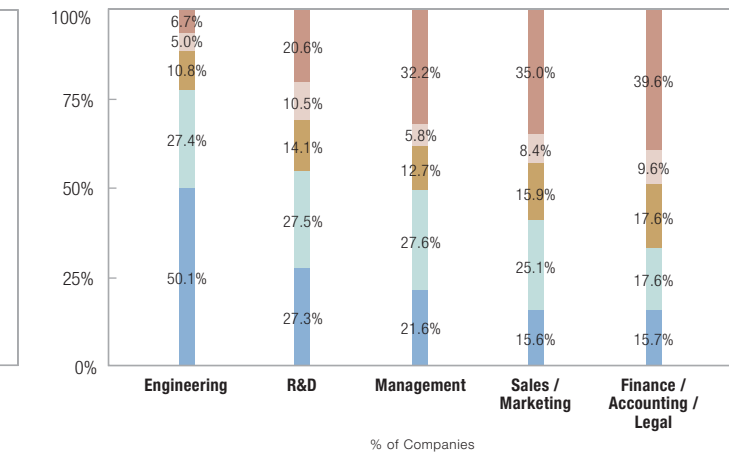
3.6 When Will Mainland Workers Replace Hong Kong Workers in Guangdong?

The companies' estimations of the extent to which and the rate at which Hong Kong workers in Guangdong factories will be replaced by Mainland workers varied with the workers' job functions (see Figure 3.6). Only a small proportion of the companies indicated that they did not know when Mainland workers would replace Hong Kong workers. About 50 percent to 75 percent of the companies expected that eventually Mainland workers would replace most of their Hong Kong workers in Guangdong.

About 50 percent of the companies indicated that Mainland workers had already replaced their entire engineering staff. An estimated 27.3 percent and 21.6 percent of the companies indicated that their entire R&D staff and their entire management staff, respectively, had already been replaced by Mainland workers.

Figure 3.6: Time Anticipated for Hong Kong Employees to be Replaced by Mainland Workers in Guangdong

- No Intention to Replace All HK Staff by Mainland Workers
- Do Not Know
- More than 5 Years
- Within 5 Years
- Have Already Been Fully Replaced



There will be a shift in the balance of the division of labour in Greater PRD towards Guangdong overtime; however, companies will retain their regional headquarters in Hong Kong.



Interestingly between 18 percent and 28 percent of the companies indicated that their Hong Kong workers in engineering, R&D, management, sales and marketing, and finance-accounting-legal functions would all be replaced by Mainland workers within five years. This suggests a more rapid transition to using local workers in Guangdong for higher value-added tasks than was previously possible. Using the estimate of 83,000 Hong Kong based workers that spend more than half of their working days in Guangdong that we obtained in the Part I survey, one could surmise, in the absence of scaling up of production across the border, that a possible 20,000 job opportunities for Hong Kong workers could be lost in the next five years. In making these simplistic projections we have not factored in the possibility of enhanced productivity requirements that would require the companies to hire Hong Kong based workers, provided that these workers meet those requirements.



Supplementary Note

Business Operations in Hong Kong and the Mainland

Case 1

Precision molding is a high value-added industry with high technological requirements. We interviewed a molding company that had retained its workshop in Hong Kong employing 50 workers, as well as 60 percent of the machinery and equipment to handle complicated and core production processes. Its Dongguan factory has 100 workers that handle primarily the labour-intensive processes. The Hong Kong headquarter office controls all functions, including financial management, sales and marketing, storage and shipping management, R&D, and some production, while the Dongguan factory is only responsible for part of the production.

Although Hong Kong managers manage the Dongguan factory, the company is training locals to assume management roles in a few years. The company believes that Mainland workers will be able to replace Hong Kong workers in the future because of the presence of a larger pool of talent there and their lower salaries. For example, the average salary of Mainland technicians is five to six times lower than a comparable salary in Hong Kong, and that of senior managers is three times lower.

Case 2

We interviewed another company that produced electronic home appliances and that had moved its plant to Dongguan in the early 1990s. The company employed 1,500 Mainland workers. The company's Hong Kong headquarters are responsible for all functions except production.

In the face of cost/budget pressures, the company had downsized its Hong Kong office from 80 to 60 employees in the last two years. The factory in Dongguan is still managed by Hong Kong staff, but Mainland managers now occupy its middle management positions.

In 1996, the company set up its second plant in Shanghai to produce its own brand-name products for the domestic market. The company appointed a Shanghainese as the general manager of the Shanghai factory because local managers were much more familiar with aspects of the domestic market such as sales methods and business networks.

3.7 Business Environment in Guangdong

In our survey, we evaluated performance in four areas relevant to the state of the business environment in Guangdong. These areas are (1) government policies, (2) production operations, (3) infrastructure and supporting services, and (4) legal protection. We used 22 indicators to measure the degree of satisfaction in these four areas using a score of one to five, with one indicating unsatisfied and five indicating satisfied (see Figure 3.7). Average scores for each indicator and for each of the four areas were calculated. Lower average scores reflected a lower degree of satisfaction on the part of the companies. Higher average scores reflected a higher degree of satisfaction.

In these four areas, the most satisfactory one was infrastructure and supporting services, which received an average score¹ of 3.25. The second most satisfactory was production operations, which received an average score of 3.19. The least satisfactory areas were government policies and legal protection, which received average scores of 2.52 and 2.43, respectively. Most of the surveyed companies indicated that most indicators in these four areas had improved or significantly improved in Guangdong within the preceding three years (see Figure 3.8).

¹ Average score is the simple average of the scores of all respondents in each area.

Figure 3.7: Perceptions of the Business Environment in Guangdong

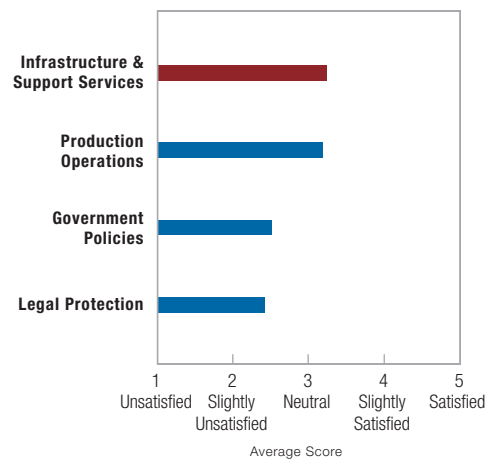
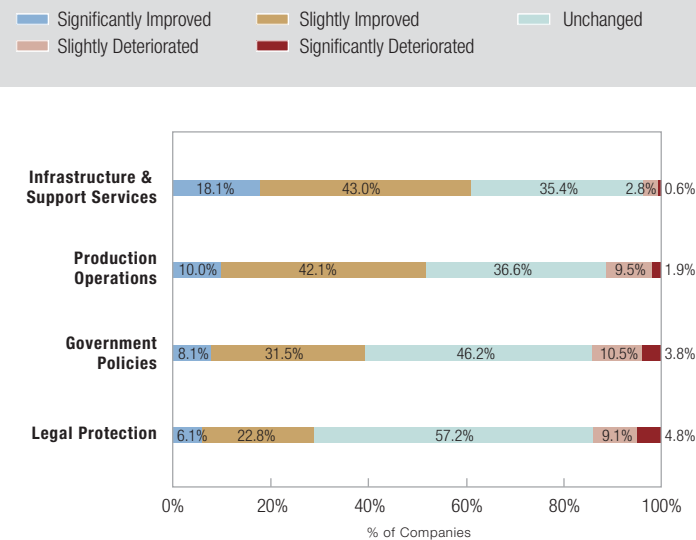


Figure 3.8: Changes in the Business Environment over the Past 3 Years in Guangdong



Supplementary Note

Business Environment in Guangdong Improving

A shoe producer, who has been operating in Guangdong since 1984, witnessed the change in the business environment in Guangdong over the past 20-odd years. In the mid 1980s, when the company moved its plant to Huizhou, Guangdong, the environment was very bad; there were shortages of water and electricity, poor transport infrastructure and telecommunications services, and ignorant and troublesome government officials, and so forth. The company had to spend a lot of time and resources to deal with these problems.

After years of development, China's infrastructure has improved remarkably. Considering that China is still a developing country, the company thinks that government-related matters have reached an acceptable level. Government officials are younger and better educated than before. The government is making good progress in terms of efficiency and transparency. The company usually tries to build a good relationship with the local government so that it can resolve problems or disputes when they arise. The company has never tried to solve problems through the judiciary system in the Mainland because it views the procedures involved as prolonged and ineffective.

Government Policies

Seven indicators were selected to measure whether government policies contributed to improving the business environment in Guangdong (see Figure 3.9). These indicators included (1) access to information on government policies and regulations, (2) customs policies, (3) customs operations and practices, (4) labour laws, (5) tax policies, (6) foreign exchange policies, and (7) investment incentives.

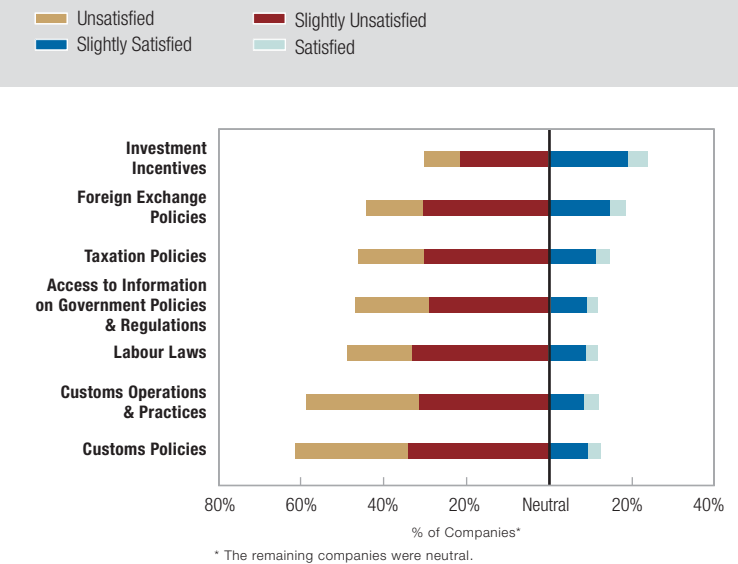
Between 20 percent and 60 percent of the companies indicated that they had perceived either "improvement" or "significant improvement" in various government policies in Guangdong within the preceding three years. Nevertheless, only 10-24 percent indicated that they were "slightly satisfied" or "satisfied" with the government policies in Guangdong during the survey period. Most Hong

Kong based companies remained dissatisfied with government policies in Guangdong.

About 61 percent and 58 percent of the companies, respectively, indicated they were "slightly unsatisfied" or "unsatisfied" with customs policies, and customs operations and practices in Guangdong. Within the preceding three years, some 47-49 percent of the companies thought that there had been "some improvement" in these areas. However, 40-43 percent thought that there had been no change during that period.

In other areas of government policy, such as labour law, tax policies, foreign exchange policies, and investment incentive measures, most of the companies were "neutral" or "unsatisfied". About 50 percent of the companies felt that there had been "no improvement" in these policies within the preceding three years.

Figure 3.9: Assessment of Government Policies in Guangdong



The only exceptional finding was in the area of “access to information on government policies and regulations”. About 60 percent of the companies indicated that there had been “some improvement” within the preceding three years. However, the companies’ degree of satisfaction remained low.

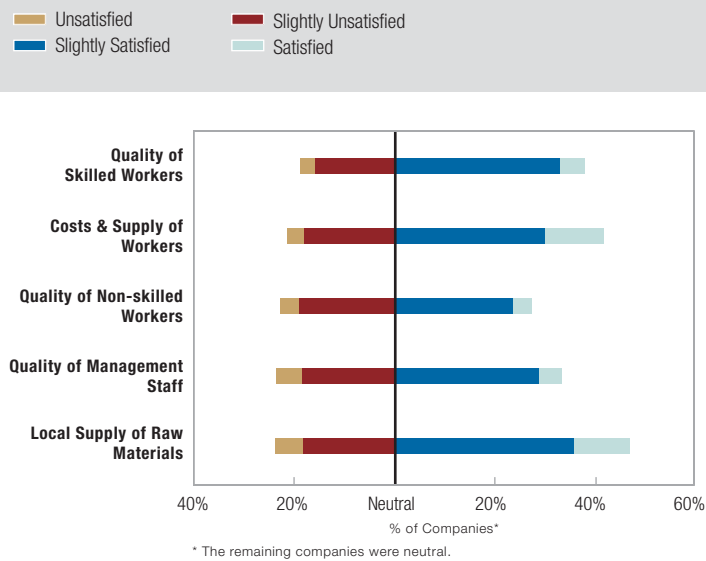
Production Operations

Five indicators were selected for the area of production operations (see Figure 3.10). They included (1) costs and supply of workers, (2) quality of management staff, (3) quality of skilled workers, (4) quality of non-skilled workers, and (5) local supply of raw materials.



In general, most of the companies were “neutral” or “satisfied” with production operations in Guangdong. About 40 percent were “neutral,” and another 40 percent were “slightly satisfied” or “satisfied”. Only around 20 percent of the companies indicated that they were “not satisfied”. Almost all of the indicators in production operations (e.g., quality of management staff, quality of skilled workers, quality of non-skilled workers, local supply of raw materials) were perceived to have “improved” or “significantly improved” within the preceding three years. It is not surprising that the “costs and supply of workers” was perceived to have deteriorated, in light of the increasing demand for workers in Guangdong as the economy developed.

Figure 3.10: Assessment of Production Operations in Guangdong



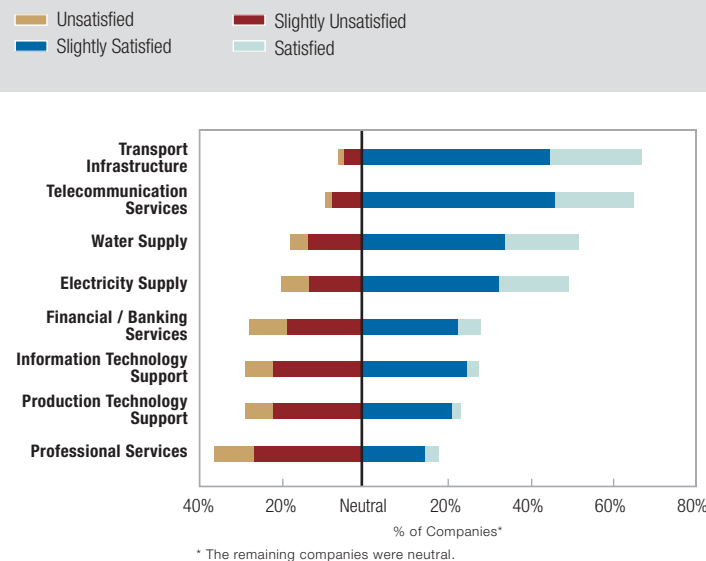
Infrastructure and Support Services

Eight indicators were selected for the area of infrastructure and support services (see Figure 3.11). Infrastructure and support services included (1) electricity supply, (2) water supply, (3) transport infrastructure, (4) telecommunication services, (5) financial and banking services, (6) production technology support, (7) information technology support, and (8) professional services.



In the area of infrastructure and support services, the degrees of satisfaction with electricity supply, water supply, transport infrastructure, and telecommunication services scored the highest among all four areas. Only 20 percent of the companies felt “slightly unsatisfied” or “unsatisfied” with infrastructure-related factors in Guangdong.

Figure 3.11: Assessment of Infrastructure and Support Services in Guangdong



Supplementary Note

Protection of Intellectual Property Rights Needs Strengthening

A food company that hires only 20 people in the Mainland and has its own brand name for domestic sales there had to spend as much as HK\$1 million to fight pirated goods each year. Pirated goods are everywhere, and it is very difficult to prevent piracy in the Mainland.

First, local governments often protect producers of pirated goods, making it difficult to prevent piracy.

Second, local and provincial departments in the Mainland often operate independently, making it very hard to combat piracy across regional boundaries.

Third, it is difficult to claim damages and seek remedy through legal channels. According to the prevailing laws in China, victims have to demonstrate the amount of profits made by producers of pirated goods to claim damages and seek remedy. But the amount refers only to the profits made by producers of pirated goods through their sales and does not include the value of unsold goods stored in warehouses. Victims can at most seize the pirated goods in the production plants but can hardly trace the profits made through sales. As a consequence, they usually cannot be compensated.

After having combated pirated goods for years, the company succeeded only once in claiming RMB 1 million in damages. Having failed so many times, the company decided to stop trying to eliminate all pirated goods. Instead, it devotes a certain amount of resources each year to keeping piracy from going too far.

Legal Protection

Honouring commercial contracts and protection of intellectual property rights were used as the two indicators of legal protection. Protection of intellectual property rights scored the lowest among all the indicators in all four areas (see Figure 3.12). About 58 percent of the companies were “unsatisfied” with the protection of intellectual property rights in Guangdong. Around 40 percent were “not satisfied” with honouring of commercial contracts in Guangdong. Some 60 percent indicated that the situation had remained “unchanged” in the preceding three years.

3.8 Disputes in Guangdong

Almost all the problematic issues facing companies operating in Guangdong were related to government policies. The five most problematic issues were (1) customs and import-export regulations, (2) customs commodity transfer regulations, (3) collection of various fees and charges by local government agencies, (4) labour regulations, and (5) foreign exchange regulations (see Figure 3.13). All these factors are directly related to government policies in Guangdong.

Companies were asked to score on a scale of 1 to 5 the extent to which an issue was problematic. A higher score implies a more problematic issue and a lower score implies a less problematic issue. The three issues that received the highest average scores were “customs and import-export regulations”, “customs commodity transfer regulations”, and

“collection of various fees and charges by local government agencies”. These issues were considered the most problematic issues in Guangdong by more than 80 percent of the companies.

It is interesting to note that less than 25 percent of the companies identified “disputes with local suppliers”, “disputes with local distributors”, or “labour disputes with their own factory workers” as problematic issues.

Almost all the problematic issues facing companies operating in Guangdong were related to government policies.

In the preceding two years, 48 percent of the companies had engaged in some form of disputes in Guangdong. Among the companies that had engaged in disputes, 55 percent had engaged in disputes with government law enforcement agencies, 52 percent had engaged in labour disputes, and 33 percent had engaged in commercial disputes with their business partners (see Figure 3.14). The median cumulative economic loss that these companies incurred as a result of such disputes was estimated at around five percent of the total operating costs, which is a significant cost for the companies.

3.9 Private Channels - The Most Effective Way to Resolve Disputes

Based on the companies’ experience in Guangdong, the most effective way to resolve disputes, as indicated by 36 percent of the companies, was through private channels (see Figure 3.15). The second most effective way was through the local government, as indicated by 32 percent of the companies. Twenty-one percent of the companies found no effective way to resolve their disputes.

Figure 3.12: Assessment of Legal Protection Services in Guangdong

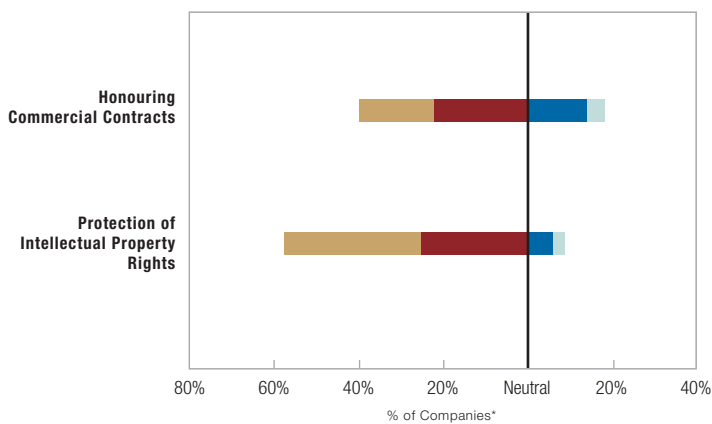
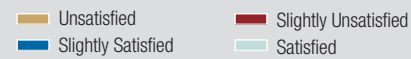


Figure 3.13: Five Most Problematic Issues Faced by Hong Kong Companies in Guangdong

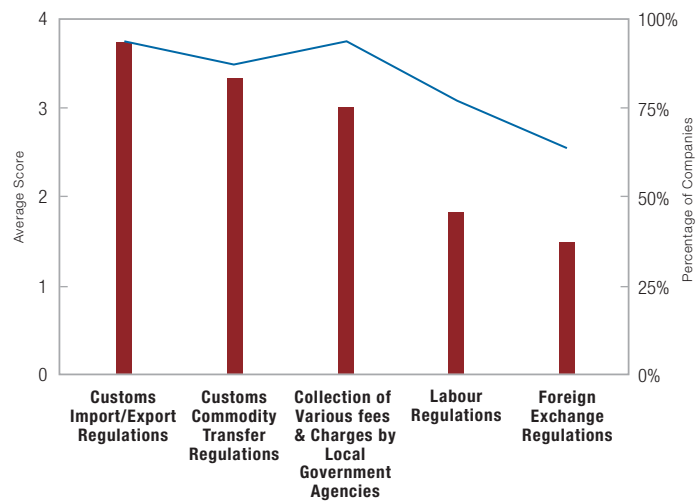


Figure 3.14: Disputes Encountered in the Past Two Years

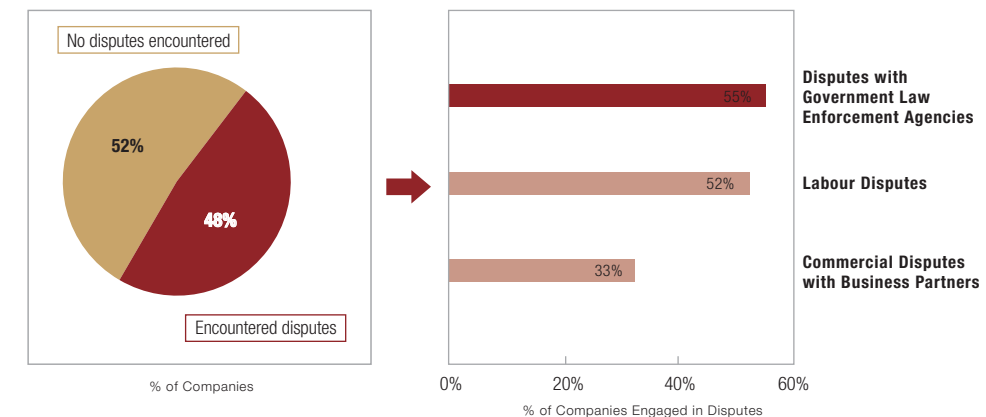
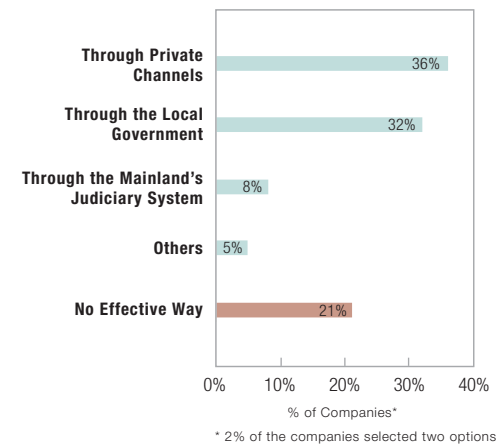


Figure 3.15: Most Effective Way to Resolve Disputes in Guangdong



* The remaining companies were neutral.

* 2% of the companies selected two options

Over the preceding three years, more than 50 percent of the companies rated the handling of disputes by the Guangdong government as either “slightly improved” or “significantly improved” (see Figure 3.16). Only five percent thought that the handling of disputes had either “slightly deteriorated” or “significantly deteriorated”. Thirty-seven percent thought that there had been “no change” in how disputes were handled.



3.10 Main Reasons for Maintaining Operations in Hong Kong

All Five Most Important Reasons Related to Government Policies in Hong Kong

Some companies have chosen to keep their operations in Hong Kong rather than exploit the considerable advantages of shifting them to the Mainland. The companies cited (1) Hong Kong’s simple tax system with its low tax rates, (2) the free port status, (3) the absence of foreign exchange controls, (4) the rule of law and independence of the judiciary, and (5) political stability and good security as the five most important reasons for maintaining operations in Hong Kong (see Figure 3.17). More than 50 percent of the companies chose these five reasons as their major considerations for maintaining operations in Hong Kong. All these factors are related to public policy and the politico-legal institutional framework in Hong Kong.



At the operational level, the companies surveyed made considerable use of the services provided by different government departments and non-governmental public bodies² in Hong Kong. About 53 percent had obtained assistance or support services from these government departments or public bodies at least once in the preceding year, and 49 percent felt the departments or public bodies were helpful to their operations in the Mainland. The four most popular government departments and public bodies were the Trade and Industry Department, the Hong Kong Trade Development Council, the Hong Kong Productivity Council, and various trade associations.

² They include Hong Kong Trade Development Council, Hong Kong Productivity Council, Trade and Industry Department, Innovative and Technology Commission, Intellectual Property Department, Hong Kong Science and Technology Parks Corporation, trade associations, and research institutes at local universities.

3.11 Major Competitors

The companies surveyed perceived that their major competitors were from the Mainland (see Figure 3.18). They were asked to rank the degree of competitive threat to them from companies around the region from one to five, with five as the highest perceived degree of threat. Mainland companies received the highest average score. Moreover, 44 percent of the Hong Kong companies gave Mainland companies a score of five. Only 6-7 percent of the companies indicated that companies in Hong Kong, Taiwan, South Korea and other Asian areas posed the greatest threat.



Supplementary Note

Partners versus Competitors

An electronic appliances company employed 300 workers in Hong Kong. In 1988 it set up a large factory in Dongguan and employed some 9,000 workers. The company was primarily an OEM factory when it was first set up in Hong Kong. In the past few years, it explored ODM products and set up its R&D team. In 2001, the company acquired a brand-named product and then subcontracted the production to other OEM factories in the Mainland.

The company’s managing director indicated that Hong Kong companies had enjoyed good relationships with overseas buyers for some time. He believed that the competitive advantages of Hong Kong companies are their knowledge of overseas markets and their relationships with overseas buyers. He thought that instead of competing with Mainland factories, Hong Kong companies should develop partnership relationships with Mainland factories so as to benefit from (1) the lower cost structure of Mainland factories, and (2) Mainland factories’ knowledge of how to deal with the local government, especially outside Guangdong.

Figure 3.16: Dispute Handling by Guangdong Government over the Past 3 Years

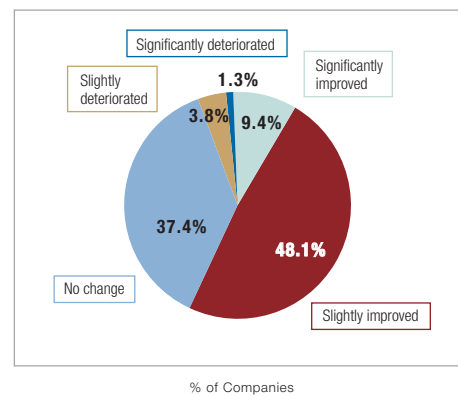


Figure 3.17: Top Five Reasons for Maintaining Operations in Hong Kong

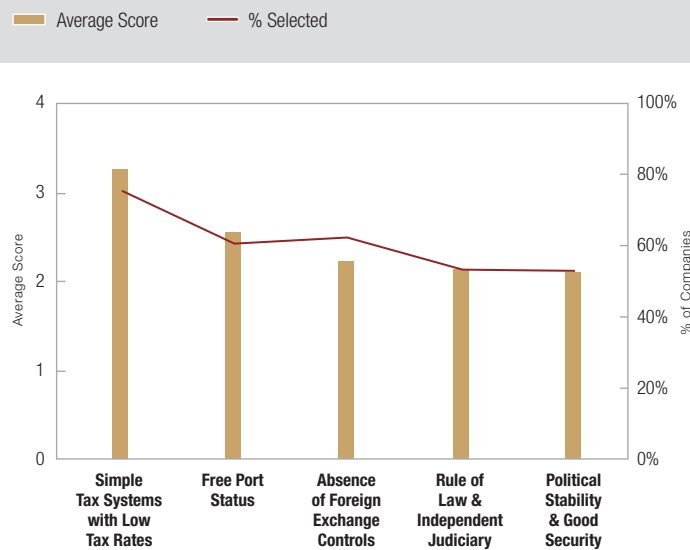
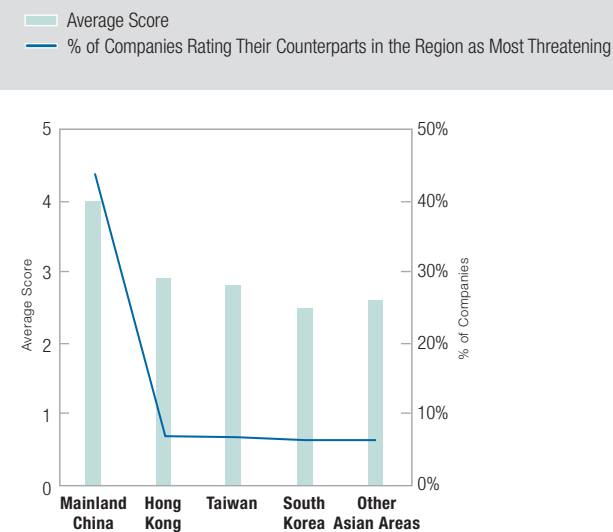


Figure 3.18: Competitors by Region



Chapter 4 Research and Development in Hong Kong and the Mainland

4.1 R&D in Hong Kong Manufacturing Companies

Given the enormous scale of manufacturing operations in Guangdong, the future vitality of that production base is of great concern to Hong Kong based companies and will significantly impact the welfare of all the people in the Greater PRD Economic Region. Our surveys show that although there are still complaints about the business environment in Guangdong, it is clearly improving, especially in the area of hard infrastructure. The fact that most companies intend to further shift their operations into Guangdong is indicative of their confidence, even if it is qualified, in the improving business environment there.

Although Hong Kong continues to perform a vital role as the driver of the Greater PRD Economic Region, its current lead in the area of soft infrastructure in the region will narrow over time as Guangdong continues to reform and liberalize. China's accession to the WTO and the competitive challenge posed by the Greater YRD will

may erode Hong Kong's advantage in this area.

One important aspect critical to the Greater PRD Economic Region's competitive advantage in the area of soft infrastructure is its R&D performance. Whether the manufacturing base in Guangdong can sustain productivity growth and move up the value chain will depend partly on R&D investments. How do Hong Kong and Guangdong measure up against other regions, and how can Guangdong's competitive advantage be enhanced in the area of R&D?

According to the Part II survey, a total of 227 companies, equivalent to 49 percent of the companies surveyed, conducted R&D activities either in-house or by contracting out (see Figure 4.1). Most of the R&D activities conducted by these companies were development-related rather than research intensive. "Design and development of new products or new functions for existing products" was carried out by 78 percent of the R&D active companies,

"development of new production processes" by 39 percent, and "development of new materials" by 32 percent. Around 39 percent of the companies carried out at least two of these three types of R&D activities.

Among companies that were active in R&D, 57 percent engaged in in-house R&D, and 38 percent both engaged in in-house R&D and contracted out R&D activities (see Figure 4.2). Only five percent of the companies contracted out all their R&D activities. These companies contracted out their R&D activities to various organizations in Hong Kong (67 percent), in the Mainland (55 percent) and overseas (25 percent). Such organizations include universities, research institutions, commercial organizations, non-profit organizations and government agencies.

R&D Expenditure

The median ratio of R&D expenditure to total turnover was found to be around 1-2 percent among the respondents (see Figure 4.3). The types of R&D expenditure included payroll for R&D staff (30 percent), procurement of materials (22 percent), expenditure on equipment and instruments (21 percent), testing fees (12 percent), and contracting out R&D projects (9 percent).

R&D Staff

The total number of R&D staff employed by the surveyed companies was 5,308, of which 27 percent were researchers, 38 percent were technicians, and the remaining 35 percent were support staff

(see Figure 4.4). The R&D departments of our surveyed companies were mainly located in Guangdong and Hong Kong, with a few located in the Greater YRD, other provinces in the Mainland, and overseas. The geographic breakdown of the employed R&D staff is as follows: Guangdong: 53 percent, Hong Kong: 17 percent, The Greater YRD: 3 percent, other Mainland provinces and cities: 19 percent, and overseas locations: 8 percent.

The geographic breakdown of the employed R&D staff by educational level appears in Figure 4.5. The proportion of R&D staff who were at least diploma holders is higher when they are employed overseas (81 percent) or in the Greater YRD (78 percent) than when

Figure 4.1: R&D Activities of Hong Kong Companies

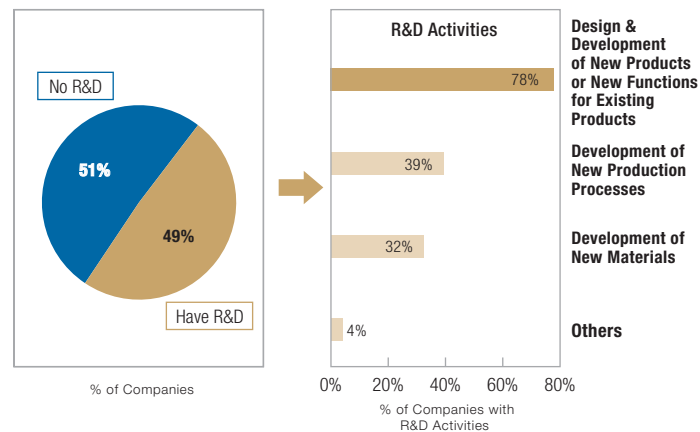


Figure 4.2: Engagement of R&D Activities

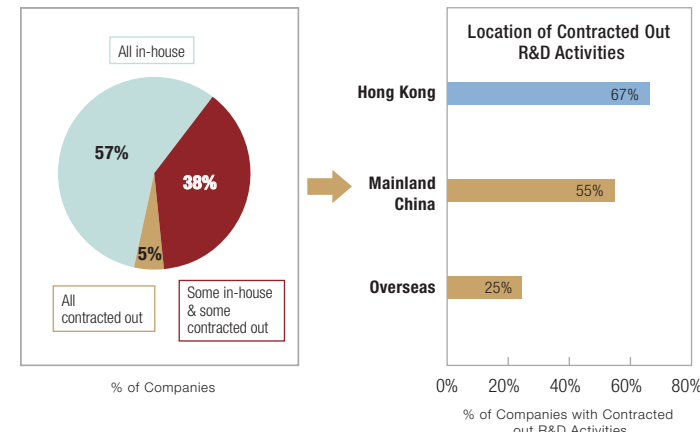


Figure 4.3: R&D Expenditure to Turnover Ratio and Composition of R&D Expenditure

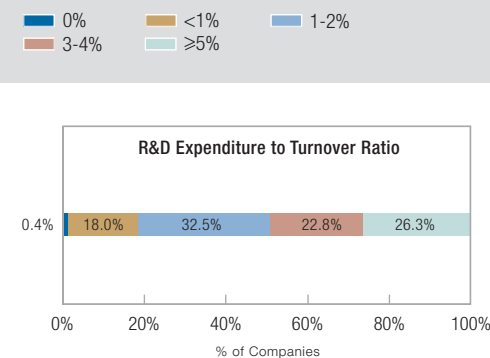
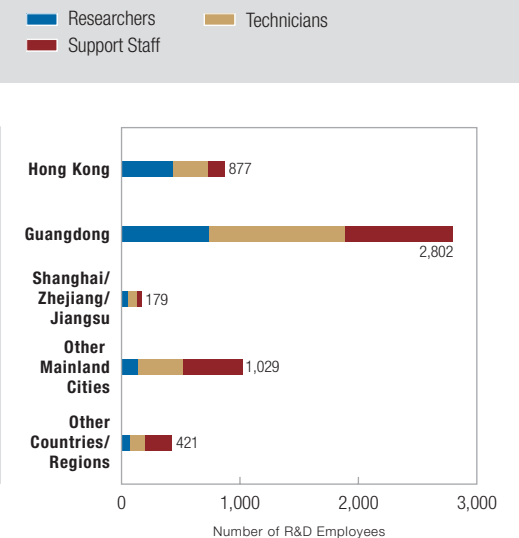


Figure 4.4: R&D Employees by Level



they are employed in Hong Kong (58 percent), Guangdong (39 percent), and other provinces or cities in the Mainland (38 percent).

R&D Location

It is interesting to note that the surveyed companies that were actively engaged in R&D employed only 17 percent of their total R&D staff in Hong Kong. Their R&D departments were mainly located in Guangdong and Hong Kong, with some located elsewhere in the Mainland and overseas. Hong Kong based companies have invested heavily in R&D activities outside the territory in order to gain access to technologies and acquire R&D capabilities. The fact that R&D activities have spread beyond Hong Kong's borders leads us to predict that the measured efficiency of R&D investments made by Hong Kong based companies, say in terms of the number of patents per researcher, could be very high. This is in fact the case.

According to our in-depth interviews, medium-sized to large companies tend to set up their R&D departments in both Hong Kong and Guangdong, with Hong Kong professionals leading the R&D activities. On the other hand, small to medium-sized companies tend to set up their R&D departments only in Guangdong, without engaging Hong Kong professionals to monitor R&D activities. Inexpensive wages and rents in Guangdong have allowed smaller companies to start R&D departments in Guangdong with much lower risk and less capital investments - advantage over setting up R&D operations in Hong Kong.

In our survey, we asked companies to rank four most important when factors which they considered in determining where to locate their R&D facilities. The most important consideration was "the supply of talent"; followed by "research facilities", "research costs", and "the free flow of information" (see Figure 4.6). These factors were selected by over half of the surveyed companies. Most were

more satisfied with the Mainland's supply of talent than with Hong Kong's. It is worth mentioning that many Mainland universities have tailored a wide range of special skill studies for their students to provide the manufacturing industry with a reliable talent pool. There are also quite a few vocational training schools in the Mainland, including the Printing University and the Textile University, that cater to demand for specialized skills. Hong Kong based companies can choose from some of these institutions' best graduates and then train them to become professional technicians or engineers.

Main Difficulties Encountered in R&D

Most of the companies surveyed had encountered difficulties in carrying out R&D activities in Hong Kong and Guangdong. Seventy-one percent indicated that they had encountered

difficulties in Hong Kong. The companies with difficulties ranked "recruitment of high-calibre staff", "financing" and "identification or sourcing R&D partners" as the top three difficulties (see Figure 4.7). These difficulties were chosen by 45 percent to 66 percent of the companies.

Seventy-five percent of the companies indicated that they had encountered difficulties in Guangdong when carrying out R&D activities. The companies with difficulties ranked "recruitment of high-calibre staff", "insufficient intellectual property rights protection" and "financing" as the top three difficulties. These difficulties were chosen by 44 percent to 59 percent of the companies.

Future R&D Plans

The survey found that 78 percent of the 481 companies with operations in Guangdong have plans to undertake

R&D activities in the future (see Figure 4.8). These companies indicated that the R&D activities they planned to engage in were (1) designing and developing new products or new functions for existing products (69 percent), (2) developing new production processes (30 percent), and (3) developing new materials (16 percent). Around 15 percent of the companies planned to carry out more than one kind of such R&D activities.

Among the companies currently engaging in R&D activities, some 56 percent planned to increase R&D expenditure in the next one to two years (see Figure 4.9). Another 29 percent did not plan to change their R&D expenditure. Only three percent planned to reduce their R&D expenditure. Forty-five percent of the companies planned to recruit more R&D staff.

Figure 4.5: R&D Employees by Educational Level

■ Doctoral/Master Degree
■ Bachelor/Associate Degree/Diploma
■ Below Associate Degree/Diploma

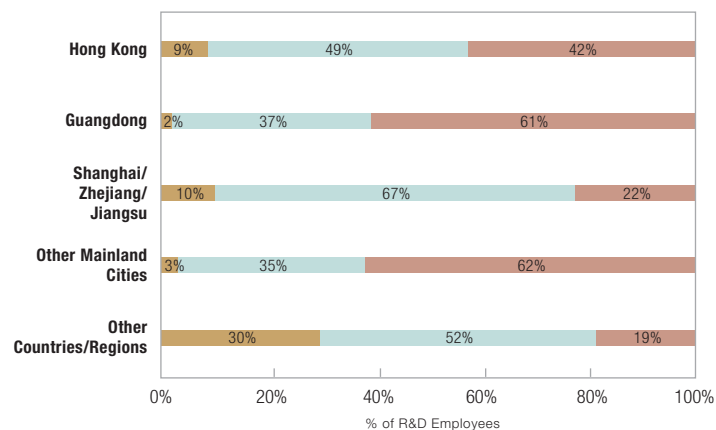


Figure 4.6: Factors Determining R&D Locations

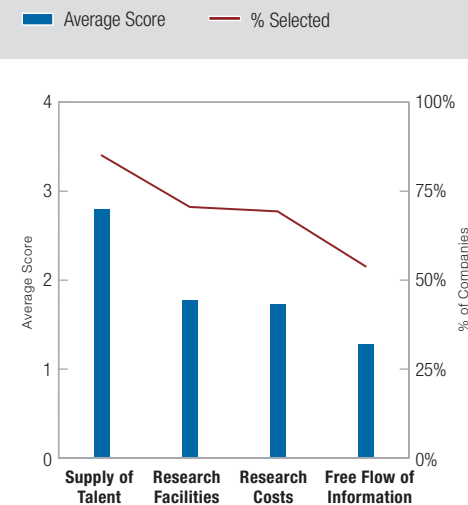


Figure 4.7: Difficulties Encountered in R&D Activities in Hong Kong and Guangdong

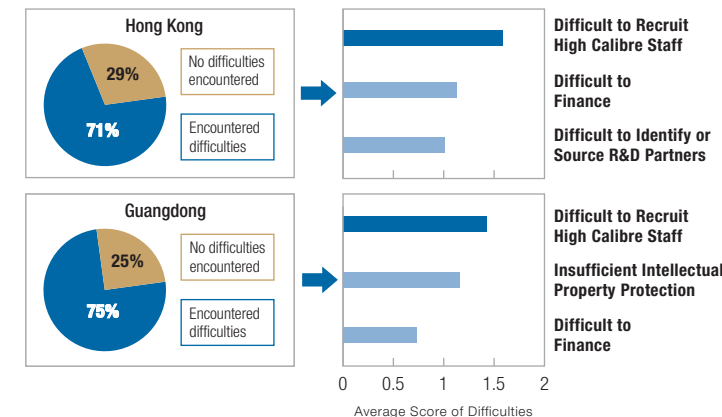
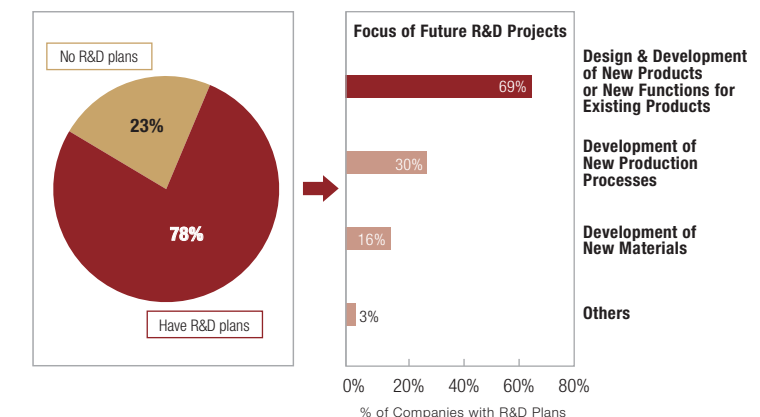


Figure 4.8: Future R&D Plans



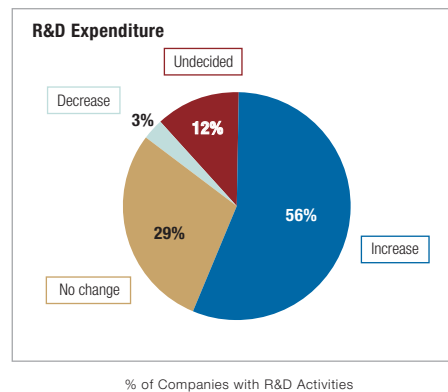
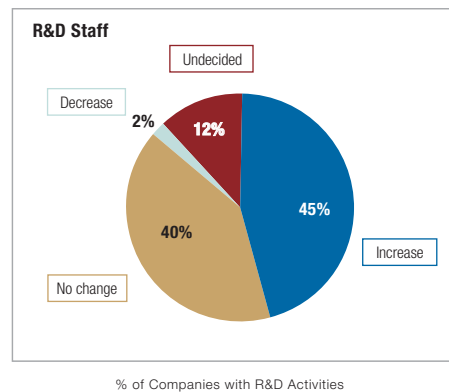
56% and 45% of the surveyed companies will increase their R&D expenditure and R&D staff respectively over the next two years.



Another 40 percent planned to maintain the current level of R&D staff. Only two percent planned to reduce the current level of R&D staff. Twelve percent had not yet determined the level of their R&D activities in the next one to two years.

A large proportion of the companies (46 percent) planned to recruit more R&D staff in Guangdong, followed by other Mainland provinces (30 percent), and the Greater YRD region (24 percent) (see Figure 4.10). Only 13 percent indicated that they would recruit more R&D staff in Hong Kong, and 10 percent indicated that they would recruit more from overseas. Almost two-thirds of the companies indicated that they would not change the scale of their R&D activities in Hong Kong. This finding is consistent with those discussed in chapter 3, in which half of the companies indicated that their Hong Kong staff engaged in R&D activities in Guangdong had either all been replaced or would all be replaced by local staff within 5 years.

Figure 4.9: Change in R&D Staff and Expenditure over the Next 1-2 Years



4.2 R&D Indicators in OECD and Asian Economies

According to standard OECD definitions, the R&D expenditure to GDP ratio in 2000 for China¹ and Hong Kong were 1.00 percent and 0.48 percent, respectively (see Table 4.1). The number of full-time-equivalent (FTE) researchers per 1,000 employed persons for China and Hong Kong were, respectively, 1.0 and 1.3. The funds and staff devoted to R&D activities were substantially lower than those in OECD countries, Singapore, and Taiwan.

¹ The data presented for China are in line with OECD manual recommendations and have been available since 1991. Before 2000, all the staff data and 95 percent of the expenditure data for the business enterprise sector were only available for large and medium-sized companies. Since 2000, the survey has covered almost all industries and all companies with annual sales above Rmb 5 million. Since the reform of the science and technology system, some government institutions have become commercialised, and their R&D data have been added to the business enterprise sector data since 2000.

The business sector is the major source of R&D funds in China, accounting for 55 percent of total funds provided. It is also the major recipient of R&D expenditures, accounting for 60 percent of total R&D funds spent.² This pattern of industry-funded R&D expenditure is similar to that present in other OECD economies and in the more successfully

² The government and higher education sectors cover all fields of natural science engineering, social sciences and humanities, but the business enterprise sector covers only natural science and engineering.

industrialized Asian economies. The exception is Hong Kong, where 82 percent of funding for R&D comes from the government, and 80 percent of R&D expenditure was provided to higher education institutions. The business sector only provided 20 percent of total R&D funding. Since there is extensive economic integration between Hong Kong and Guangdong in the area of manufacturing, information on R&D may

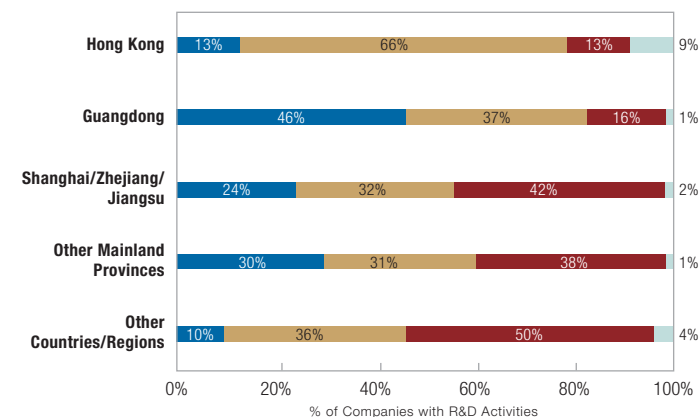
Table 4.1: Main Science and Technology Indicators in OECD and Selected Non-member Asian Economies, 2000

	R&D Expenditure to GDP Ratio (%)	Sectoral R&D Expenditure (%)			Total Researchers		Number of Utility Patents Granted by USPTO	Number of Utility Patents Per 1000 FTE Researchers
		Industry	Higher Education	Government	Full Time Equivalent	Per 1,000 Employees		
OECD Member Economies								
Total OECD	2.23	69.5	17.2	10.4	3,363,301	6.4	150,620	44.8
United States	2.72	74.4	14.2	7.0	1,261,227	8.6	85,070	67.5
Japan	2.93	71.0	14.5	9.9	647,572	9.7	31,296	48.3
South Korea	1.92	74.0	11.3	13.3	108,370	5.2	3,314	30.6
European Union	1.90	64.2	21.4	13.6	969,143	5.8	24,967	25.8
Non-member Economies								
China	1.00	60.0	8.6	31.5	695,062	1.0	119	0.2
Hong Kong	0.48	18.0	80.0	2.0	4,423	1.3	179	40.5
Taiwan	2.05	63.6	12.2	23.5	55,460	5.8	4,667	84.2
Singapore	1.88	63.3	23.6	13.2	16,740	8.2	218	13.0

Source: OECD, Main Science and Technology Indicators, Volume 2002/2, Hong Kong Monthly Digest of Statistics, March 2003

Figure 4.10: R&D Manpower Planning over the Next 1-2 Years

Legend: Increase (Blue), No Change (Orange), Undecided (Red), Decrease (Light Blue)



have underreported the true extent of Hong Kong companies' R&D activities.

In 2000, there were 695,062 R&D researchers in China, the third-largest number in the world, after the United States and the European Union. However, the U.S. Patent and Trademark Office (USPTO) granted only 119 utility patents³ to Chinese companies or inventors, far less than the numbers granted to OECD countries, for example, the United States (85,070), the United Kingdom (3,667), Japan (31,296), France (3,819), Germany (10,234), South Korea (3,314), and some Asian economies (e.g., Taiwan) (4,667).

These figures suggest that the level of innovative and knowledge-driven output in China is low compared with its level of

R&D inputs. Although China's world market share of high technology products has been increasing rapidly, the innovation and knowledge embodied in these goods do not belong to Chinese inventors.

According to Sachs and McArthur (2001), there are only a few highly patented countries.⁴ In 2000, the top 10 patenting countries in the world account for 94 percent of all utility patents taken out in the United States. The top 20 patenting countries account for 99 percent of all utility patents taken out in the United States.

The number of utility patents is usually an indicator of an economy's capacity for technological innovation. However, design innovation was not recorded in the data used by Sachs and McArthur (2001). Design patenting is an important indicator of the amount of R&D activities in Hong Kong and Taiwan.

(1) In 2000, the USPTO granted 179 utility patents⁵ and 368 design patents⁶ to Hong Kong companies and inventors. In the same year, it granted 4,667 utility patents and 1,135 design patents to Taiwanese companies and inventors.

(2) Greater China's share of utility patents granted by the USPTO to all foreign countries increased from one percent in 1985 to seven percent in 2001. Greater China's share of design patents granted by the USPTO to all foreign countries increased from four percent in 1985 to 25 percent in 2001. The number of both types of patents granted has increased dramatically over time, but the level of activities is heavily in favor of design patents. Taiwanese inventors represented 87 percent of total cumulative patents granted in Greater China for the years 1981-2001. Other than Japan and South Korea, Taiwan is one of the few Asian economies notable

³ A utility patent is issued for the invention of a new and useful process, machine, manufacture, or composition of matter, or for a new and useful improvement thereof. Such a patent generally permits its owner to exclude others from making, using, or selling the invention for a period of up to 20 years from the date of patent application filing, subject to the payment of maintenance fees.

⁴ See Jeffrey D. Sachs and John W. McArthur, "Technological Advancement and Economic Growth in Asia," in *Technology and the New Economy*, co-edited by C E Bai and C W Yuen, MIT Press, 2002. Originally presented on May 25, 2001, as part of the Technology and the Economy Lecture Series at the University of Hong Kong.

⁵ Patents protect innovations developed by companies, institutions or individuals. USPTO issues several different types of patents, which include (1) utility patents, (2) design patents, (3) plant patents, (4) reissue patents, (5) defensive publications, and (6) statutory invention registration. Approximately 90 percent of the patent documents issued by USPTO in recent years have been utility patents, also referred to as "patents for invention."

⁶ A design patent is issued for a new, original, and ornamental design for an article of manufacture. It permits its owner to exclude others from making, using, or selling the design for a period of 14 years from the date of patent grant. Design patents are not subject to the payment of maintenance fees.

4.3 R&D in China

R&D Expenditure and Staff in 2001

Beijing is the leading R&D-intensive municipality in the Mainland in terms of R&D expenditure, R&D expenditure to GDP ratio, total number of FTE R&D staff, and total FTE R&D staff per 1,000 total employees (see Table 4.2). Shanghai is ranked fourth on R&D expenditure, third on R&D expenditure to GDP ratio, sixth on total FTE R&D staff, and second on total FTE R&D staff per 1,000 total employees. Jiangsu is ranked third on R&D expenditure, eighth on R&D expenditure to GDP ratio, third on total FTE R&D staff, and sixth on total FTE R&D staff per 1,000 total

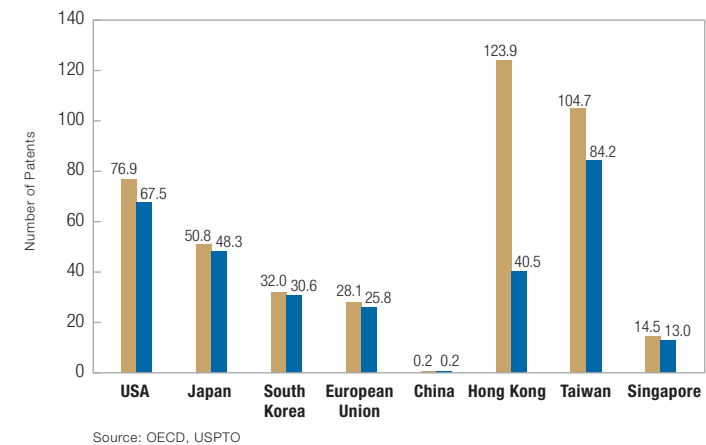
employees. Guangdong is ranked second on R&D expenditure, sixth on R&D expenditure to GDP ratio, second on total FTE R&D staff, and seventh on total FTE R&D staff per 1,000 total employees. Total R&D expenditure in the Greater PRD Economic Region is almost identical to that in the Greater YRD Economic Region at approximately RMB 22 billion. Guangdong's R&D expenditure and staff are highly concentrated in the manufacturing industries, which account for, respectively, 64 percent and 54 percent of the total amount of R&D expenditure of the entire province in 2001.

for having made a quick transition from technology adoption to technology innovation in the past 20 years.

These figures show that Greater China's capacity for design has played an important role in innovation. Figure 4.11 compares the number of all patents and utility patents granted per 1,000 FTE researchers in different economies in 2001. One notices that Hong Kong and Taiwan had a larger number of patents granted, compared with other countries. As we shall later demonstrate, researchers in the Mainland employed by Hong Kong based companies played an important role in enhancing Hong Kong's R&D outputs. Taiwan, like Hong Kong, is a major FDI provider in the Chinese Mainland. We would expect that some of Taiwan's R&D patents, particularly design patents, could be similarly accounted for.

Figure 4.11:
Number of All Patents and Utility Patents Granted per 1,000 Researchers, 2001

■ Number of All Patents per 1,000 FTE Researchers
■ Number of Utility Patents per 1,000 FTE Researchers



Domestic patents⁷ granted by China's Patent Office are divided into the following categories: invention patents, utility models patents, and design patents. Utility model patents have a lower degree of invention than do invention patents.

⁷ China established a patent office in 1980. The administrative authorities for patent affairs include the Patent Office and the Patent Reexamination Board within the Patent Office.

In 2001, the number of domestic patents granted by the China Patent Office to Guangdong inventors was 18,259, the number granted to Shanghai inventors was 5,371, the number granted to Jiangsu inventors was 6,158, and the number granted to Zhejiang inventors was 8,312. The number of utility models and design

patents granted by the Patent Office to Guangdong inventors was the highest in China. The number of invention patents granted by the Patent Office to Guangdong inventors was 301 and was ranked fourth in China, behind Beijing's 946, Liaoning's 346, and Shandong's 333.

Table 4.2: R&D Expenditure and Personnel in China and Selected Cities and Provinces, 2001

	China	Beijing		Shanghai		Jiangsu		Zhejiang		Guangdong		Hong Kong# (HK\$100 Million)
Total R&D (RMB 100 Million)	1042.49	171.17	(1)	88.08	(4)	92.27	(3)	41.41	(9)	137.43	(2)	70.76
As % of GDP	1.09%	6.02%	(1)	1.78%	(3)	0.97%	(8)	0.61%	(14)	1.29%	(6)	0.55%
Scientific Research Institutions	288.47	91.04	(1)	23.32	(5)	24.43	(4)	3.31	(15)	5.18	(9)	1.47#
Higher Education	102.38	20.86	(1)	10.44	(2)	9.91	(3)	5.09	(7)	4.65	(10)	48.47
Large & Medium Enterprises	442.35	21.10	(6)	39.00	(4)	40.86	(3)	15.18	(7)	89.60	(1)	20.83*
Other Units	209.29	38.17		15.32		17.07		17.38		38.00		—
Manufacturing (L&M Enterprises)	412.43	21.04	(6)	37.12	(4)	39.66	(3)	14.86	(8)	88.54	(1)	4.4^
Total FTE of R&D Personnel	956,482	95,255	(1)	51,965	(6)	78,839	(3)	35,919	(10)	79,052	(2)	7,365
Per 1,000 Total Employment	1.31	15.13	(1)	7.51	(2)	2.21	(6)	1.30	(13)	1.99	(7)	1.9
of which: Scientists & Engineers	742,726	82,207	(1)	42,450	(5)	58,689	(3)	26,171	(12)	65,159	(2)	4,442
Per 1,000 Total Employment	1.02	13.06	(1)	6.13	(2)	1.65	(7)	0.94	(13)	1.64	(8)	1.3
Scientific Research Institutions	204,806	43,982	(1)	14,297	(4)	10,679	(6)	2,739	(20)	4,209	(12)	280#
Higher Education	171,126	18,171	(1)	11,125	(4)	13,882	(2)	5,679	(14)	9,949	(5)	3,791
Large & Medium Enterprises	379,336	12,277	(12)	12,999	(11)	39,182	(2)	1,922	(13)	43,279	(1)	3,294*
Others	201,214	20,825		13,544		15,078		25,579		21,615		—
Manufacturing (L&M Enterprises)	339,374	12,189	(10)	12,653	(9)	37,860	(2)	11,568	(12)	42,804	(1)	1,153^

() Rank * Business # Government ^ Manufacturing
Source: China Statistical Yearbook 2002, China Statistical Yearbook on Science and Technology 2002, Hong Kong Monthly Digest of Statistics, March 2003

Supplementary Note

Major Developments in Science and Technology Policy in China

Transferring Management of Scientific R&D from State to Companies

Before the 1990s, China's science and technology policy mainly focused on supporting the country's national development goals. Most of the researchers worked in state institutes. Since the 1990s, the Chinese reform process has been directed toward restoring the role of science-based technologies as drivers of the civilian economy. In the late 1990s, the central government transferred the management of scientific R&D institutions from the state to companies.

Guangdong—A Pioneer in Combining Science and Technology in the Economy

Shenzhen is a pioneer in terms of orientating science and technology

activities towards the economy. Before 1998, the government in Shenzhen encouraged companies to set up R&D centres and cultivated their own R&D talent. In 1998, government in Guangdong urged the invigoration of the economy through science and education, and this was followed by the transformation of the institutional framework governing scientific research institutions. In 1999, Guangdong stipulated a goal to build a new institutional mechanism for science and technology within three to five years. Under the new institutional mechanism, large companies would play a leading role in R&D activities according to market demand, with state research institutes and universities acting as the supporting team.

Preferential Science and Technology Policies

Preferential science and technology policies (including, preferential tax

policies granted to companies engaged in technology trade, reduced customs duties on equipment, and greatly reduced tariffs if there is high technology content) were put in place to facilitate the development of high-technology industries.⁸

R&D with Foreign Investment

To enhance basic research, applied research, and experimental developments and to foster international scientific and technological cooperation and exchange, the State Science and Technology Commission in 1997 promulgated interim measures on the establishment of foreign-funded research institutions. This was a milestone in China's cooperation with foreign investments in R&D. In 2000, the Chinese government adopted a policy of encouraging the establishment of R&D centres with foreign investment in China.⁹

⁸ Other specific policies concerning technology trade include (1) encouraging exploration of the technology export market, (2) encouraging foreign technology imports, with a focus on renovating existing companies, (3) allowing technology trade to be undertaken through licensing, cooperative production and/or design, technological service, consulting, import of equipment or plants, (4) accelerating integration of trade with scientific research and industrial production, (5) increasing capital input in scientific R&D, (6) offering preferential interest rates for projects critical to the nation's economic development and (7) protecting intellectual property rights.

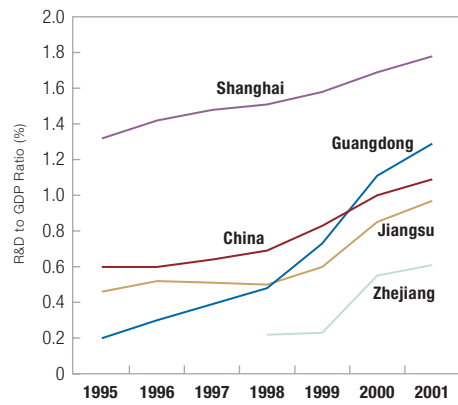
⁹ The Ministry of Foreign Trade and Economic Cooperation issued the Circular Concerning the Approval of Contracts and Articles of Association for the Establishment of Research and Development Centers with Foreign Investments (April 18, 2000).

Guangdong's Growing R&D Capability

In 1998, Guangdong started its reform of the science and technology system. Guangdong's R&D expenditure to GDP ratio began to grow rapidly, rising from 0.48 percent in 1998 to 1.29 percent in 2001 (see Figure 4.12). Prior to 2000, Guangdong's R&D expenditure to GDP ratio was lower than the corresponding ratios in China, Shanghai, and Jiangsu, although it was still higher than the ratio in Zhejiang. The rapid reform of the science and technology system that transferred R&D activities from the state to companies is one of the key factors that contributed to the faster growth rate of R&D expenditure in Guangdong. This reform has also made R&D expenditure more market driven and company based. Since 2000, Guangdong's R&D expenditure to GDP ratio has surpassed that of both China and Jiangsu and lags behind only that of Shanghai.



Figure 4.12: R&D Expenditure to GDP Ratio in China, Guangdong, Shanghai, Jiangsu and Zhejiang, 1995-2001



Source: Guangdong Statistical Yearbook, Shanghai Statistical Yearbook, Jiangsu Statistical Yearbook, China Statistical Yearbook on Science and Technology, various issues

Shanghai is one of China's major education and research centres. Its R&D expenditure to GDP ratio is usually higher than the corresponding ratios in China and other provinces. According to the World Investment Report 2002, various high-technology trans-national corporations have set up over 100 R&D centres in China, mostly in Shanghai and Beijing. For example, Motorola has established 18 R&D centres in the area of electronics, and Microsoft has

established three R&D centres. The availability of a large pool of hard and soft R&D infrastructure support staff, particularly well-qualified researchers, in Shanghai and Beijing has made them attractive locations for R&D centres. Table 4.3 shows that the number of FTE R&D staff in China, Shanghai, Guangdong, Jiangsu, and Zhejiang followed a trend similar to the one characterizing R&D to GDP ratios during 1995-2001.



Table 4.3: R&D to GDP Ratio and Number of R&D Personnel, 1995-2001

	China	Greater PRD Economic Region		Greater YRD Economic Region		
		Hong Kong	Guangdong	Shanghai	Jiangsu	Zhejiang
R&D to GDP ratio (%)						
1995	0.60		0.20	1.32	0.46	
1996	0.60		0.30	1.42	0.52	
1997	0.64		0.39	1.48	0.51	
1998	0.69	0.44	0.48	1.51	0.50	0.22
1999	0.83	0.47	0.73	1.58	0.60	0.23
2000	1.00	0.48	1.11	1.69	0.85	0.55
2001	1.09	0.55	1.29	1.78	0.97	0.61
Number of R&D FTE Personnel						
1995	751,700					
1996	804,000					
1997	831,200					
1998	755,200	5,809	37,856	40,606	49,218	16,119
1999	821,700	6,741	44,125	39,469	55,465	14,898
2000	922,131	6,497	71,107	59,501	71,057	24,991
2001	956,000	7,365	79,052	51,965	78,839	35,919

Sources: China Statistical Yearbook 2002, China Statistical Yearbook on Science and Technology, Hong Kong Monthly Digest of Statistics, May 2001, July 2001, March 2003

4.4 R&D in Mainland Manufacturing Companies

Chinese official statistics provide a good array of indicators related to R&D activities like R&D expenditure, FTE R&D staff, number of (invention) patent applications and number of (invention) patents owned at the company level. These figures are available primarily for large and medium-sized companies. Companies with annual sales above RMB 5 million are further subdivided into large, medium and small companies according to the classification of industrial companies.¹⁰ To compare R&D activities among manufacturing companies between Guangdong, Shanghai, Jiangsu and Zhejiang, we only used information on large and medium-sized companies. This may distort to some extent the true picture due to the omission of small companies, as well as companies with annual sales below RMB 5 million. It is likely that smaller companies are likely to be more prevalent in Guangdong than in Shanghai.

¹⁰ The standard classification of large, medium-sized and small industrial companies was first announced in 1978 and was amended in 1992. This standard classification of companies is mainly based on two major criteria: (1) production capacity and (2) fixed capital investment of production. The precise criteria vary from industry to industry.

R&D in Large and Medium-sized Guangdong Companies

The total gross output value of large and medium-sized manufacturing companies in Guangdong was RMB 652.9 billion in 2001, representing 50 percent of the gross output value of all manufacturing companies there with annual sales above RMB 5 million. Total R&D expenditure in these companies was RMB 8.82 billion, representing 1.36 percent of gross output value. There were 45,229 FTE R&D staff engaged. There were 1,044 invention patent applications and 1,382 invention patents owned. In 2001, Guangdong ranked first in all these input and output indicators of R&D activities among large and medium-sized manufacturing companies in the Mainland.

In 2001, the two major manufacturing industries in Guangdong - electronics and telecommunications, and electrical equipment and machinery - accounted for 76 percent of total R&D expenditure

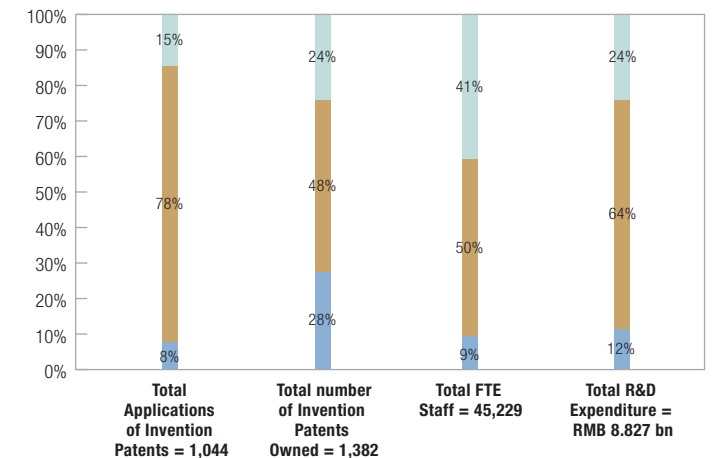
and 59 percent of total R&D staff engaged in Guangdong. These two industries also accounted for 86 percent of the total number of invention patent applications and 76 percent of the total number of invention patents owned by manufacturing industries in Guangdong. The key input and output indicators of R&D are highly concentrated in Guangdong's manufacturing industries (see Figure 4.13).



According to the World Investment Report 2002, China's export performance for the period 1985-2000 has been top ranked in the world for the rapid rise in its market shares in all technology categories, including non-resource-based manufactures, high-technology manufactures, medium-technology manufactures, and low-technology manufactures. China was ranked third in the category of resource-based manufactures. FFEs have played an important role in driving China's

Figure 4.13: Indicators of R&D among Large and Medium-sized Manufacturing Enterprises in Guangdong, 2001

Electric Equipment and Machinery
Electronic and Telecommunications
Other Manufacturing Industries



Source: China Statistical Yearbook on Science and Technology

R&D activities of HK companies are mainly in design and development of new products or new functions for existing products, the development of new production processes, and the development of new materials.

export performance, especially in Guangdong. China's world market share in semiconductor exports increased from 0.14 percent in 1985 to 8.82 percent in 2000. In the same period, its world market share in telecommunications equipment exports increased from 0.04 percent to 5.70 percent.

In 2001, exports of high-technology products accounted for 48 percent of total exports in China as a whole. Of these, computers and telecommunications products were the major export components, representing 78 percent of total high-technology product exports in China, and 86 percent of total high-technology product exports in Guangdong (see Figure 4.14).

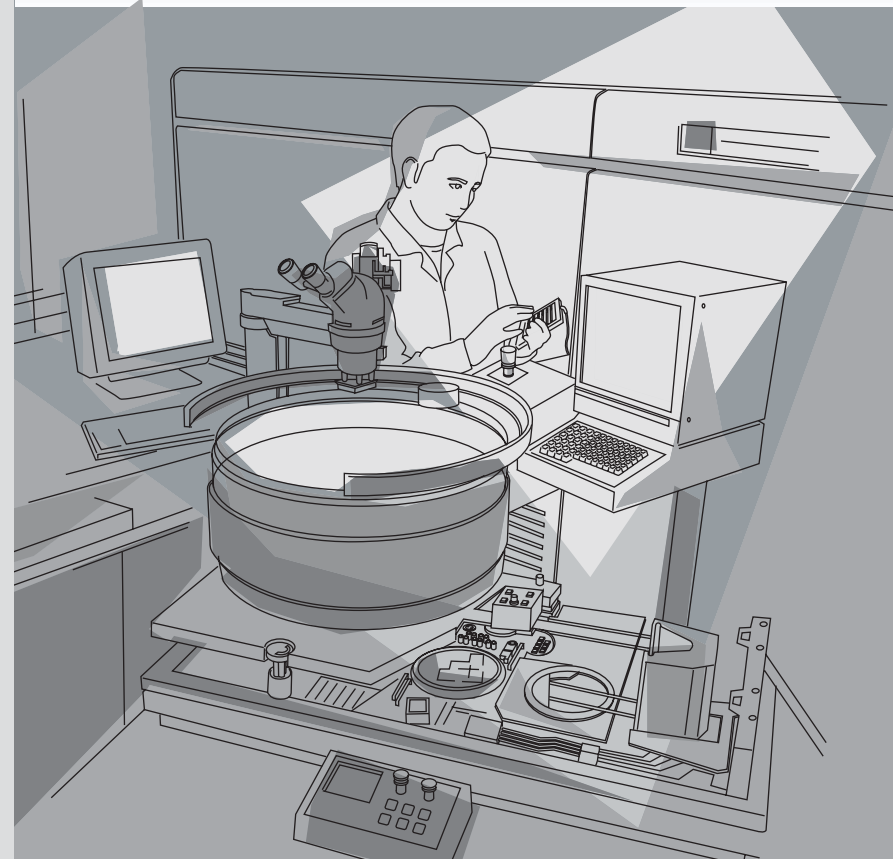
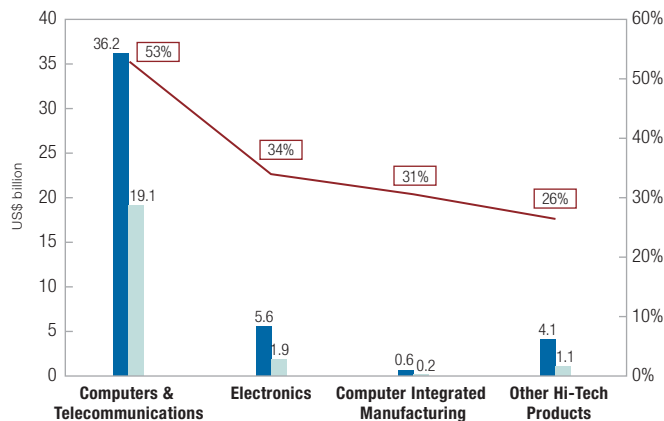


Figure 4.14: High Technology Exports in China and Guangdong, 2001

■ China
■ Guangdong
— Exports of High Technology Products in Guangdong as % of Those in China



Source: China Statistical Yearbook on Science and Technology 2002

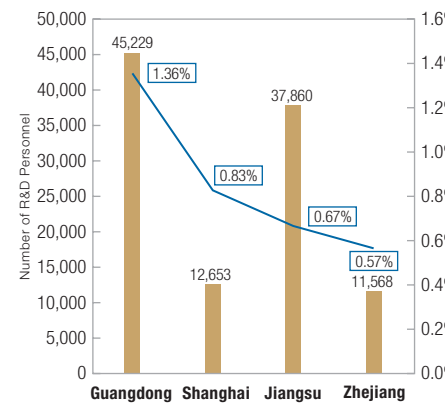
R&D in Large and Medium-sized Shanghai Companies

The total gross output value of large and medium-sized manufacturing companies in Shanghai was RMB 448.4 billion in 2001, representing 64 percent of the gross output value of all manufacturing companies there with sales above RMB 5 million. Total R&D expenditure in these companies was RMB 3.71 billion, representing 0.83 percent of gross output value (see Figure 4.15). There were 12,653 FTE R&D staff engaged. The number of invention patent applications was 224, and the number of invention patents owned was 840 (see Figure 4.16).

An estimated 87 percent of R&D expenditure and 70 percent of R&D staff in Shanghai's manufacturing industries were concentrated in seven

Figure 4.15: R&D Expenditure and Personnel in Large and Medium-sized Manufacturing Enterprises in Guangdong, Shanghai, Jiangsu and Zhejiang, 2001

■ Number of FTE R&D Personnel
— R&D Expenditure as % of Gross Industrial Output Value of L&M Enterprises



Source: China Statistical Yearbook on Science and Technology 2002

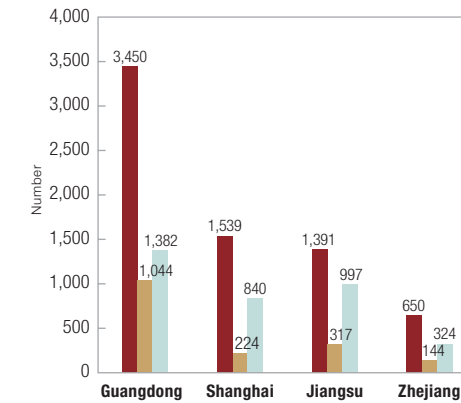
manufacturing industries. These included (1) transport equipment manufacturing, (2) electronic and telecommunications equipment, (3) ordinary machinery, (4) electrical equipment and machinery, (5) medical and pharmaceutical products, (6) raw chemical materials and chemical products, and (7) smelting and pressing of ferrous metals. The number of invention patent applications accounted for 66 percent of the total number of patents in all manufacturing industries, and the number of invention patents owned accounted for 89 percent of the same.

R&D in Large and Medium-sized Jiangsu Companies

The total gross output value of large and medium-sized manufacturing companies in Jiangsu was RMB 59.2 billion in 2001, representing 53 percent of the gross output value of all manufacturing companies there, with sales above RMB

Figure 4.16: R&D Patent Applications and Patents Owned in Large and Medium-sized Manufacturing Enterprises in Guangdong, Shanghai, Jiangsu and Zhejiang, 2001

■ Number of Patent Applications
■ Number of Invention Patents Applications
■ Number of Invention Patents Owned



Source: China Statistical Yearbook on Science and Technology 2002

5 million. Total R&D expenditure in these companies was RMB 3.94 billion, representing 0.67 percent of gross output value. There were 37,860 FTE R&D staff engaged. The number of invention patent applications was 317, and the number of invention patents owned was 997.

An estimated 61 percent of R&D expenditure and 66 percent of R&D staff in Jiangsu's manufacturing industries were concentrated in five manufacturing industries. These included (1) electronic and telecommunications equipment, (2) electric equipment and machinery, (3) transport equipment manufacturing, (4) raw chemical materials and chemical products, and (5) ordinary machinery. The number of invention patent applications accounted for 48 percent of the total in all manufacturing industries, and the number of invention patents owned accounted for 39 percent of the same.

R&D in Large and Medium-sized Zhejiang Companies

The total gross output value of large and medium-sized manufacturing companies in Zhejiang was RMB 26.2 billion in 2001, representing only 36 percent of the gross output value of all manufacturing companies there with sales above RMB 5 million. Total R&D expenditure in these companies was RMB 1.47 billion, representing 0.57 percent of gross output value. There were 11,568 FTE R&D staff. The number of invention patent applications was 144, and the number of invention patents owned was 324.

An estimated 70 percent of R&D expenditure and R&D staff in Zhejiang's manufacturing industries were concentrated in eight manufacturing industries. The number of invention patent applications accounted for 53 percent of the total in all manufacturing industries, and the number of invention patents owned accounted for 45 percent of the same.

4.5 Human Resources

Although the proportion of FTE R&D staff in Hong Kong is low, the overall educational level of the population in Hong Kong is not lower than that in Shanghai, Guangdong, and other provinces and municipalities in the Mainland. In Hong Kong, most highly qualified individuals work in the service sector, which is almost always excluded from R&D data because of difficulties in defining R&D activities in the service sector, even though they do take place. For this reason the overall education of the population is a better measure (compared with the proportion of R&D staff) of the human resource base that serves as the talent pool upon which R&D relies.

Hong Kong and Shanghai

Hong Kong's total population in 2001 was 6.67 million, which is equivalent to only 40 percent of Shanghai's total population of 16.71 million in 2000 (see Figure 4.17). The average educational attainment of Hong Kong residents is higher than that of Shanghai residents.

An estimated 16 percent of Hong Kong residents and 11 percent of Shanghai residents had completed junior college or above. However, the actual number of those who had completed junior college or above was 919,000 in Hong Kong and 1,795,000 in Shanghai. This means that investors in Shanghai have a larger talent pool to draw upon for their human resource requirements than do investors in Hong Kong. At the very high end, Hong Kong has 123,000 postgraduate students (2.2 percent of residents aged six or above), whereas Shanghai has only 76,188 (0.5 percent of residents aged six or above). In this area, Hong Kong still has an advantage.

In the period 1990-2000, the annual growth rate in the number of residents who had completed junior college or above was 6.5 percent in Hong Kong, which was lower than the 7.5 percent in Shanghai. In the same decade, the net increase in the number of residents who had completed junior college or above was 428,000 in Hong Kong and

959,000 in Shanghai. This suggests that relying on Hong Kong's education and continuing education system alone is not sufficient to meet the demand for high quality manpower. An immigration policy to encourage inflow of talent into Hong Kong is thus needed urgently. Shanghai's population had over the decade been growing at an annual rate of 2.3 percent, whereas the corresponding growth rate in Hong Kong was only 1.7 percent.

Guangdong, Jiangsu, and Zhejiang

In 2000, the total population in Guangdong was 86.42 million, which is around 71 percent of the combined population in Jiangsu (74.38 million) and Zhejiang (46.77 million). The average educational attainment of Guangdong residents is comparable to that of Jiangsu and Zhejiang residents (see Table 4.4). An estimated 3.9 percent of Guangdong's residents, 4.2 percent of Jiangsu's residents, and 3.4 percent of Zhejiang's residents had completed junior college or above in 2000.

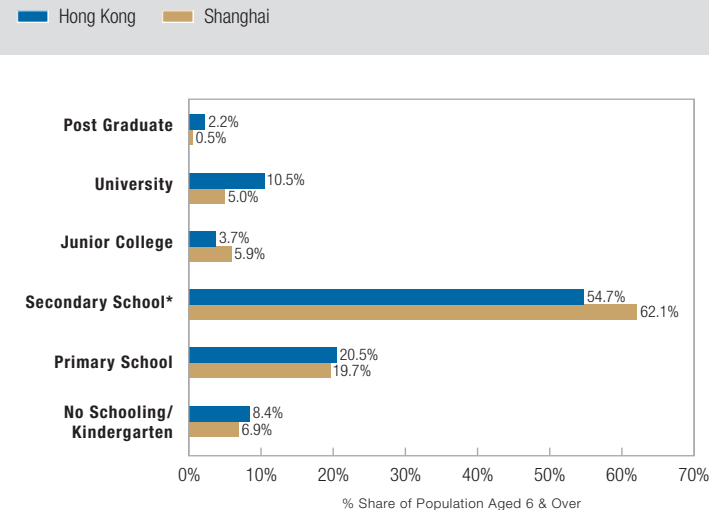
Although Guangdong is not a higher education centre in China, the annual growth rate in the number of residents who had completed junior college or above was 13.8 percent in the decade 1990-2000, compared with Jiangsu's 11.4 percent and Zhejiang's 11.9 percent (see Table 4.5). The net increase during this period in the number of residents who had completed junior college or above was around 2.24 million in Guangdong, 1.93 million in Jiangsu, and 1.01 million in Zhejiang.

Table 4.4: Population by Educational Attainment in Greater PRD and Greater YRD Economic Regions, 2000

	Greater PRD Economic Region		Greater YRD Economic Region		
	Hong Kong	Guangdong	Shanghai	Jiangsu	Zhejiang
Total Population (in million)	6.67	86.42	16.74	74.38	46.77
Population Aged 6 & Over (in million)	5.60	78.20	15.81	69.22	43.12
No schooling	8.0%	5.0%	5.5%	6.6%	7.5%
Eliminate illiteracy		1.0%	1.4%	2.4%	3.1%
Primary school	21.0%	36.1%	19.7%	34.7%	39.0%
Junior middle school	19.0%	40.0%	38.2%	38.4%	35.5%
Senior middle school	26.0%	10.5%	16.9%	10.7%	8.9%
Specialized secondary school/ Matriculation*	9.0%	3.6%	7.0%	3.1%	2.6%
Junior college	4.0%	2.6%	5.9%	2.7%	2.2%
University	10.5%	1.2%	5.0%	1.4%	1.1%
Post Graduate	2.2%	0.1%	0.5%	0.1%	0.1%

* Specialized secondary school in the Mainland China is not comparable to Matriculation level in HK.
Source: China Statistical Yearbook 2002. Data in the table are the tabulation data of the 5th national population census in 2000, HK Census and Statistics Department, 2001 Population Census-Main Tables

Figure 4.17: Population by Educational Attainment in Hong Kong and Shanghai



4.6 Implications for Hong Kong

The rapid economic development in Guangdong has attracted highly qualified residents from other provinces, and this inflow offset the relative shortage of university and college places. Indeed, over the past decade, Guangdong's population grew at an annual rate of 3.2 percent.

Guangdong has been investing heavily in R&D and is catching up with some of the leading R&D centres in the Mainland, including Shanghai and Beijing. In Guangdong, industry - and not research institutions belonging to universities or the government - primarily make R&D investments. One would therefore expect Guangdong's R&D investments to be heavily industry oriented. Although

Guangdong does not have a heavy concentration of research institutions and universities, it has been able to make R&D investments by relying on human talent inflows from other provinces. Indeed, Guangdong has been far more successful in attracting educated manpower inflows than all other provinces have.

According to official figures, the level of R&D expenditure in the Greater YRD Economic Region is about the same as that in the Greater PRD at present. However, given the relatively higher cost of hiring R&D personnel in Hong Kong, the real amount of R&D activities may be higher in the Greater YRD than in the Greater PRD Economic Region. This is borne out by the fact that the number of R&D staff in the Greater YRD is nearly twice that in the Greater PRD Economic Region. It is not surprising that foreign investors often choose Shanghai as a place to locate their R&D centres, given the larger population and, therefore, the bigger stock of better-educated people in the Greater YRD, and also given the higher concentration of research institutions and universities there.

Hong Kong's reported investments in R&D are extremely modest according to official figures. However, these figures may understate the actual amount of R&D investments made by Hong Kong companies because some R&D takes place overseas and may not be reported. The number of design patents registered by Hong Kong inventors with the USPTO is impressive, but the number of utility patents is not. Hong Kong companies are obviously quite innovative when it comes to designing products. This suggests that the strength of Hong Kong companies is not really in manufacturing products at the cutting edge of technology, but rather to be the best in the world in their chosen class of products.

The number of patents granted to Guangdong inventors by the China Patent Office is about the same as the total number granted to Shanghai, Jiangsu and Zhejiang altogether. One therefore has reason to conjecture that at the present time companies in the Greater PRD are as innovative as those in Greater YRD in their chosen class of products, if not more so.

The Greater YRD has two advantages over Guangdong in providing for R&D investments. One is its larger human capital talent pool and the other is its concentration of research institutions and universities. If cooperation between Hong Kong and Guangdong can be further improved, then it would be feasible for Hong Kong to tap into Guangdong's growing human capital talent pool and for Guangdong to gain access to Hong Kong's excellent research institutions and universities. Unlocking this opportunity for synergistic cooperation between Hong Kong and Guangdong would enhance the competitive advantage of the Greater PRD Economic Region in the area of R&D.

An important requirement for realizing this potential will be the further relaxation of travel restrictions between Guangdong and Hong Kong so that R&D staff can commute freely between the two places. Unrestricted travel for R&D personnel creates a more stable environment in which companies can invest in recruiting R&D personnel and identifying R&D partners. Present arrangements for bringing R&D

personnel into Hong Kong entail applying for immigration, which is costly for companies trying to amass a fledgling R&D staff. Supporting a team of full-time R&D staff in Hong Kong is not viable for smaller companies.

A policy to facilitate unfettered travel for R&D staff between Guangdong and Hong Kong could provide a powerful incentive for attracting R&D investments from local and overseas companies to locate R&D centres in Hong Kong, where there is better protection of intellectual property rights than in Guangdong. It is also worth noting that manufacturing activities in Guangdong are heavily concentrated in electronics and electrical products - an area in which Hong Kong has considerable research and technical capability that could be applied to create higher value-added for industries in Guangdong.

If it were possible to combine the respective competitive advantages of Guangdong and Hong Kong, then the Greater PRD Economic Region could compensate for some of the apparent disadvantages it has currently, when compared with the Greater YRD.

Table 4.5: Net Increase of Residents with Education at Junior College or Above Levels

	(1)	(2)	(3) = (2) - (1)	Average Annual Growth Rate
	(10,000)	(10,000)	Net Increase (10,000)	
Greater PRD Economic Region				
Hong Kong	1991	2001		
Total population	567.4	670.8		
of which: Non-degree course & Degree course	49.1	91.9	42.8	6.5%
Guangdong	1990	2000		
Total population	6,283.0	8,642.2		
of which: Junior college or above	84.1	307.7	223.6	13.8%
Greater YRD Economic Region				
Shanghai	1990	2000		
Total population	1,334.2	1,674.0		
of which: Junior college or above	87.2	183.1	95.9	7.7%
Jiangsu				
Total population	6,705	7,438.1		
of which: Junior college or above	98.8	291.4	192.5	11.4%
Zhejiang				
Total population	4,144.6	4,677.0		
of which: Junior college or above	48.5	149.1	100.6	11.9%

Sources: Shanghai Statistical Yearbook, Zhejiang Statistical Yearbook, Jiangsu Statistical Yearbook, Guangdong Statistical Yearbook, China Statistical Yearbook

Chapter 5

The Greater PRD and the Greater YRD Economic Regions

5.1 Overview

The future vitality of the manufacturing operations in Guangdong and the rest of the Mainland have important implications for the economic well being of the population and of the companies based in the region, including the Hong Kong based companies. In the previous chapters we have demonstrated that the business environment in Guangdong is improving, especially in the area of infrastructure and production operations. The finding that most Hong Kong based companies intend to continue to shift their operations into Guangdong is indicative of their confidence in the improving business environment there.

Hong Kong based companies continue to retain operations in Hong Kong because of its favourable legal framework and economic infrastructure. For them the business environment remains highly friendly. These companies play a vital role in driving the export-oriented PRD manufacturing base out of Hong Kong. But with the Mainland's accession to the WTO, Hong Kong's current lead in terms of its business environment may gradually narrow. One important area in which

Hong Kong is losing its advantage is R&D investments – an area in which Hong Kong could arguably remain at the forefront by virtue of its ability to protect intellectual property rights and of the capabilities of its research institutions and universities.

The rise of the YRD in the past decade has established the region as a competitor of Guangdong. The scale of economic activities is growing rapidly in the YRD. Both places are highly market oriented, at least by the Mainland's standards. FDI flows into the YRD have been rising at a faster rate than have those into Guangdong. The amount of goods exported from the YRD is also increasing more rapidly than is the amount exported from Guangdong. Hong Kong based companies are heavily invested in the development of both places. Relocating from Guangdong to the YRD may entail a somewhat different mode of management control because the YRD is farther away from Hong Kong, which might necessitate establishing a separate office, probably in Shanghai, much as investors from Taiwan do.

In this chapter, we consider the salient features of the economies in these two regions. Since we have not conducted a survey of manufacturing companies in the YRD, as we have done for Guangdong, our focus is primarily on aggregate characteristics.

Like the PRD, the YRD is not a well-defined concept but rather an evolving one. The YRD as a designated economic region first emerged in the 1980s. In 1992, the YRD Economic Zone was defined by the State Council as covering the areas of 14 cities and municipalities, including Shanghai municipality; the cities of Nanjing, Zhenjiang, Yangzhou, Suzhou, Wuxi, Changzhou, and Nantong in Jiangsu Province; and the cities of Hangzhou, Jiaxing, Huzhou, Ningbo, Shaoxing, and Zhoushan in Zhejiang Province (see Map 5.1). Taizhou in Jiangsu was subsequently added to the list.

Map 5.1:
Greater YRD Economic Region
and YRD Economic Zone

Greater Yangtze River Delta Economic Region
Yangtze River Delta Economic Zone



The PRD is sometimes considered as embracing the entire province of Guangdong and the YRD as embracing Shanghai, Jiangsu, and Zhejiang. Hong Kong, a critical driver of the PRD economy, is often left out of most references to the PRD, perhaps owing to the special status of Hong Kong as a special administrative region of the Mainland since 1997. Shanghai by contrast is always included as part of the YRD and is often considered the driver of the YRD economy. For the purpose of our study we consider the Greater PRD Economic Region as including Guangdong, Hong Kong, and Macao because of their close economic integration. We consider the Greater YRD Economic Region as including Shanghai, Jiangsu, and Zhejiang. Table 5.1 presents some basic economic statistics comparing the two regions for the year 2001.

Table 5.1: Major Indicators in Greater PRD and Greater YRD Economic Regions, 2001

	Hong Kong	Guangdong	Greater PRD Economic Region	Shanghai	Jiangsu	Zhejiang	Greater YRD Economic Region
Area (sq km)	1,099	179,757	180,881	6,300	102,600	103,636	212,536
Population (million)	6.71	77.83	84.54	16.14	73.55	46.13	135.82
GDP (US\$ billion)	164.0	129.0	298.8	59.8	114.9	81.5	256.3
GDP Per Capita (US\$)	24,441	1,657	3,534	3,705	1,562	1,767	1,887
Industrial Structure							
Industry (US\$ billion)	13.9	57.2	71.1	25.6	51.6	37.5	114.8
share of GDP	9%	44%	24%	43%	45%	46%	45%
Services (US\$ billion)	135.0	52.0	186.9	30.3	42.6	31.3	104.2
share of GDP	87%	40%	65%	51%	37%	38%	41%
Total Trade (US\$ billion)	391.6	176.5	572.7	120.5	51.4	32.8	204.7
Exports (US\$ billion)	190.1	95.4	287.8	68.0	25.1	23.0	116.1
Imports (US\$ billion)	201.5	81.1	284.9	52.5	29.4	9.8	91.7
Estimates of Exports ¹ Destined to and Retained Imports ² from Areas other than Hong Kong, Macao, or the Mainland (US\$ billion)							
Estimated Total Trade	104.1	167.2	271.3	57.0	48.4	31.4	136.8
Estimated Exports	47.8	91.3	139.1	25.4	26.7	21.8	73.9
Estimated Retained Imports	56.3	75.9	132.2	31.6	21.7	9.6	62.9
FDI (US\$ billion)	22.8	13.0	35.8	4.4	7.1	2.2	13.7
Other Foreign Investment, OFI ³ (US\$ billion)		1.7	1.7				
Estimated FDI Originated from Areas other than HK or the Mainland (US\$ billion)	17.9	5.7	23.6	3.2	4.1	1.5	8.9
Loans & Advances of Banks (US\$ billion)	280.2	158.2	438.4	103.2	80.6	78.3	262.1
Deposits in Banks (US\$ billion)	436.8	234.7	671.5	135.9	117.2	106.6	359.7

¹ Estimated exports from Hong Kong include domestic exports plus profit from re-exports. The latter is the product of the value of re-exports and the estimated rate of re-export margin and is estimated to be US\$34.4 billion in 2001 according to HKSAR C&SD 2002 Gross Domestic Product. The estimated profit from re-exports of Mainland origin is around 84 percent of total profit from re-exports in 1993-99 and is calculated to be US\$28.9 billion in 2001. The estimated rate of re-export margin of Mainland origin in 1993-1999 is 26.1-27.7 percent according to HKSAR C&SD Monthly Digest of Statistics July 2000.

² Estimated retained imports in Hong Kong is equal to the value of imports – [value of re-exports x (1 – rate of re-export margin)] – [value of imports from the Mainland x share of retained imports in total imports from Mainland China]. The share of retained imports in total imports from Mainland China is estimated to be 10.1 percent in 1999 according to HKSAR C&SD July 2000.

³ OFI is not included in FDI.
Source: CEIC, Guangdong, Jiangsu, Shanghai, Zhejiang Statistical Yearbooks, HKSAR Census and Statistics Department.

The Greater PRD's GDP, at US\$298.8 billion in 2001, was slightly higher than the Greater YRD's GDP, at US\$256.3 billion. The Greater PRD's per capita GDP, at US\$3,534 was higher than the Greater YRD's, at US\$1,887. In the same year, total trade in the Greater PRD amounted to US\$572.7 billion and was nearly three times that in the Greater YRD's (US\$204.7 billion). In view of the large quantity of goods that cross the borders between Hong Kong, Macao, and the Mainland, it is easy to see that official statistics pertaining to trade values are artificially inflated. One solution for the problem of double counting is to eliminate the value of traded goods and services that move between Hong Kong, Macao, and the Mainland so as to avoid artificially inflating the trade figures. But this should not be done naively, since whenever goods and services move across the border, the movement generates some additional value in the form of profits that accrue to re-exported goods. Such

values are sizable in the case of Hong Kong, because Hong Kong performs an important role as a mediator and facilitator of the movement of goods. After taking into account the profits gained from re-export activities, we estimate the total value of trade in the Greater PRD to be US\$271.3 billion, twice that in the Greater YRD (US\$136.8 billion).

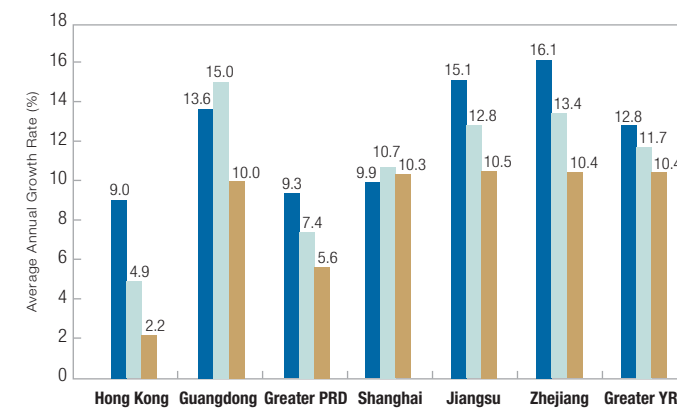
FDI inflow in the Greater PRD amounted to US\$35.8 billion in 2001, 2.5 times of the corresponding figure for the Greater YRD (US\$13.7 billion). Since Hong Kong-based companies are the largest sources of FDI inflow in both regions, and since the Mainland is a major source of FDI inflow into Hong Kong and Macao, it is useful to eliminate reported FDI flows between the Mainland, Hong Kong, and Macao to assess the amount of capital inflow from external sources. We estimate that total FDI into the Greater PRD in 2001 stood at US\$23.6 billion, nearly three times the corresponding figure for the Greater YRD (US\$8.9 billion).

By studying trade and FDI inflow figures, one can see that the Greater PRD is a far more open economic region than the Greater YRD, even taking into account the relative sizes of the two economies. Market development in the Greater PRD is also more advanced than it is in the Greater YRD, as judged by the extent of monetization of economic activities. The amount of loans and advances made by the banking sector in the Greater PRD in 2001 stood at US\$438.4 billion, which is significantly higher than the corresponding figure for the Greater YRD (US\$262.1 billion). Similarly, bank deposits in the Greater PRD stood at US\$671.5 billion, compared with US\$359.7 billion for the Greater YRD.

It is almost certain that the Greater YRD will overtake the Greater PRD in terms of GDP, given Hong Kong's much slower growth rate (see Figure 5.1). If the

Figure 5.1:
Average Annual Real GDP Growth Rates

■ 1978-1988 ■ 1989-1997 ■ 1998-2001



Source: CEIC, China Statistical Yearbook 2002, Guangdong Statistical Yearbook 2002, Shanghai Statistical Yearbook 2002, Jiangsu Statistical Yearbook 2002, Zhejiang Statistical Yearbook 2002

5.2 Industry and Services in the Greater PRD and the Greater YRD

regions' growth rates of the past 10 years were sustainable, the Greater YRD would overtake the Greater PRD in less than 5 years. And it would take less than 20 years for the Greater YRD to catch up in terms of per capita GDP. Such mechanical projections may not be justified, but the idea that the gap between the Greater YRD and the Greater PRD could rapidly narrow must be taken seriously. The Greater PRD's current lead in terms of GDP and per capita GDP may be rapidly eroding.

With the exception of Hong Kong, industrial production dominates in Guangdong, Jiangsu, Zhejiang, and Shanghai, where it contributed about 43 percent to 46 percent of GDP in 2001. The services sector contributed about 37 percent to 40 percent of GDP in Guangdong, Jiangsu, and Zhejiang. The contribution was larger in Shanghai (51 percent). In Hong Kong, industrial production in 2001 contributed only 9 percent of GDP, with services contributing 87 percent. As a consequence, the Greater PRD economy is 24 percent industry and 65 percent services in terms of GDP. This is in contrast to the Greater YRD economy, which are 45 percent industry and 41 percent services.

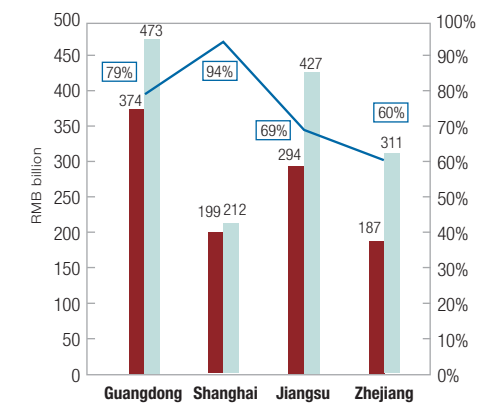
The average size of companies in the Mainland varies considerably across provinces and municipalities. Larger companies dominate in Shanghai, and smaller ones dominate in Zhejiang; Guangdong and Jiangsu are apparently

somewhere in between, according to official Chinese statistics. In 2001, industry value-added of companies with sales above RMB 5 million as a percentage of total industry value-added was 94 percent in Shanghai, 79 percent in Guangdong, 69 percent in Jiangsu, and 60 percent in Zhejiang (see Figure 5.2). Since official Chinese statistics often report only industrial company data for companies with sales above RMB 5 million, one has to exercise caution when using such figures to make industry comparisons across provinces and municipalities.

Manufacturing value-added constituted some 85 percent to 92 percent of total industry value-added in Guangdong, Shanghai, Jiangsu, and Zhejiang among companies with sales above RMB 5 million in 2001. The percentages of manufacturing value-added in total industry value-added for these

Figure 5.2:
Value-Added of Industry in Guangdong, Shanghai, Jiangsu and Zhejiang, 2001

■ (A) Value-added of State Owned Enterprises and Non-state Owned Enterprises with Annual Sales above RMB 5 million
■ (B) Value-added of Industry (GDP)
— % Share of (A) to (B)



Source: Guangdong Statistical Yearbook 2002, Shanghai Statistical Yearbook 2002, Jiangsu Statistical Yearbook 2002, Zhejiang Statistical Yearbook 2002

companies were 85 percent in Guangdong, 92 percent in Shanghai, 91 percent in Jiangsu, and 88 percent in Zhejiang (see Figure 5.3). These figures suggest that manufacturing is by far the most important sector of industry production and larger (companies and) TJT*-0.0002 Tw (that the variation

Guangdong's Top Ten Manufacturing Industries

In 2001, (Guangdon*)1 manufacturing industries contributed 68.79 percent to the total manufacturing value-added RMB317.9 billion in the province. These top 10 industries (see e 5.46), in terms of their share manufacturing value-added, were (1) the electronic and machinery industry (12.9 percent), (2) the textiles industry (9.5 percent), (3) the plastic products industry (9.4 percent), (4) the transport equipment manufacturing industry (8.20 percent), (5) the leather, furs, down, any rd

(10.1 percent), (6) the electronic equipment and machinery industry (9.1 percent), (7) the raw chemical materials and chemical products industry (8.1 percent), (8) the ordinary machinery manufacturing industry (7.1 percent), (9) the tobacco processing industry (5.1 percent), (10) the metal products industry (4.3 percent), (11) the leather, furs, down, any industry (3.7 percent), and (12) the petroleum processing and chemical products industry (3.6 percent).

Since the 1990s, FFEs have become the major driving force behind Shanghai's industrialization. The percentage contribution of FFEs to the gross industry output value was, on average, six percent in 1980-89, 57 percent in 1990-99, and 76 percent in 2000-01. FFEs played a prominent role in developing the new-technology industries, including the electronics and information technologies, the biology and medical technologies, the photovoltaic, mechanical, and electric

industries. FFEs' role in electronic and telecommunications equipment manufacturing was particularly important; they constituted some 71 percent of the value-added of Shanghai's high- and new-technology industries in 2001.

Jiangsu's Top Ten Manufacturing Industries

In 2001, Jiangsu's top ten manufacturing industries contributed 68.1 percent to the total manufacturing value-added RMB 269 billion in the province. These 10 industries (see Figure 5.6), in terms of their shares in manufacturing value-added, were (1) the textiles industry (11.8 percent), (2) the electric equipment and machinery industry (9.5 percent), (3) the ordinary machinery manufacturing industry (9.4 percent), (4) the garments and other fibre products industry (8.0 percent), (5) the raw chemical materials and chemical products industry (7.1 percent), (6) the transport equipment manufacturing industry (7.1 percent), (7) the leather, furs, down, any products industry (4.9 percent), (8) the leather, furs, down, any products industry (4.3 percent), (9) the leather, furs, down, any products industry (4.3 percent), (10) the leather, furs, down, any products industry (3.9 percent).

Zhejiang's Top Ten Manufacturing Industries

In 2001, the top 10 manufacturing industries in Zhejiang contributed 65.5 percent to the total manufacturing value-added of RMB 164 billion in the province. These 10 industries, in terms of their shares in manufacturing value-added, were (1) the textiles industry (12.9 percent), (2) the electric equipment and machinery industry (9.5 percent), (3) the ordinary machinery manufacturing industry (7.6 percent), (4) the garments and other fibre products industry (7.3 percent), (5) the raw chemical materials and chemical products industry (6.3 percent), (6) the transport equipment manufacturing industry (5.0 percent), (7) the non-metal mineral products industry (4.3 percent), (8) the leather, furs, down, any products industry (4.3 percent), (9) the non-metal mineral products industry (4.3 percent), (10) the metal products industry (3.9 percent).

The synergy between producer services in Hong Kong and manufacturing in PRD enables the Greater PRD Economic Region to maintain its competitive edge in the global market.

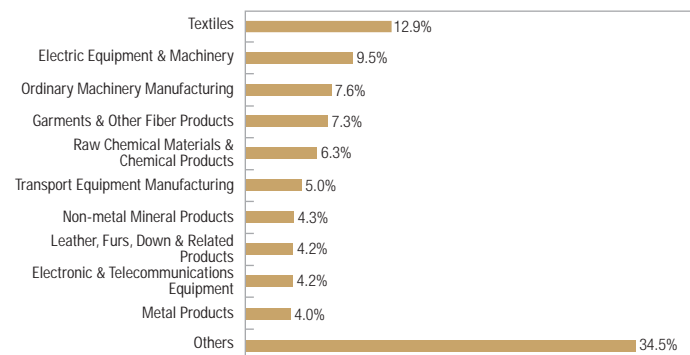
furs, down, and related products industry (4.2 percent), (9) the electronic and telecommunications equipment industry (4.2 percent), and (10) the metal products industry (4.0 percent) (see Figure 5.7).

Producer Services

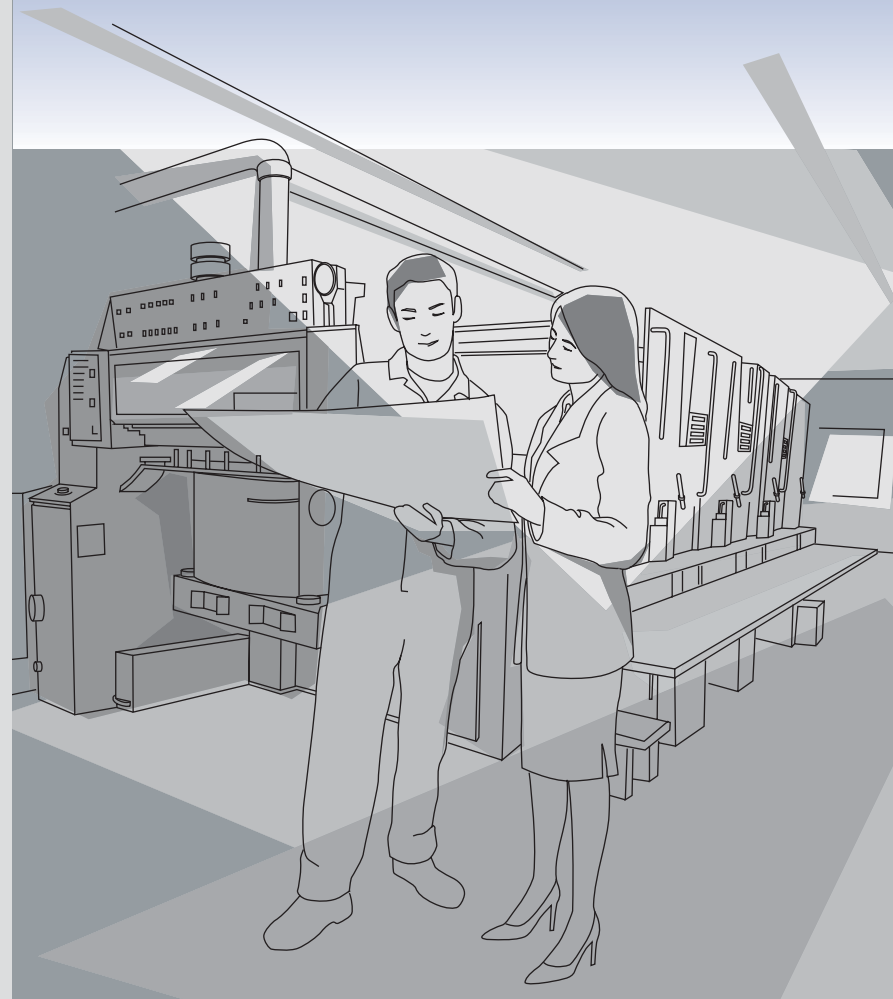
Although Hong Kong is predominantly a service economy, it is important not to lose sight of the crucial fact that a significant proportion of its services are producer services (see Table 5.2).¹ Producer services support the manufacturing industries that are located primarily outside Hong Kong and mainly across the border in Guangdong. Producer services are used as intermediate inputs in the production of other goods and services, and in contrast to consumer services, are not directly used by the final consumer. These services include services related

¹ YCR Wong, "The Growth of Manufacturing and Services in Hong Kong," *HKCER Letters*, No. 40, September 1996, pp. 1-8.

Figure 5.7:
Top Ten Manufacturing Industries in Zhejiang, 2001
(% share of total manufacturing value-added*)



* Figures cover enterprises with annual sales above RMB 5 million
Source: Zhejiang Statistical Yearbook 2002



to finance, insurance, real estate, transportation, storage, professional services, R&D, business, trading, and management. Increasing the productivity of manufacturing relies on the growth of these producer services. In the period 1985-2001, the percentage share of total services in real GDP in Hong Kong increased from 74.0 percent to 86.2 percent. The growth of total services can be accounted for entirely by the growth of producer services, which rose from 37.3 percent to 52.5 percent of GDP.² The explosion of producer

² It is important to note that we should rely on calculations based on percentage shares of real GDP and not nominal GDP to evaluate the true rise in producer services. Since consumer and government service deflators rise faster than the GDP deflator, calculations based on nominal GDP would underestimate the rise of producer services.

services in Hong Kong has enhanced the competitiveness of Guangdong's export-oriented manufacturing base and will help to transform it into a manufacturing powerhouse for supplying the Mainland's domestic needs in the future.

Mainland Service Sector Growth

In the period 1980-2001, the Mainland's service sector grew enormously. Some of this growth probably reflects the catching up of the consumer service economy after decades of suppression. Therefore, one should not assume that all the growth in services has arisen from the development of producer services. The data required to make estimates of

growth of producer services as a share of real GDP are not available for the Mainland. Using percentage shares of nominal GDP may be misleading. To arrive at some conjectures, it is best to exclude the period 1980-1990, when most of the growth in services is likely to be attributable to the catching up of suppressed consumer services.

In the period 1990-2001, the percentage share of total services in nominal GDP increased from 32 percent to 51 percent in Shanghai, 26 percent to 37 percent in Jiangsu, 29 percent to 38 percent in Zhejiang, and 36 percent to 40 percent in Guangdong (see Figure 5.8 and Figure 5.9). Over the same decade, Hong Kong's share of total

Table 5.2: Percentage Share of Manufacturing and Producer Services in Real GDP in Hong Kong, 1980-2001

	1980	1985	1990	1995	2000	2001
	Share % of Real GDP					
Manufacturing	17.1%	15.9%	17.6%	11.1%	7.2%	6.8%
Total Services	74.2%	74.0%	74.5%	81.5%	85.7%	86.2%
Producer Services	42.8%	37.3%	40.5%	48.5%	52.6%	52.5%
Consumer Services	26.7%	30.0%	28.3%	27.1%	27.5%	27.8%
Government Services	4.7%	6.7%	5.6%	5.9%	5.6%	6.0%
Others	8.7%	10.0%	7.9%	7.4%	7.1%	7.0%

Source: HKSAR 2002 Gross Domestic Product, YCR Wong, Z Tao and CS Chan, *An Economic Study of Hong Kong's Producer Service sector and Its Role in Supporting Manufacturing*, funded by Industrial Support Fund, May 2000, 112 pages, and Z Tao and YCR Wong, *Hong Kong: From an Industrialized City to a Center of Manufacturing-Related Services*, *Urban Studies*, vol. 39, no.12, 2002, pp. 2345-2358

5.3 Market Institutions and Information Aggregation

services in nominal GDP increased from 74 percent to 87 percent. This rate of service sector growth is higher than that in Jiangsu, Zhejiang, and Guangdong and is second only to Shanghai. One must note, however, that in this period service sector growth in Hong Kong probably slowed down considerably as a consequence of the adverse effects of the Asian financial crisis, which affected Hong Kong and the Mainland differently. Moreover, Shanghai's opening only started in the 1990s; hence some of the growth in services during this period may still reflect the growth of consumer services. Nevertheless, Shanghai has made impressive progress in terms of the growth of its services sector.

The question of whether the Greater YRD will become a formidable competitor of the Greater PRD must be set against the prospect of longer-term developments of market-oriented institutions. One must look beyond economic size and growth trends. As illustrated in chapter 3, Hong Kong based companies consider a friendly business environment as essential to their economic future. Hong Kong is still regarded today as the world's freest economy because of its market institutions. The Heritage Foundation and the Fraser Institute have consistently rated Hong Kong ahead of any other economy in the world in this respect. The Mainland's ratings have been improving but are still in the lower quartile in world rankings.

Within the Mainland, the pace of market-oriented institutions' development in Guangdong, Jiangsu, Zhejiang, and Shanghai is decidedly above the national average. Professor Fan Gang and his colleagues at the National Economy Institute of the China Economic Reform

Research Foundation have constructed an index of the development of market institutions at the provincial level, including the directly administered municipalities of Beijing, Tianjin, Shanghai, and Chongqing (see Figure 5.10). The leading province is Guangdong. Zhejiang is ranked second, Jiangsu ranked fourth, and Shanghai sixth. Shanghai's score in 1999 was 6.59 out of a maximum score of 10; Guangdong's score was 8.33. Hence, within the Mainland, the gap between the first and the sixth position is significant. The ratings applied by the China Economic Reform Research Foundation are not directly comparable with those applied by the Heritage Foundation and the Fraser Institute. But it is reasonable to surmise that if the same scoring system were to be applied to Hong Kong, then Hong Kong would receive a 10. The Greater PRD may have an advantage in terms of the maturity of its market institutions, especially considering the presence of Hong Kong there; however, one must note that the Greater YRD is close

behind Guangdong in terms of market development and will be a very contender for attracting both domestic and foreign investments. Guangdong's and Hong Kong's ability to work closely together to leverage each other's comparative advantages and to sustain Guangdong's continued market reforms will be critical for success in the face of the challenge posed by the Greater YRD.

Market institutions are particularly important to small and medium-sized companies because these companies lack the ability of larger ones to negotiate private contracts with government authorities to protect their business investments. Large trans-national companies (TNCs) that invest in developing and transitional economies where market institutions are weak can sometimes succeed in extracting state guarantees to partially mitigate contractual risks. Unfortunately, small and medium-sized companies cannot do this. As a consequence, small and

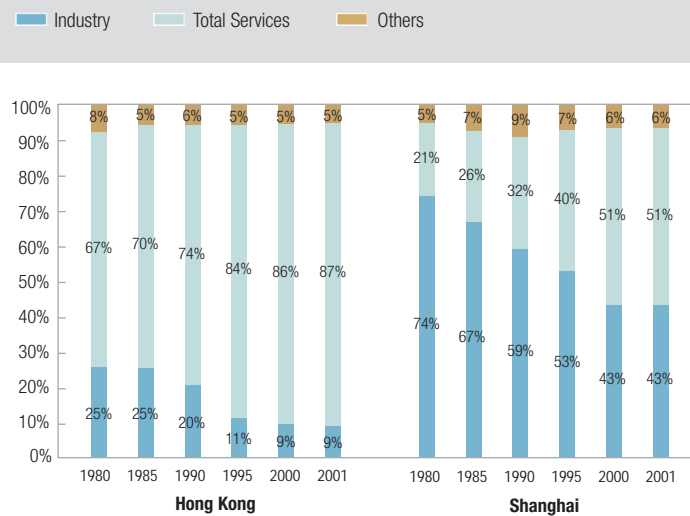
medium-sized companies do not invest heavily in economies with weak market institutions. And oftentimes the presence of foreign investments succeeds in creating little more than enclave economies.

The Mainland's accession to the WTO has raised the hope that new business opportunities will arise as a result of the creation of an environment that will be friendlier for companies of all sizes. But the cost of market entry and of doing business for small and medium-sized companies remains high in the Mainland's developing and transitional economy. The Mainland's market is alluring but high risk. For small and medium-sized companies that are contemplating entering the Mainland market, Hong Kong provides a unique platform to help mitigate some of those risks. In addition to offering a familiar business environment that is supportive of doing business in the Mainland, Hong Kong has over 100,000 companies that have experience doing business there. This means hundreds of thousands of executives and workers in Hong Kong

have vast stores of knowledge about the Mainland market and many other Mainland institutions. The wealth of knowledge that is concentrated in Hong Kong is unrivalled and is unlikely to be rivalled in the future. This makes the Greater PRD attractive to small and medium-sized overseas investors.

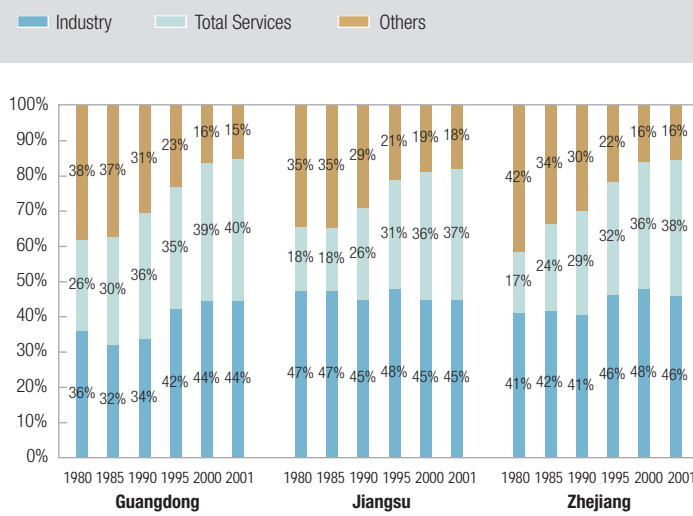
At a deeper level, markets function well when they are supported by rule-based institutions that allow information to flow through them unfettered. Markets perform an information aggregation role. Hong Kong is the information node for the Mainland economy as a whole. It is arguable that the best market information about Beijing is in Beijing, the best market information about Tianjin is in Tianjin, the best market information about Chongqing is in Chongqing, and so on. But information about specific markets in the Mainland is second-stage knowledge. For businesses, first-stage knowledge starts with the Mainland economy as a whole. Such information is less likely to be obtainable in any city in the Mainland owing in part to the fragmentation of the Mainland's market and, hence, of its information networks.

Figure 5.8: Hong Kong and Shanghai – Industry and Total Services as % of Nominal GDP, 1980-2001



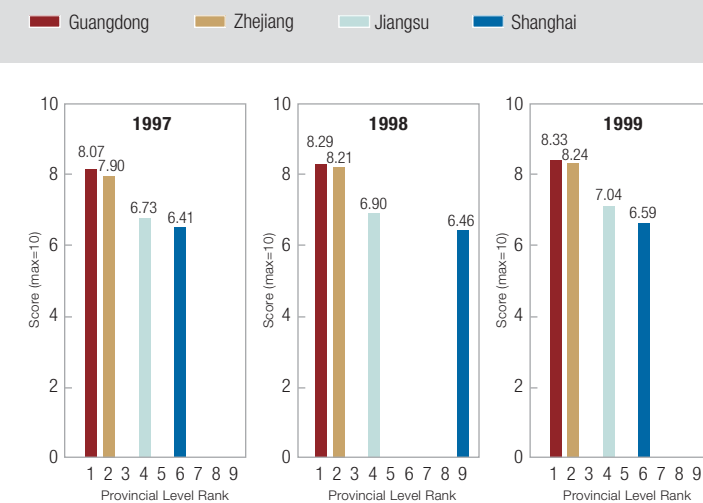
Source: 2002 Gross Domestic Product (HK), Shanghai Statistical Yearbook 2002

Figure 5.9: Guangdong, Jiangsu and Zhejiang – Industry and Total Services as % of Nominal GDP, 1980-2001



Source: Guangdong Statistical Yearbook 2002, Jiangsu Statistical Yearbook 2002, Zhejiang Statistical Yearbook 2002

Figure 5.10: Index of Market Development, 1997-1999



Source: Fan Gang et al., China Market Development Index, National Economy Institute, China Economic Reform Research Foundation, 2001.

Chinese businesspeople have been coming to Hong Kong to explore opportunities outside the Mainland. International businesspeople have been coming to Hong Kong to explore opportunities within the Mainland. Everyone who comes to Hong Kong to obtain information brings information to Hong Kong, and by so doing further enhancing the role of Hong Kong as an information hub. The first-mover advantage in the creation of an information hub is enormous because the economies-of-scale and economies-of-scope characteristics of information networks are in operation.

Once an information hub has been created for the Mainland market, it is reasonable to expect that it may evolve into an information hub for other markets by virtue of the forces of economies of scope. Hong Kong therefore has the distinct advantage of being a gateway not just to the Mainland but also to the rest of Asia. As businesspeople from different parts of the world come to seek information, they bring information about opportunities from different parts of the world to Hong Kong.

In this respect Hong Kong's present advantage over Shanghai in attracting small and medium-sized TNCs still exists and will remain for the near future. As the Mainland's markets become further liberalized and less fragmented, Shanghai will certainly become more attractive to such companies. The hope is that by then Hong Kong will have become an even more formidable information hub. The role of Hong Kong as the Mainland's information hub is already reflected in the way some TNCs are devising their own Mainland strategies. A growing number of Hong Kong based companies have moved their Mainland division from Hong Kong to Shanghai as their Mainland headquarters. But they have kept their regional headquarters for the Asia-Pacific region in Hong Kong.

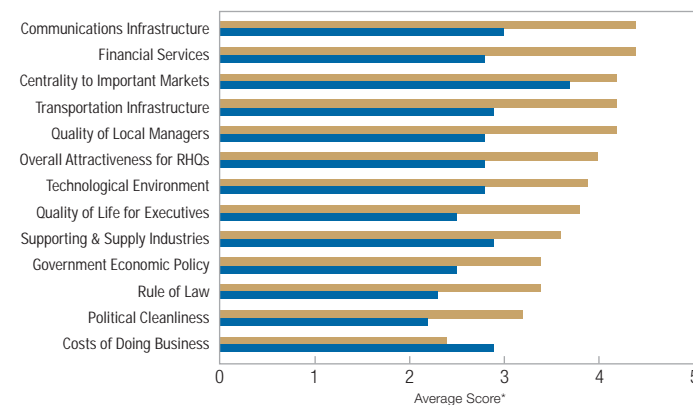
In a survey conducted by the University of Hong Kong in 1998, TNCs ranked Hong Kong higher than Shanghai as a place in which to locate regional headquarters, almost with the exception of the cost of doing business (see Figure

5.11). With the Mainland joining the WTO, Shanghai is likely to move forward in terms of its centrality to the market, but its rankings for other categories are unlikely to change.

Some TNCs may choose Shanghai as a base for managing their Mainland manufacturing operations, particularly if their businesses are physically concentrated in the Greater YRD. The importance of Hong Kong for TNCs' manufacturing operations in Guangdong is likely to increase with the emergence of a new breed of smaller TNCs. These TNCs will have a strong interest in investing in the Mainland. But their relative lack of experience in the Mainland market and their leaner corporate structures make Hong Kong attractive to them. Whether they will prefer the Greater PRD over the Greater YRD will also depend on how the business environment in Guangdong improves relative to those in Shanghai, Jiangsu, and Zhejiang and on how effective economic integration within the Greater PRD is in the coming years.

Figure 5.11:
Attractiveness as Regional Headquarters in the Future

■ Hong Kong ■ Shanghai



* 1=Very unimportant; 2=Slightly unimportant; 3=Neutral; 4=Slightly important; 5=Very important.
Source: Michael Enright and Edmund Thompson, University of Hong Kong, 1998.

5.4 The Role of Hong Kong and Shanghai in their River Deltas

It is important to recognize that Hong Kong's role in Mainland trade goes beyond entrepot trade, or being a middleman. A close examination of recent trade statistics points to Hong Kong's critical role in the Mainland's development and in export trade in particular. Recent figures from the Mainland's customs show the relative contributions to exports from domestic companies and FFEs. In 2001, the total value of exports produced by FFEs exceeded the value of exports produced by the entire domestic industrial sector for the first time since 1992.

In other words, FFEs are the main driving force in generating exports for the Mainland, and data show that they saw exports grow by 25 percent per annum between 1993 and 2001. Compare this with domestic companies,

where compound growth has been at about 7.8 percent (see Table 5.3). The largest investors in the Mainland's FFEs are from Hong Kong. The amount of each investment was relatively small and thus did not attract much media attention. The largest portion of investments was made in Guangdong. In 2001, Guangdong received US\$15.7 billion in FDI. Investments from Hong Kong based companies accounted for 60 percent of the total in 2001.

Table 5.3: The Mainland's, Guangdong's, and the Greater YRD's Export Value in US\$ billion, 1990-2002

	China		Guangdong		Shanghai, Jiangsu and Zhejiang	
	Domestic Enterprises	Foreign Enterprises	Domestic Enterprises	Foreign Enterprises	Domestic Enterprises	Foreign Enterprises
1990	54.3	7.8	16.7	5.5	9.6	0.9
1991	59.8	12.1	19.1	7.9	10.0	2.1
1992	67.6	17.4	22.7	10.8	10.9	3.9
1993	66.5	25.2	23.0	14.4	11.3	6.3
1994	86.3	34.7	30.4	19.8	17.6	7.5
1995	101.9	46.9	30.8	25.8	25.5	7.1
1996	89.5	61.5	28.7	30.7	25.7	11.3
1997	107.9	74.9	37.8	36.8	26.9	14.4
1998	102.8	81.0	36.4	39.2	23.7	18.8
1999	106.3	88.6	38.3	39.4	27.4	22.5
2000	129.8	119.4	42.4	49.5	36.5	34.1
2001	132.8	133.3	41.5	54.3	40.8	39.7
2002	155.6	170.0	49.5	69.7	49.0	52.6

Source: Customs, China

Mainland customs figures indicate that FFEs form the most vibrant part of the Mainland's export-oriented production capacity. Hong Kong businesspeople and those from the overseas Chinese community by and large own most of these FFEs. To date, these FFEs have been able to grow without a "home market" (i.e., without selling to the domestic Mainland markets and they have had to deal with bureaucratic problems as well as poor transportation infrastructure.

Guangdong has been the recipient of the lion's share of Hong Kong based companies' investments. Over the past

two decades, Hong Kong manufacturers have helped to turn Guangdong into a substantial production base for myriad products for the world market. The growth of the manufacturing base in Guangdong has in turn transformed Hong Kong into a service economy. The dominant economic activity in Hong Kong consists of producer services that support the manufacturing base across the border. Hong Kong's service economy accounts for more than 82.3 percent of GDP today, and this is in sharp contrast to Shanghai's much smaller service economy (see Table 5.4).

▼
Hong Kong provides higher-end value services and does not compete with the Mainland in the areas of land and labour.

Table 5.4: Service Sector Indicators for Hong Kong and Shanghai, 2001

	Hong Kong	Shanghai
<i>Service Sector (% share of GDP)*</i>	<i>82.30</i>	<i>50.69</i>
Financial Service	11.57	12.52
Wholesale, Retail and Import/Export	25.05	11.12
Transportation and Communication	10.05	6.97
<i>Service Sector (% share of employment)</i>	<i>81.01</i>	<i>47.21</i>
Financial Service	5.45	1.47
Wholesale, Retail and Import/Export	30.17	13.54
Transportation and Communication	10.87	4.28

* GDP and GDP by Economic Activity 2001 are based on the 2000 constant prices. Data on financial service exclude real estate and business service.
Source: Hong Kong Annual Digest of Statistics 2002, Shanghai Statistical Yearbook 2002

Hong Kong entrepreneurs supply the capital and expertise needed to efficiently use production inputs across the border. This is an ideal partnership, and it will only improve even further if the Greater PRD Economic Region can become a more efficient manufacturing base, R&D centre, and producer services hub for managing the global supply chain for manufactured products.

It must also be noted that as the supplier of producer services to support manufacturing production in the Mainland, Hong Kong has no competitors. This is especially true for trade-related services, since many of the services are provided by a parent company in Hong Kong to its subsidiaries, affiliates, and subcontractors in the Mainland. Moreover, proximity of location and the presence of an excellent and improving infrastructure make Hong Kong the Greater PRD Economic Region's greatest asset.

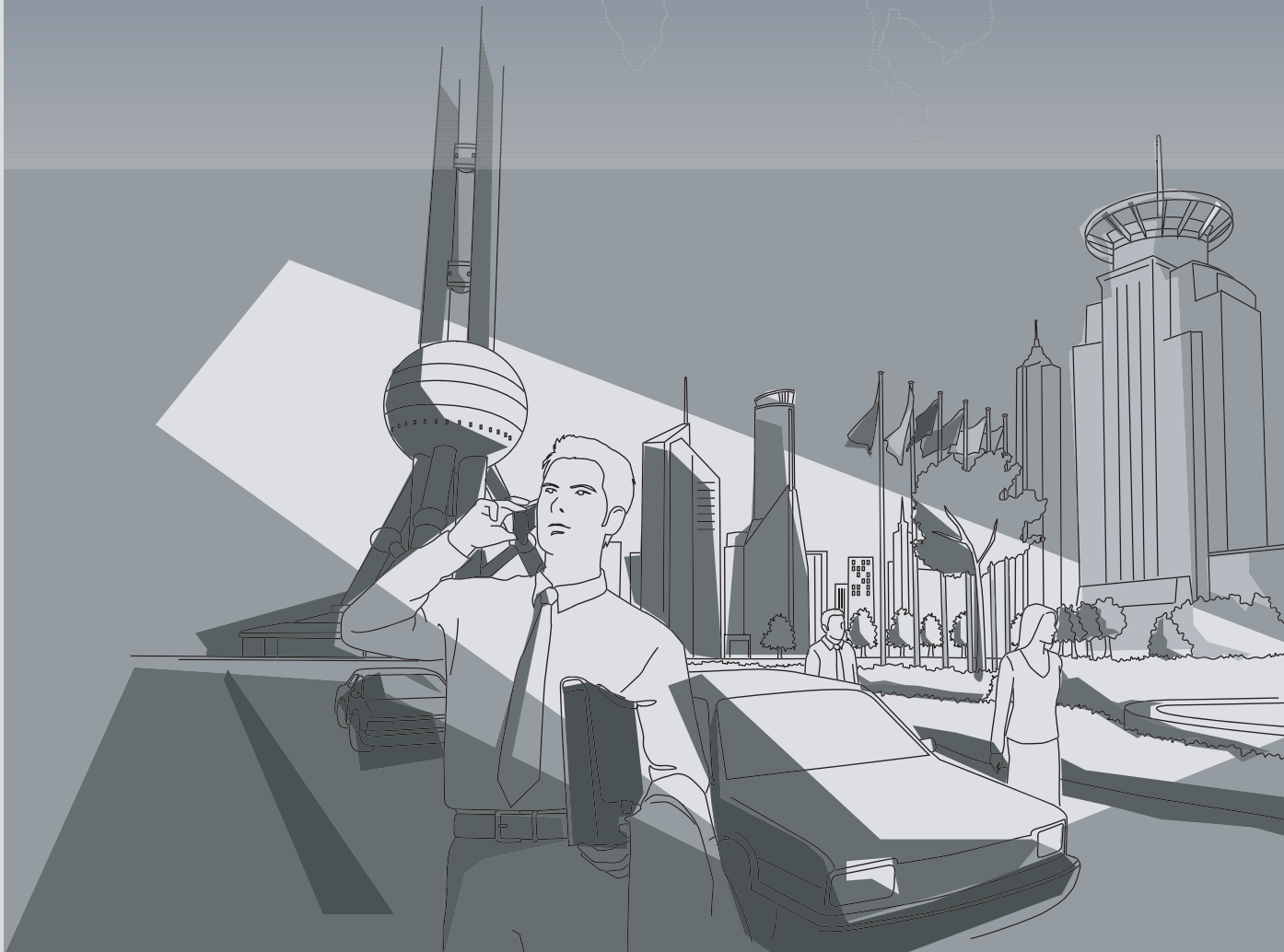
Both the Greater PRD Economic Region and the Greater YRD Economic Region economies are vibrant regional economies. Both are important manufacturing bases and serve as important export platforms. Guangdong is serviced primarily by Hong Kong, and Jiangsu-Zhejiang is serviced by Shanghai. The main difference is that the majority of the factories in Guangdong are owned by Hong Kong based companies, whereas those in Jiangsu-Zhejiang are owned by companies that are based in Shanghai but that are not originated from there. Given that Shanghai's producer service economy is not as well developed as Hong Kong's, Hong Kong based companies may still have an opportunity to contest that market. To do so they would have to set up operations in the Greater YRD, perhaps managed directly from Shanghai.

5.5 Summary Remarks

The Greater YRD and The Greater PRD are two of the most vibrant economies in the Mainland today, but they do not necessarily compete with one another for everything. As a manufacturing base in its own right the Greater YRD presents an opportunity for Hong Kong based companies to establish production operations there as well. Particularly attractive is the Greater YRD's considerable endowment of human resources and also its improving market-oriented business environment. Because Shanghai is a long distance from Hong Kong, to exercise effective management control of many manufacturing operations in the Greater YRD, it may be necessary to establish a head office based in Shanghai. An obvious advantage of the Greater YRD is the absence of an artificial border limiting human resource flows between the city and its hinterland; a factor that restrains Hong Kong's interactions with Guangdong. While location works in favour of the Greater PRD, in the end what matters most is the total cost of doing business.

The Greater PRD remains attractive because of its proximity and cultural ties to Hong Kong. Its rapidly improving human resource pool drawn from migrant inflows makes it comparable to the Greater YRD as an economic power base for providing highly skilled talent to facilitate R&D investments. Should Hong Kong succeed in tapping this pool of talent through more flexible entry permits for R&D and managerial staff to work and live in Hong Kong, there might be considerable room for manufacturers to invest in technological innovation and move up the value chain. Hong Kong has excellent universities that can help upgrade scientific, technological, and management manpower needs in Guangdong. Enhanced transport and border linkages will facilitate the flow of goods and people and enhance the Greater PRD's competitiveness. The much-discussed bridge connecting

Instead of competing with the Greater PRD, the rapid growth of the Greater YRD will generate and offer many new business opportunities for Hong Kong companies to increase their market share.



Hong Kong, Macao, and the Western part of the PRD could help create a better-integrated region and lower the cost of doing business to a part of the PRD that can be further developed. There is also a continual need to improve the market-oriented business environment in Guangdong to sustain its further development.

Last but by no means least is the fact that Hong Kong is one of the Greater PRD's most valuable assets, because Hong Kong is the ideal location for a head office from which to control financial and management operations. This has been confirmed in our interviews with entrepreneurs and in earlier surveys.

The advent of atypical pneumonia, also known as severe acute respiratory syndrome, that struck the region suddenly in spring 2003 has highlighted the value of a separate jurisdiction in Hong Kong that is separate from the rest of the Mainland, which in this instance serves to lower the cost of running manufacturing operations in the

Mainland from a head office maintained in Hong Kong. Reported figures indicate that there has been no disruption in the operations of the international supply chains of which the Greater PRD is a part.

At present, Hong Kong is Shanghai's largest foreign investor, accounting for 42 percent of total accumulated FDI inflow. Hong Kong entrepreneurs have shared their management expertise and business experience with Shanghai through broad-based investment in manufacturing, financial services, transport, infrastructure, real estate, and wholesale and retail trade. This means that the Greater YRD is attractive to Hong Kong companies in other ways besides as a manufacturing base. It may be possible that in the long run a diverse set of Hong Kong companies could benefit substantially from a rapidly growing Jiangsu and Zhejiang and from the rise of Shanghai.

Chapter 6

Policy Implications and Recommendations

6.1 Hong Kong's Role and Policy Aims

Hong Kong based manufacturers and importers-exporters operated 59,000 factories and employed over 11 million workers in the Mainland in 2002. In Guangdong they operated 53,300 factories and employed 10 million workers. Most of the manufacturing operations in the Mainland were either foreign funded enterprises or “three forms of processing/assembly operations and compensatory trade”. The latter is an overwhelmingly Guangdong-specific phenomenon. Both manufacturers and importers-exporters engage in subcontracting arrangements, but this is less common than owning or managing production facilities across the border.

Half of the companies registered as importers-exporters in Hong Kong have production operations in Guangdong. They are traders in Hong Kong but manufacturers across the border. The extensive cooperation between Hong Kong and Guangdong reflects the deep and broad engagement that companies have with the economy across the border. The partnership between Hong

Kong and Guangdong is an evolving one that has responded to shifting global market opportunities and local business environments.

The growth of manufacturing operations across the border has quickly made Guangdong one of China's leading industrializing provinces. This growth has transformed Hong Kong's industrial and employment structure from one focused on manufacturing to one focused on producer services. The growth of producer services is thought to be responsible for keeping one million jobs in Hong Kong not counting jobs directly connected to manufacturing production or trading activities. Prime examples of such jobs are those in the areas of logistics and business and professional services.

Altogether a total of 1.5 million workers, approximately 43 percent of the workforce in Hong Kong today, are engaged in activities that support manufacturing activities in the Greater PRD and the rest of the Mainland. About half a million workers are directly engaged in the manufacturing and

Half of the companies registered as importers-exporters in Hong Kong have production operations in Guangdong. They are traders in Hong Kong but manufacturers across the border.

import-export sectors, and one million indirectly in supporting producer services. The producer service sector in Hong Kong thrives on the cross-border manufacturing operations and in turn enhances the overall productivity of the manufacturing activities across the border. The partnership between Hong Kong and the Mainland is one often characterized by the phrase, “front-end shop and back-end factory”, but Hong Kong plays much more than a simple merchant role. It owns and manages a substantial slice of the export-oriented manufacturing productive capacities in the Mainland.

From an economic perspective, the partnership involves an elaborate division of labour between a producer service hub in Hong Kong and a manufacturing base in Guangdong; together, the two constitute the core elements of global supply chains managed by Hong Kong based companies. This is Hong Kong's basic business model. It is a model built on the shortening cycle time for production

and business. The key elements of a shortening cycle time are responsiveness to market demand, staying at the forefront of just-in-time production and delivery, fostering and reaping the benefits of clustering effects embedded in the entire supply chain, and making sustained innovations in product development.

In the 20 years following China's opening, this model has been hugely successful. It builds on Hong Kong's and East Asia's early successes as export-oriented industrial economies. The model has continued to thrive after the Asian financial crisis hit in 1997. Hong Kong's future prosperity will depend to a large extent on enhancing the elements that have made this business model work.

The Hong Kong-Guangdong partnership's centre of gravity is shifting towards Guangdong as a range of producer services are transferred across the border. However, Hong Kong can still retain core services that drive and manage the global supply chains, like

headquarter functions, information flows, financial management, sales and marketing, and R&D activities that are intellectual property rights sensitive. This has been confirmed by our survey findings.

Hong Kong based companies plan to expand the scale, scope, and range of their activities across the border in response to the improving business environment in Guangdong, the availability of talent and skills at competitive wages, and the increasing integration of the two locations, all of which make the division of labour between producer services and manufacturing operations less dichotomised over a wider range of company functions.

One should not conclude from the shifting balance in the division of labour that Hong Kong is bound to “lose” to Guangdong, in spite of the fact that entrepreneurs and workers see lost opportunities and jobs and naturally conclude, as our survey findings confirm, that their greatest competition comes from the Mainland.

The solution is not to arrest the process. In any case, this cannot be done without other dire consequences. The challenge is to further leverage the platform that has already been created. First, Hong Kong should scale up activities in the Greater PRD. Second, it should enhance the value-added proportion of the global supply chain that is naturally based in Hong Kong and is Hong Kong's competitive advantage. Third, it should use the Greater PRD platform to leverage the rest of the Mainland, including the Greater YRD and beyond, both as a production base and as a market. If Hong Kong is ready to meet these challenges then Hong Kong's loss is not Guangdong's gain. It is everybody's gain.

There are many areas in which Hong Kong's competitive advantage cannot and will not be taken over by Guangdong or the Mainland in the short run and, in some cases, even in the longer run. Moreover, competitive advantage is not static and can be augmented through investments and policy actions. The key finding of this

study is that Hong Kong's business model is robust, and its continued vitality is essential to the future of Hong Kong and to creating employment in Hong Kong and across the border. Authorities in Hong Kong and those across the border should adopt economic policies (or industrial policies) with the sole aim of furthering cooperation between Hong Kong and the Mainland so as to enhance the overall competitiveness of manufacturing-related activities in the Greater PRD and beyond. Encouraging enhanced cooperation between the two and building on their respective competitive strengths will attract more investments to the region and will foster new higher value-added activities to the benefit of all. Hong Kong has much to offer to the rest of the world in terms of knowledge of and ability to manage the risks of global supply chains that are linked to or anchored in the Mainland.

The HK/Guangdong partnership involves an elaborate division of labour between a producer service hub in Hong Kong and a manufacturing base in Guangdong; together, the two constitute the core elements of global supply chains managed by Hong Kong based companies.

6.2 Increasing the Competitiveness of Manufacturing in Greater PRD

Maintain a Good Business Environment in Hong Kong

Our survey of Hong Kong based companies reveals that the five most important actions these companies think the Hong Kong SAR Government should focus their efforts on are (1) maintaining a good business environment, (2) coordinating Hong Kong's infrastructure development with the Mainland, (3) providing assistance to Hong Kong companies encountering commercial disputes in the Mainland, (4) strengthening R&D capabilities, and (5) attracting multinational companies to set up production facilities in Hong Kong (see Figure 6.1).



Our survey findings reveal that most Hong Kong based companies were satisfied with Hong Kong's business environment. Sixty-one percent of the companies surveyed indicate that this is the single most important aspect of Hong Kong's competitiveness. Ninety percent indicated that this was one of

the five most important policies for Hong Kong. For them the ingredients of a good business environment are a simple tax system with low tax rates, the absence of foreign exchange controls, the free flow of information, free trade, the rule of law and an independent judiciary, political stability and good security.

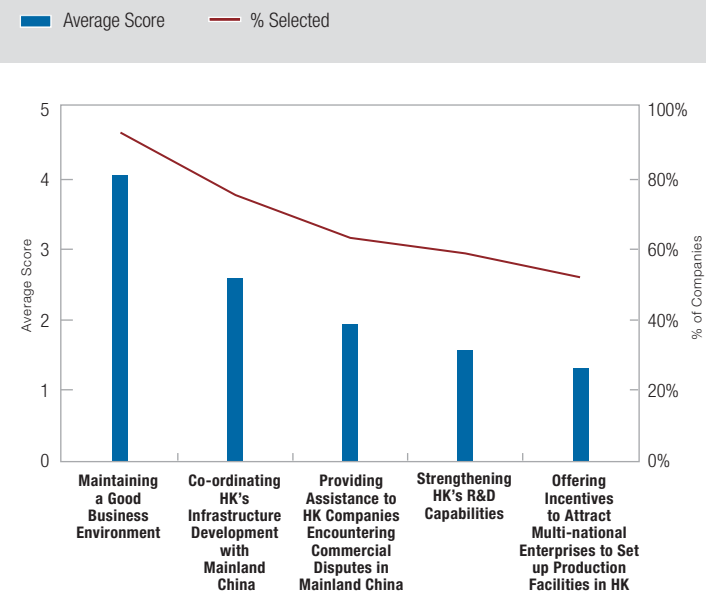
Most of the companies surveyed were not satisfied with Hong Kong's industrial policy. Many believed that manufacturing in the Greater PRD was fundamental to Hong Kong's long-term economic development. They wanted to see the government coordinate their policies in the Greater PRD to enhance the competitiveness of the region more effectively. It was far more important to keep the larger picture in perspective than to pursue specific technology and other related targets. Some manufacturers believed that a technology focus to develop leading-edge industries in Hong Kong failed to

grasp that the overwhelming proportion of the industries in the region aimed to be the best in their class of products worldwide rather than striving to be at the leading edge of technology. For these manufacturers the key issue was shortening the cycle time of an integrated supply chain that they were managing through establishing better integration with Guangdong.

Cooperation in Infrastructure Development and Setting Rules and Regulations

All the companies surveyed looked forward to closer cooperation between Hong Kong and Guangdong to facilitate Hong Kong based companies' ability to operate in the Mainland. According to the companies, the movement of goods by land across the border is the single most important feature that has to be addressed. The financial losses due to frequent custom delays and traffic congestion, both expected and unexpected, impose a heavy burden on operating cross-border manufacturing operations and result in billions of dollars in annual losses. Two-thirds of the

Figure 6.1: Five Most Important Policy Actions for Hong Kong



companies surveyed indicated that they had experienced delays and congestion when moving goods across the border.

Improved coordination in the development of basic infrastructures (e.g., roads, bridges, border checkpoints) to speed up the flow of goods and the clearance of customs is urgent. The real losses are not limited to direct financial outlays but extend to lost opportunities and missed investments. Reducing custom delays and traffic congestion would decrease expected and unexpected losses and would strengthen the competitiveness of the Greater PRD, yielding tens of billions of dollars each year in additional earnings.

Our study confirms that most of the manufacturing operations across the border are overwhelmingly concentrated in the eastern part of the Greater PRD. The western part is seriously underrepresented. A bridge link to the West would create new opportunities for investment and expand existing land

access. Perhaps the most important feature of a bridge link to the western part of the Greater PRD is that it would facilitate further integration of the region and would spread economic development to a larger population base.

The issues relevant to speeding up the flow of goods across the border also involve facilitating arrangements for customs and immigration matters at the border crossing. Proposals like joint customs inspections and dispersed inspections at locations other than the border crossing (using sealed container boxes) should be actively pursued.

Other regulatory regimes in place in the Mainland that require factories to clear customs in their local cities; to submit applications for moving goods across the border three days in advance; and to insist on a rigid system of requiring the same container driver, container truck, container box, and container chassis to cross border as a single unit all

contribute to higher costs and delays. Relaxation of some of these rules and regulations would reduce costs and delays.

Establishing a Special Public Agency for Aggregating Common Concerns and Mediating with Mainland Authorities

There is a need to establish a special public agency to collect, consolidate, and convey common concerns to Mainland authorities in Beijing, the provinces, and key local districts. Such an agency would afford all companies, especially small and medium-sized ones, an efficient and convenient avenue by which they could express their views. Establishing such an agency would help improve the business environment in Guangdong and the rest of the Mainland.

The Taiwan Electrical and Electronic Manufacturers' Association, the largest industrial association in Taiwan, has conducted the Mainland China's Investment Environment and Risks Survey on a yearly basis since 2000 and has been releasing their findings since

that year. These surveys provide a useful collective platform to guide companies in their investment decisions. More importantly, the surveys provide Mainland authorities with feedback from investors to assist them in improving the business environment.

A special public agency could fill such a role even more effectively. The establishment of such an agency would increase Mainland authorities' awareness of suggestions that would help them enhance their business environment and attract more foreign investments. Maintaining Guangdong's lead and maintaining sustained economic development after China's accession to WTO are issues that Guangdong's leadership will have a keen interest in as competitive pressure mounts.

Strengthening R&D Capabilities in Hong Kong

Most of the companies surveyed indicated that they plan to enhance their

investments in R&D. Their current R&D expenditures are not significant, standing at about one to two percent of turnover. Many small and medium-sized companies in Hong Kong simply do not have the capacity to plan for long-term investment in R&D. Furthermore, given the risks and costs of R&D investments, it does not appear that pursuing such activities in Hong Kong will be profitable for small to medium-sized companies. Many companies are planning to move R&D activities into Guangdong, where costs are lower. Given its 20 years of industrialization experience, Guangdong has attracted a substantial pool of educated workers through inward migration from the rest of the Mainland, which makes it increasingly likely that companies will be successful at recruiting suitable R&D staff in Guangdong.

Companies that plan to increase their R&D activities in Guangdong are primarily interested in starting development work rather than research work there. The inadequate protection of intellectual property rights in the

Mainland discourages Hong Kong based companies from locating sensitive R&D activities there. For development work, the problem of intellectual property rights protection is less serious, because of the short life cycle of products nowadays.

The existing situation poses some interesting possibilities for cooperation between Guangdong and Hong Kong. The legal and enforcement framework for protecting intellectual property rights is much better developed in Hong Kong. The research capabilities and technological resource base in the universities in Guangdong and Hong Kong are also quite substantial, although they have not been effectively tapped for applied and development work. The recent outbreak of atypical pneumonia (or SARS) in Guangdong and Hong Kong has shown that, if called upon, local universities can use their considerable research capabilities to serve the community. Hong Kong faces a shortage of talented professional

and technical staff that is willing to work on R&D activities, given the incentive structure. However, Guangdong has a considerable supply of such talent, many of whom were attracted to the area because of the growing economic opportunities.

It appears that there is an opportunity for the two governments to work together to facilitate the development of technology-intensive R&D activities by combining the strengths that each place possesses. This would entail the facilitation of the movement of R&D staff between Hong Kong and Guangdong so that they can work on R&D projects that meet the demands of the world market and simultaneously inform the production processes in Guangdong. It would also require facilitating arrangements to encourage cooperation between industry and universities. Finally these R&D activities can be located in Hong Kong so that investors will be assured of protection of their intellectual property rights.

Training, Education, and Admission of Talent and Professionals from the Mainland

Most of the companies surveyed were concerned about the lack of relevant expertise suitable for the manufacturing industry in Hong Kong. The government should make provision to train and educate local talent and to allow more professionals from the Mainland to work in Hong Kong. Hong Kong must win the war for talented people if it is to maintain its position in managing the global supply chains that are linked to the region.

Training and education of local staff and students should focus on relevant needs and should strengthen these staff's and students' ability to work on both sides of the border. Practical training with attachments in factory facilities across the border should form part of the learning process. Factory-based internships are useful for engineers and technologists, given that production facilities are no longer located in Hong Kong. They are also relevant for those who aspire to be managers. Training and education curricula should

develop a regional perspective and should include immersion programs that familiarize staff and students with economic activities across the border.

The admission of talent and professionals is an established policy in Hong Kong, but the actual numbers that have been admitted are still limited. Given the further relaxation of admission criteria and streamlining of application procedures, it is expected that much larger number of talent and professionals will be admitted into Hong Kong in the near future. A more relaxed policy on admitting talent and professionals from the Mainland is critical if Hong Kong is to develop a substantial R&D capability. More interactions between Hong Kong and Mainland professionals could bring out the best qualities in both and could strengthen Hong Kong's and the Mainland's competitiveness in the long run.

The idea of admitting more talent and professionals into Hong Kong is largely

Training and education of local staff and students should focus on relevant needs and should strengthen staff and students' ability to work on both sides of the border.

conceived of as a policy that brings residents into Hong Kong through one-way permits. An important dimension of the Hong Kong-Guangdong partnership is that it needs managerial, technological, sales, and R&D personnel to flow efficiently between the two places. For this reason, convenient long-term arrangements for two-way permits for managerial and technical staff in Guangdong should be introduced. As Hong Kong's partnership with the Mainland is also expanding beyond Guangdong, similar arrangements for other provinces should be introduced as soon as possible as well, particularly for provinces in the Greater YRD, where Hong Kong investments are already substantial and are likely to increase.

Business Environment in Guangdong

According to our survey, Hong Kong based companies felt that the business environment in Guangdong has continued to improve, although they had various complaints. In general, they were quite satisfied with the available infrastructure and the functioning of

production operations. They felt that supporting services were also getting better. They were least satisfied with government policies and legal protection. Most disputes were mainly related to government policies - customs and government fees and charges - and few were related to business partners, distributors, suppliers, or clients. The estimated losses from disputes were substantial.

One of the companies' complaints related to the significant differences among local government policies and regulations in Guangdong, including investment regulations, rules for taxation, charge provisions, and restrictions on the number of times a commodity can be transferred between factories. Local governments often established their own charges and regulatory specifications. In addition to being complicated, many local government policies and regulations were constantly changing. One of the interviewed companies indicated that it

had to relocate its production plants 30 times owing to changes in local policies and regulations. Nevertheless, the companies felt that the transparency of government policies and regulations was improving.

Creating a better business environment through greater transparency of government policies and regulations and a more uniform set of regulations, fees, and charges throughout Guangdong would benefit both Guangdong and foreign investors. Interestingly, the current business environment provides Hong Kong entrepreneurs with a unique advantage, as they possess highly valuable specific information that they can use to mitigate their own investment risks. Nevertheless, the best solution would be to provide a common and clear set of policies and regulations. This should be an important goal for enhancing the competitiveness of the Greater PRD, especially after China's accession to the WTO.

Attracting Multinational Companies to Hong Kong

Bringing small and medium-sized multinational corporations to Hong Kong would help further solidify the global supply chains managed through Hong Kong. Such small and medium-sized multinational corporations also bring information, technology, and know-how, but they may lack the requisite global reach to come to the Greater PRD. The Mainland has an abundance of skilled and non-skilled manpower and a growing market for products. Hong Kong's favourable business environment and the knowledge and expertise of local companies in managing operations in the Mainland are Hong Kong's greatest assets in furthering the development and leveraging the existing Greater PRD platform. The attributes should be brought to the attention of small and medium-sized multinational corporations.

The portrait of a vibrant region should be promoted to the rest of the world, especially in the wake of the outbreak of atypical pneumonia (or SARS) in the region, which may have resulted in

uncertainty in the minds of foreign investors. The fact that global supply chains have not been disrupted despite the ravaging effects of the disease, which has galvanized world headlines, should be clearly conveyed to chief executives of prospective multinational companies that have an interest in the region and also to those that already have operations here.

Promoting the region as a whole should be a cooperative effort involving authorities and businesses in both Hong Kong and Guangdong, and even those in the Greater YRD. As Hong Kong becomes increasingly integrated with the region, the message to be delivered has to be a regional one as well. The branding of the region, with Hong Kong as the producer services centre for managing interacting global supply chains and the Mainland as the base for production operations, must be articulated clearly.

The companies surveyed and interviewed in this study believed that the changing face of manufacturing requires a redefinition of the aims of government in supporting manufacturing in Greater PRD as a whole for Hong Kong and the region's future:

1. The good business environment in Hong Kong should be maintained.
2. There should be greater cooperation in infrastructure development and the setting of rules and regulations.
3. A special public agency for aggregating common concerns and mediating with Mainland authorities should be established.
4. Hong Kong's R&D capabilities should be strengthened.
5. More training and education should be offered to local people, and more talented professionals from the Mainland should be granted visas to work in Hong Kong.
6. The Guangdong business environment should be further improved.
7. Greater efforts should be made to attract more multi-national enterprises to Hong Kong.

Compensatory Trade

Compensatory trade (補償貿易) is an arrangement whereby a foreign company provides a loan (either in the form of money, equipment or technology) to a Mainland enterprise to either set up a factory (or factories) or to explore resources. When the project is completed, the domestic enterprise uses its products or other products to pay back the loan by instalments within an agreed period of time.

Economically Active in the Mainland

Since our study only focuses on manufacturing operations of Hong Kong based companies in the Mainland, a company is said to be economically active in the Mainland if it is engaged in any of the following three activities there: (1) investing in factory facilities in the Mainland; (2) having management and operation control of factory facilities in the Mainland; and (3) making sub-contracting processing arrangements with foreign invested or local enterprises in the Mainland. For the purpose of our study, a company is deemed to be not economically active in the Mainland if it does not pursue any of these three activities, even though it may have other non-manufacturing related business activities in the Mainland.

FFEs (Foreign Funded Enterprises)

FFEs refer to those joint ventures or co-operatives established in the Mainland with foreign investment, as well as establishments wholly funded by foreign capital.

HKM&T Firms

HKM&T firms refer to those Hong Kong registered companies classified as manufacturing firms and import/export firms by the HKSAR Government's Census and Statistics Department in December 2001.

OCFs (Other Contractual Forms)

OCFs refer to three forms of processing and assembly operations, compensatory trade and any other processing arrangements or relationships into which a foreign company enters with a Mainland factory. OCFs include OFIs and OTHs.

OFIs (Other Foreign Investments)

OFIs refer to “three forms of processing and assembly operations and compensatory trade” (三來一補), in which the foreign partner does not have legal ownership of the companies. In China, they are classified as domestic enterprises even though the management of these companies is controlled by their foreign partners.

OTHs (Other Arrangements)

OTHs refer to other arrangements by means of which Hong Kong based companies have share in, control of, or manage domestic enterprises.

Three Forms of Processing and Assembly Operations

Three forms of processing and assembly operations refer to processing with supplied materials (來料加工), assembly with supplied parts (來件裝配) and processing in accordance with supplied samples (來樣加工).

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