香港製造
香港工業啟新章

MADE by HONGKONG

THE WAY FORWARD FOR HK INDUSTRIES

香港工業總會
FHKI Federation of Hong Kong Industries

CONTENTS

Foreword

Since the 1980s, Hong Kong-invested manufacturers have taken the golden opportunity of reform and opening up in the Mainland to set up manufacturing products in the Pearl River Delta region. Taking Hong Kong as business headquarters, this move has formed a cross-border cooperation model of "Front Shop, Back Factory", where the Hong Kong-invested manufacturers rapidly shifted towards the producer services and transformed Hong Kong into a service-oriented economy. In recent years, the business environment in the Mainland has undergone a swift change. Coupled with the global trend in revitalising industries and developing technology-driven advanced manufacturing after the financial crisis of 2008, Hong Kong-invested manufacturers have an urgent need to upgrade and transform to adapt with the changes in the global industrial landscape.

In 2020, the COVID-19 pandemic has severely hit the global economy and trade. Hong Kong-invested manufacturers have also been shrouded in the haze of the China-US trade dispute, pressing them to speed up business transformation. With support from The Trade and Industrial Organisation Support Fund of the Trade and Industry Department, the Federation of Hong Kong Industries ("FHKI") entrusted the Hong Kong Centre for Economic Research of the University of Hong Kong to conduct the research, *Made by Hong Kong: The Way Forward for Hong Kong Industries,* at the FHKI's 60th Anniversary. It is the first time that the economic big data of Hong Kong and China is collated and analysed to help explore the changes and development of Hong Kong-invested manufacturers in the past few years. The study summarised four major coping strategies adopted by Hong Kong-invested manufacturers under various internal and external factors through focus group discussions, in-depth interviews and questionnaire surveys: "China +1", "Business Re-positioning", "Upgrading and Transformation" and "Establishing Production Lines in Hong Kong". Lastly, the report put forward policy recommendations based on the actual challenges faced by manufacturers and expectations on the future development of Hong Kong's industry.

Over the years, Hong Kong-invested manufacturers take Guangdong Province as their main production base, where Hong Kong acts as the coordination centre for upstream and downstream producer services. According to the survey, Hong Kong-invested manufacturers are now more inclined to strengthen technology R&D, product design and develop original brands in transforming their businesses as compared with 2015, adding value to their manufactures through various producer services. Under China's "14th Five-Year Plan", Hong Kong plays the pivotal role of international innovation and technology hub, creating excellent conditions for Hong Kong-invested manufacturers to pursue high value-added, high-technology transformation and for Hong Kong to bolster development of high value-added producer services. With the unique business model of Hong Kong-invested manufacturers, Hong Kong must take bold steps forward in integrating with the Greater Bay Area and ASEAN economies on various fronts in order to strengthen Hong Kong's dominant role as the central hub of regional manufacturing industry.

FHKI hopes that this research report will help the industry, Government and stakeholders to build upon a more holistic view of "industry", covering multiple dimensions of manufacturing activities, from local to abroad, from production to producer services along the value chain, from traditional to emerging manufacturing sectors, from export to domestic sales markets. With these in mind, we anticipate a comprehensive industrial policy to be formulated to promulgate re-industrialisation, develop local advanced manufacturing and producer services, and lead Hong Kong to become the leading manufacturing centre in Asia.

Steve Chuang

Deputy Chairman of the Federation of Hong Kong Industries
Project Convenor of "Made by Hong Kong: The Way Forward for Hong Kong Industries"
July 2021

Throughout six decades, FHKI has been the staunch support and companion for the manufacturing industry and walked through the transition of "Made by Hong Kong" together with countless industrialists. With the COVID-19 outbreak in 2020 and volatile global political and economic condition, the manufacturing industry is reforming in unprecedented pace. Ever since the 2008 financial crisis, major economies sought to strengthen their economic foundation and juggle with the impact of instability in the financial market. The EU, the US and the Mainland all introduced various policies to revitalise industries, especially to develop high value-added, high-tech manufacturing as new drivers for economic growth. The Hong Kong Government also introduced "re-industrialisation" as a policy priority in 2016 to develop advanced manufacturing by adopting new technologies and smart production model. This aims to help local manufacturing to develop into technology-intensive, highly-automated industries in order to drive the demand for technical producer services such as R&D, industrial IoT, testing and certification. It is hoped to inject fresh impetus for developing local economy and employment in Hong Kong.

Since 2002, FHKI has regularly conducted research studies on the operating conditions of Hong Kong-invested manufacturers in the Mainland China, helping the industry and the Government to better understand the development needs of the manufacturing industry. This year marks the beginning of China's "14th Five-Year Plan", as well as the establishment of China's Vision 2035 and dual circulation economic strategy. The *Made by Hong Kong: The Way Forward for Hong Kong Industries* coincides this historical moment of deepening national economic reform to fully review the current development and opportunities of Hong Kong's industry, as well as the progress of local "re-industrialisation", to lay out important references for formulating future industrial policies.

In this research, the analysis of economic big data from the Mainland China and Hong Kong brought specific quantitative references for the unique ecology of Hong Kong's industry for the first time. The profits generated by Hong Kong-invested manufacturers in the Mainland China are equivalent to nearly one-fourth of Hong Kong's GDP in the same year; whereas the producer services in Hong Kong have grown to more than 40% of the GDP now despite the manufacturing industry's northward movement since the 1980s. These results provide empirical evidence for the cooperation model and scale of "Front Shop, Back Factory" of Hong Kong-invested manufacturers. In the past, "Made in Hong Kong" label is a connotation for products manufactured in Hong Kong. However, with the vigorous transformation of the manufacturing sector and the trend of Hong Kong shifting towards producer services, "Made by Hong Kong" would be a better term to represent the diverse products that are researched, developed, designed and produced by Hong Kong-invested manufacturers with the intellectual and quality excellence originated from Hong Kong.

There is a pressing need for our Government to formally look into the long-term industrial development in Hong Kong, with due consideration to develop core technologies and nurture industrial talents through re-industrialisation of selected industries for the sustained growth of "Made by Hong Kong". It is now the best of time for the Hong Kong industry as a whole to propel to a higher level by taking advantage of the Asian economic take-off and manufacturing transformation opportunities. FHKI hopes that this research report can provide the necessary data to back up the Hong Kong Government in devising a comprehensive industrial development blueprint and bring Hong Kong into a new industrial era.

Dr Daniel Yip

Chairman of the Federation of Hong Kong Industries
July 2021

Chapter 1
Preface

Hong Kong-invested manufacturers have established strong presence in the Pearl River Delta since the 80s and 90s. With the Hong Kong office as the operating headquarters, enterprises adopted the "Front Shop, Back Factory" cooperation model. Thanks to the low operating cost in Pearl River Delta, the business focus of Hong Kong offices has gradually shifted to producer services, leading to a smooth transition of Hong Kong's economy towards the service industry. At the same time, the Pearl River Delta has been able to establish a comprehensive manufacturing industrialisation system with the huge investment from Hong Kong-invested manufacturers, enabling the Mainland to become the world's most influential exporter and earning the reputation of "the world's factory".

However, with the rapid economic growth of the Mainland, there has been a change in national policies, regulatory approach and market demand since 2000. This created different business challenges to the operation of Hong Kong-invested manufacturers in Pearl River Delta. Fortunately, the new national economic strategy also brought in new business opportunities for these manufacturers. After the financial crisis in 2008, major economies have implemented industrial revitalisation plans and promoted industrial development towards technology-based and high value-added production. In particular, developed economies have begun to adjust industrial policies to strengthen domestic manufacturing industries, thereby laying solid foundation for the stability and sustainability of the overall economy.

With the funding of the Trade and Industrial Organisation Support Fund ("TSF") under the Trade and Industry Department, the Federation of Hong Kong Industries ("FHKI") commissioned the Hong Kong Centre for Economic Research of the University of Hong Kong (the "Research Team") to conduct the *Made by Hong Kong: The Way Forward for Hong Kong Industries* Research.

The purpose of this research, in the context of the economic and political developments in Hong Kong, the Mainland, and internationally, and of the evolutions in the business environment, is to understand the coping strategies of Hong Kong-invested manufacturers and explore the development outlook of Hong Kong's industry for putting forward policy proposals for Hong Kong's re-industrialisation and future industrial development.

1.1 Research Background and Purpose

1.1.1 Understanding the landscape of Hong Kong's industrial development

From the perspective of the industrial layout of the Greater Bay Area ("GBA"), most Hong Kong-invested manufacturers played a pivotal role between Mainland production bases and multinational enterprises during the Pearl River Delta Manufacturing era (1980-2000). The Hong Kong-invested manufacturers located in the Pearl River Delta primarily engage in outsourcing processing trade led by multinational enterprises with the focus of original equipment manufacturer ("OEM") and original design manufacturer ("ODM") businesses. Multinational enterprises control the global Industrial chain and production chain through upstream R&D, product design, technological monopoly, and downstream brand building and sales network whereas Hong Kong-invested manufacturers are relatively passive.

In terms of the business environment, the Mainland has strengthened regulatory control over import, export, and bonded warehouse management after becoming a member of the World Trade Organisation ("WTO") in 2001. Since then, more and more foreign enterprises have set up factories in the Mainland. With the booming development of IT and electronics manufacturers from Taiwan, the increasing number of Japanese-funded automobile manufacturers in Guangzhou and the dominant position of China-funded enterprises in the manufacture of communication equipment and home appliances, Hong Kong-invested manufacturers faced tremendous challenges to stay competitive in the region. In addition, the rapidly-growing container terminal businesses in the Pearl River Delta has weakened the role of cargo transit of Hong Kong.

In 2006, the national 11th Five-Year Plan led to a series of policy refinements in industry development, trade, labour and finance in the Mainland. New policies such as the reform of RMB exchange rate, Labour Contract Law and imputation tax system have significantly increased the operating costs of Hong Kong-invested manufacturers. Since the labour-intensive, low-tech, and high-energy-consuming manufacturing model places huge pressure on the human resources, energy consumption and pollution in Guangdong Province, the provincial government implemented the "emptying the cage, changing the birds" industrial restructuring measure in 2013. The most stringent Environmental Protection Law implemented in 2015 also authorises the law enforcement agencies to exercise higher penalties. Such policy changes have driven HK-funded businesses in Guangdong Province to relocate their production lines to inner provinces with abundant human resources and lower labour cost. Some manufacturers even decided to relocate their factories to Southeast Asian countries.

After the global financial crisis in 2008, the global economic downturn has led Hong Kong-invested manufacturers who used to rely on export orders from multinational enterprises need to reposition their business strategies for survival. In addition to consolidating the pivotal role on the production chain, many Hong Kong-invested manufacturers took initiative to extend to the upstream and downstream of the industrial chain. They strengthened the investment in R&D, developed brands and built up market positions to become a more dominant player in the production chain.

China-US relations have been strained ten years after the 2008 global financial crisis. Both countries have significantly increased the tariff on each other's imported goods. The average tariff on goods imported from the Mainland to U.S. rose from 3.1% when Trump assumed presidency in early 2017 to 21% at the end of 2019. The average tariff on goods imported from the U.S. to the Mainland has risen from 8.0% in April 2018 to 20.9% in September 2019. The Mainland's exports to the U.S. have declined sharply with a year-on-year decrease of 12.5%[1] in 2019, posing huge stress to Hong Kong-invested manufacturers that focus on the European and American markets.

1 Deloitte China, "Imperative: Taking Advantage of the One-Phase Ceasefire Opportunity" https://www2.deloitte.com/cn/zh/pages/about-deloitte/articles/impact-of-china-us-trade-war-on-related-industries.html#

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Hong Kong-invested manufacturers are facing multiple changes in the operating environment. Externally, there is a shift of global economy's centre of gravity to the east, China-US trade disputes and the signing of Regional Comprehensive Economic Partnership ("RCEP"). Internally, the domestic business environment continues to evolve. Coupled with the new business normal derived from the COVID-19 pandemic, Hong Kong-invested manufacturers must adjust their supply chain and business strategies to sustain growth.

1.1.2 Positioning for Hong Kong's re-industrialisation

Since the northward movement of production line in the 1980s, the offshore manufacturing activities and output value of Hong Kong-invested manufacturers and their economic impact on local producer services have long been underestimated. Another purpose of this study is to explore the scope of manufacturing in a more comprehensive way by examining the direct and indirect contribution to the local economy, and to outline the directions of future industrial development in Hong Kong.

1.2 Methods of Research

The research team conducted big data analysis, questionnaire surveys, in-depth interviews, focus group discussions and literature reviews to understand the current operating conditions and strategies adopted by Hong Kong-invested manufacturers, including the implementation of the "China+1" strategy, the progress of upgrading and transformation, and the expansion of domestic sales and ASEAN market.

1.2.1 Database analysis

The report analysed the development of Hong Kong-invested manufacturers from various aspects using the data from the following databases:

- The list of all Hong Kong-invested enterprises from the Companies Registry[2] was extracted to identify the Hong Kong-invested enterprises and their subsidiaries in the Mainland as the research sample of this report;

- Use the China Industrial and Commercial Registration Database[3] to analyse the enterprises' share composition, foreign investment composition, industry and distribution. Identify Hong Kong-invested manufacturers (Hong Kong, Macao and Taiwan enterprises with over 33.3% investment from Hong Kong, and are registered as foreign investment, Sino-foreign joint cooperation and Sino-foreign joint ventures), and other foreign-funded manufacturing companies;

2 Covering data from 1865 to 2016.
3 Covering data from 1970 to 2016.

- Study the information of the database of "Industrial Enterprises above Designated Size" from the National Bureau of Statistics of China[4] to understand the current conditions of manufacturing companies operating in the Mainland (such as profits, assets, number of employees, etc.);

- Based on the data from the China Customs Enterprise Import and Export Database[5] to understand the export capacities of manufacturing companies operating in the Mainland;

- Use the patent database of China National Intellectual Property Administration[6] to understand the numbers of authorised patents obtained by enterprises, in order to compare the innovation and R&D capacities of Hong Kong-invested manufacturers and other foreign-funded manufacturing companies; and

- Use the foreign trade statistics provided by the Ministry of Commerce of the People's Republic of China to obtain the latest trade figures of Hong Kong, Macao, Taiwan and other foreign-funded manufacturing companies operating in the Mainland[7].

1.2.2 Questionnaire survey and focus group discussion

The questionnaire survey was conducted in the fourth quarter of 2020, and a total of 231 valid questionnaires were received. The focus group discussions were held four times during the same period. By exchanging views with the industry, the research team better understood of business concerns and business strategies. In addition, the team conducted in-depth interviews with a number of traditional and emerging businesses. The research team summarised the characteristics of Hong Kong-invested manufacturers after analysing the information and data from the research. The report also provided policy recommendations for the future direction of industrial development in Hong Kong.

Through this research, FHKI hopes to understand the changing industrial operation and future development trends in order to derive recommendations for Hong Kong industry to adjust business strategies. At the same time, it also provides important references for the Hong Kong Government to formulate industrial policy and future economic development strategies.

4 The National Bureau of Statistics of China (NBS) defines "industrial enterprises above designated size" as manufacturing enterprises with main business income of RMB 20 million or more and fixed asset investment of RMB 5 million. This database covers detailed business operating data, such as profits, assets, number of employees, etc. and the data for academic purposes is updated to 2013.

5 China Customs Enterprise Import and Export Database covers monthly export transaction data of Chinese export enterprises from 2000 to 2016, including product type (8-digit HS Code for Chinese Import and Export Goods), export volume, export value, exporter's identity and export destination, etc.

6 Covering data from 1985 to 2018.

7 Covering data from 2013 to 2019.

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In the 1980s and 1990s, many Hong Kong-invested manufacturers migrated their production lines to the Mainland, and moved the "Made in Hong Kong" to Pearl River Delta in the form of "Front Shop, Back Factory". Benefited from the abundant labour supply, abundant land resources and low operating cost in the Mainland, the production scale has expanded rapidly. As the headquarter for production coordination, marketing, financing, logistics and R&D activities, Hong Kong's local producer services proliferated, leading to Hong Kong's transition towards a service-based economy.

In general, Hong Kong's economic statistics only reflect business activities in Hong Kong, whereas the business, output value and industry profile of Hong Kong-invested enterprises offshore are not featured in regular surveys. However, with the "Front Shop, Back Factory" operation model, the industry profile of Hong Kong-invested manufacturers operating in the Mainland is a very important reference for Hong Kong's industrial development and policy formulation. In particular, the scale of offshore production activities of Hong Kong-invested manufacturers, their export and domestic market orientation, industry distribution and their investment preferences in overseas markets, especially in Southeast Asia in recent years, are essentials to help Hong Kong formulate long-term industrial policies. Through big data analysis **(refer to section 1.2 for detailed research methods)**, this study analyses business information of Hong Kong-invested manufacturers from economic data of other regions to help understand their operating conditions and support Hong Kong in formulating appropriate policies for the sustainable growth of Hong Kong-invested manufacturers operating in other regions and thereby, drives the demand of local producer services.

2.1 Overall situation of Hong Kong-invested manufacturers in the Mainland

2.1.1 Number of Hong Kong-invested manufacturers in the Mainland

Through big data analysis[8], there were about 46,000 Hong Kong-invested manufacturers in the Mainland in 2016, of which about 32,000[9] were engaged in exports.

2.1.2 Total output value of Hong Kong-invested manufacturers in the Mainland[10]

According to the statistics[11], in 2019, Hong Kong-invested manufacturers had about RMB 8.5 trillion assets in the Mainland, and their total profit is about RMB 609.3 billion, which is equivalent to approximately HK$680.1 billion[12], or 23.7% of Hong Kong's GDP (HK$2.87 trillion)

8 The research team obtained a list of all Hong Kong-funded enterprises in the Companies Registry. According to this list, Hong Kong-funded enterprises and their subsidiaries in the Mainland are identified as the research sample of this report. In addition, the China Industrial and Commercial Registration Database is used to analyse the company's share composition, foreign investment composition, industry and distribution and other information to identify Hong Kong-invested manufacturers (Hong Kong, Macao and Taiwan enterprises with over 33.3% investment from Hong Kong, and are registered as foreign investment, Sino-foreign joint cooperation and Sino-foreign joint ventures).

9 The latest data that can be obtained from the Companies Registry and the Chinese customs enterprise import and export database are information back in 2016, thus the research team uses this data as the main research sample.

10 The total output value of Hong Kong-invested manufacturers in Mainland is estimated using the income calculation method with the total profit as reference.

11 The total assets of Hong Kong, Macao, and Taiwan-funded enterprises in 2019 were RMB 9.5 trillion, among which Hong Kong-funded industrial enterprises had assets of about RMB 8.5 trillion, accounting for 7.1% of the total assets of industrial enterprises nation-wide (RMB 120.5 trillion). The total profit of Hong Kong, Macao, and Taiwan-funded enterprises is RMB 677.1 billion, among which the total profit of Hong Kong-funded industrial enterprises is about RMB 609.3 billion, accounting for 9.3% of the total profit of industrial enterprises nation-wide (RMB 6.5 trillion).

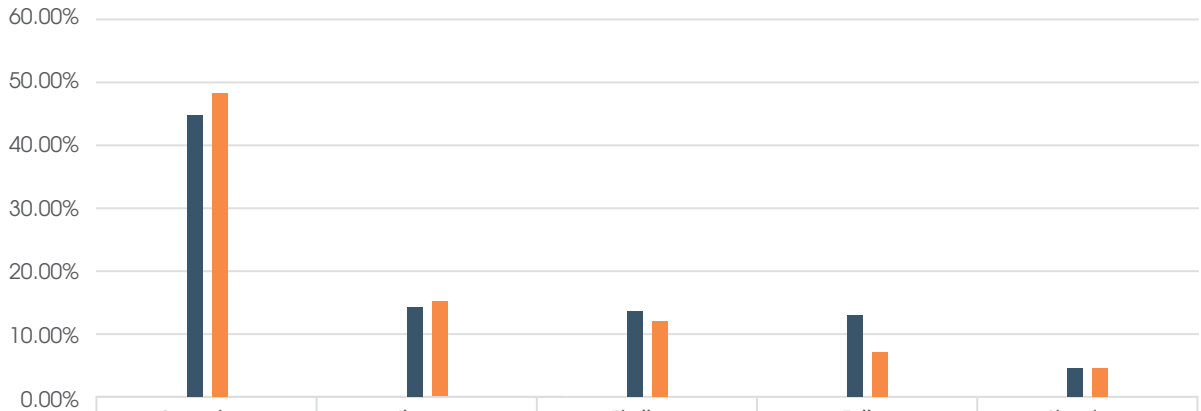
12 Calculated based on the CNY central parity rate (HK$1 to RMB 0.89578) announced by the State Administration of Foreign Exchange on 31st December 2019.

that year. The economic impact of Hong Kong-invested manufacturers offshore cannot be underestimated, and it has been a substantial driving force for the demand of producer services in Hong Kong.

2.1.3 Regional distribution of Hong Kong-invested manufacturers

In terms of regional distribution, more than 48.5% of Hong Kong-invested manufacturers are located in Guangdong Province. The proportion of Hong Kong-invested manufacturers in Guangdong to the total in the Mainland has increased in recent years. Secondly, an average of 26.9% Hong Kong-invested manufacturers have chosen to develop in the Yangtze River Delta, particularly the Jiangsu Province, forming the dual production centre pattern of Pearl River Delta and Yangtze River Delta. Some Hong Kong-invested manufacturers choose to settle in Fujian Province (7.7%), Shandong Province (4.2%), Jiangxi, Hubei, Anhui and other provinces. **(Figure 2-1)**

Figure 2-1 Regional Distribution of Hong Kong-invested manufacturers



	Guangdong	Jiangsu	Zhejiang	Fujian	Shandong
2000s	45.40%	14.20%	13.90%	12.40%	4.20%
2010s	48.50%	15.10%	11.80%	7.70%	4.20%

Source: China Industrial and Commercial Registration Database (2016)

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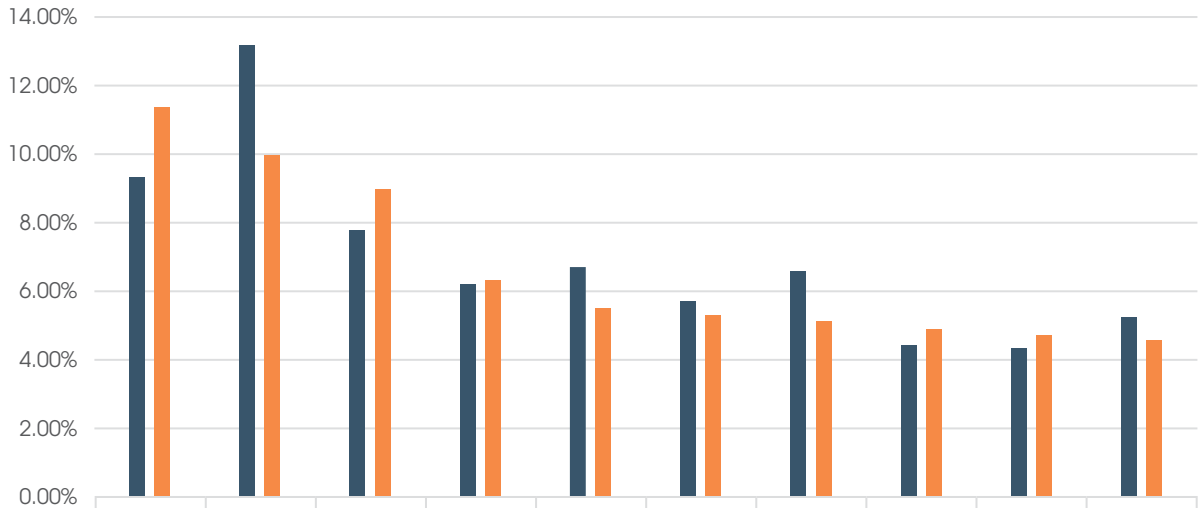
2.1.4 Industrial distribution

According to 2016 data, Hong Kong-invested manufacturers in the Mainland mainly engage in the manufacturing of telecommunication equipment, computers and other electronic equipment (11.6%), textile[13] (10.0%), followed closely by electric machinery and equipment[14] (8.9%). Among other industries, the industries whose proportions have increased between 2004 and 2016 are plastic products, metal products, and smelting and processing of non-ferrous metals industries. On the other hand, the industries whose proportions have decreased include cultural, educational and sporting goods manufacturing, and raw chemical materials and chemical products manufacturing, which accounted for 4% to 6.5%. **(Figure 2-2)**

Figure 2-2 Industrial Distribution of Hong Kong-invested manufacturers[15]



	Telecom-munication equipment computers and other electronic equipment	Textile	Electric machinery and equipment	Plastic products	Leather, fur, down and related products	Cultural, educational and sport-ing goods	Textile, apparel, footwear and caps	Metal products	Smelting and processing of non-ferrous metals	Raw chemical materials and chemi-cal products
2000s	9.30%	13.20%	7.90%	6.10%	6.40%	5.80%	6.30%	4.30%	4.20%	5.40%
2010s	11.60%	10.00%	8.90%	6.20%	5.60%	5.50%	5.10%	4.70%	4.60%	4.40%

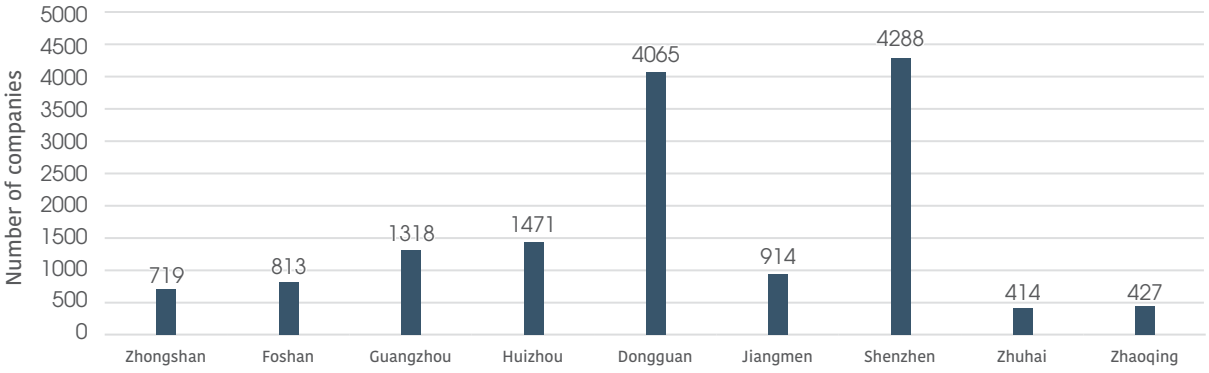
Source: China Industrial and Commercial Registration Database (2004, 2016)

13 This report summarises the "textile", "leather, fur, down and related products" and "textile, apparel, footwear and caps" sectors together as the textile industry.
14 Electric machinery and equipment manufacturing is a major industry in industrial classification for national economic activities GB/T4754-2011. Among them, there are four sub-industries belonging to the machinery industry, namely: motor manufacturing (3810), transmission, distribution and control equipment manufacturing (3820), wire, cable, optical cable and electrical equipment manufacturing (3830), and battery manufacturing (3840).
15 The 2000s and 2010s are the calculation results of the 2004 and 2016 sample data respectively.

2.1.5 Regional distribution of Hong Kong-invested manufacturers in the Greater Bay Area

Due to geographical proximity, Hong Kong-invested manufacturers cluster in the Guangdong Province, where the Greater Bay Area is the key developmental area with its closest connection to Hong Kong. In 2016, among more than 22,000 Hong Kong-invested manufacturers operating in Guangdong Province, 14,429 were located in nine GBA cities, mainly in Shenzhen (4,288, 30%), Dongguan (4,065, 28%), Huizhou (1,471, 10%) and Guangzhou (1,318, 9%). Shenzhen and Dongguan have become the two cities with the largest distribution of Hong Kong-invested manufacturers due to their proximity to Hong Kong and low labour cost respectively. **(Figure 2-3)**

Figure 2-3 Number of Hong Kong-invested manufacturers in the Greater Bay Area



Source: China Industrial and Commercial Registration Database (2016)

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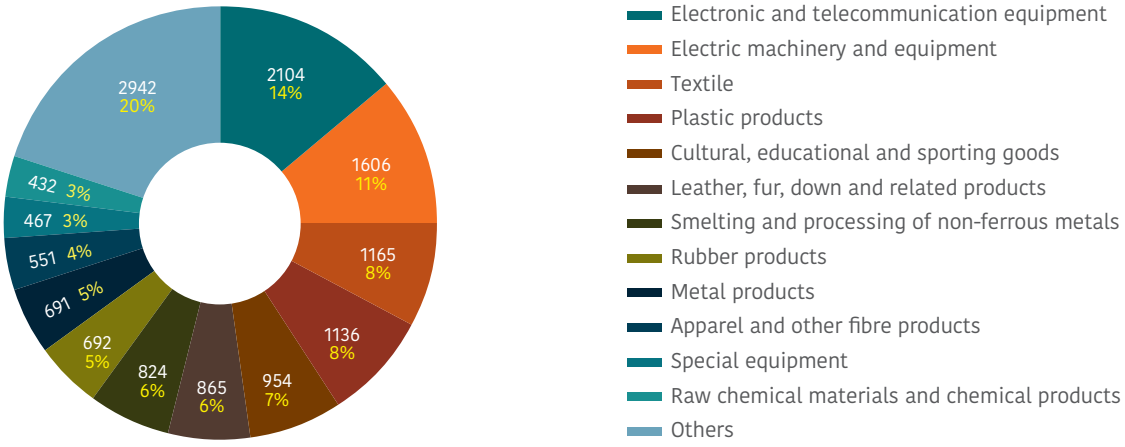
2.1.6 Industrial distribution of Hong Kong-invested manufacturers in the Greater Bay Area

The electronic and telecommunication equipment manufacturing industries are mainly concentrated in Shenzhen and Dongguan. Guangzhou, Dongguan, Huizhou, Zhuhai, and Jiangmen are mainly dominated by electric machinery and equipment manufacturers, while Foshan and Zhongshan are primarily dominated by apparel and other fibre product manufacturers. **(Figure 2-4)**

Figure 2-4 Industrial distribution of Hong Kong-invested manufacturers in the Greater Bay Area



Source: China Industrial and Commercial Registration Database (2016)

2.1.7 Features of Hong Kong-invested manufacturers in the Yangtze River Delta Region

In terms of patent distribution, Hong Kong-invested manufacturers operating in the Yangtze River Delta in the Mainland production chain are becoming more prominent. Since 2000, the proportion of Hong Kong-invested manufacturers' patents obtained in Guangdong Province has declined, while the proportion of patents obtained in the Yangtze River Delta has nearly doubled. In 2000, 26.6% of the patents of Hong Kong-invested manufacturers were registered in Guangdong Province, while 8.8% were registered in the Yangtze River Delta. By 2018, 22.6% of the patents of Hong Kong-invested manufacturers were registered in Guangdong Province, while 17.2% were registered in the Yangtze River Delta. It can be seen that Hong Kong-invested manufacturers have increased their R&D and product design activities and patents application in the Yangtze River Delta, particularly in Jiangsu Province and Zhejiang Province. The Yangtze River Delta houses nearly a quarter of China's double-first-class universities and many State Key Labouratories and National Engineering Research Centers, and accounts for nearly one-third of the national annual R&D expenditure and effective patent applications, making it the region with the most scientific education resources and research funds in China.

In 2016, the Yangtze River Delta Integration Plan released by the National Development and Reform Commission positioned the Yangtze River Delta as a modern service and advanced manufacturing centre. The pillar industries of different provinces complement each other to form a comprehensive regional industrial chain. Among them, Shanghai serves as an international economic, financial, trade and shipping centre. Jiangsu, where many Hong Kong-invested manufacturers are located, serves as an advanced manufacturing centre with focus in electronic information and biotechnology; Zhejiang Province focuses on consolidating traditional pillar industries, such as the textile industry, and promoting the emerging new material industries. Hong Kong-invested manufacturers make use of the Yangtze River Delta's policy dividends to strengthen their industrial positions, and as a result, they increased investment in the Yangtze River Delta to set-up production bases and carry out R&D activities.

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2.1.8 Status of newly established foreign-funded manufacturers in the Mainland (2013 – 2019)

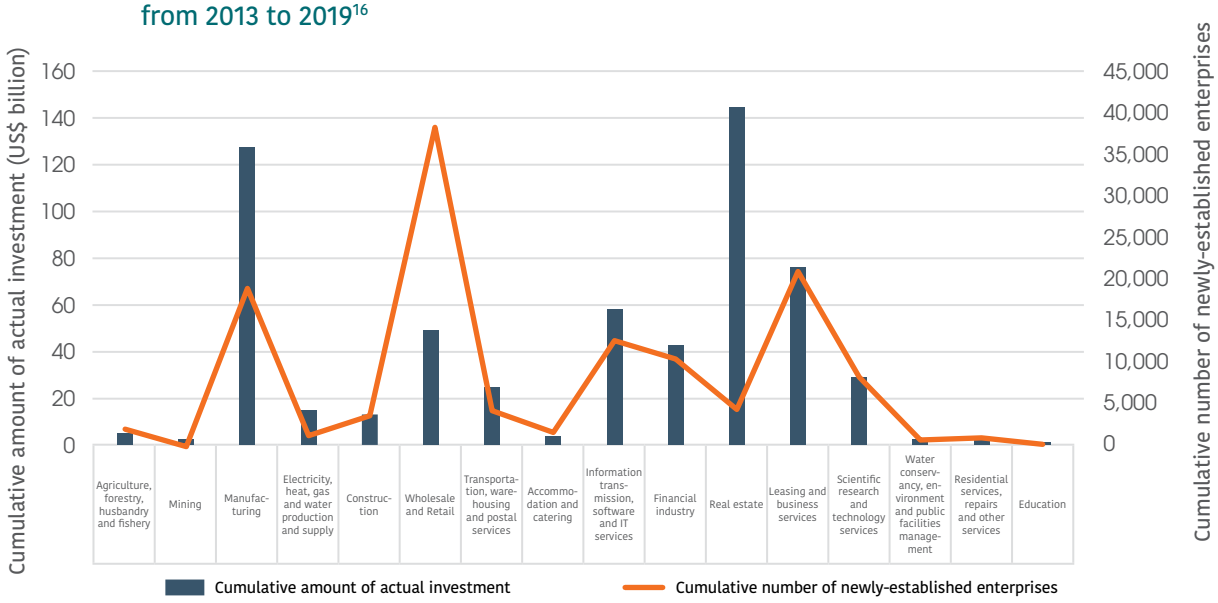
According to national statistical analysis, the cumulative number of newly-established enterprises, actual investment amount, and average enterprise investment amount of Hong Kong-invested manufacturers are much higher than that of the Taiwan and Macao-funded businesses. **(Table 2-1, Figure 2-5, Figure 2-6)**

Table 2-1 Comparison of Hong Kong, Macao, Taiwan and other foreign-funded newly established manufacturing companies in the Mainland from 2013 to 2019

	Hong Kong	Taiwan	Macao	Other foreign-funded businesses
Cumulative number of newly-established manufacturing enterprise (% in all foreign-funded manufacturing enterprises)	18,035(49.1%)	4,001(10.9%)	558(1.5%)	14,142(38.5%)
Actual investment amount (% in all foreign-funded manufacturing enterprises)	US$128.3 billion(47.4%)	US$7.84 billion(2.9%)	US$1.05 billion(0.4%)	US$133.37 billion(49.3%)
Average enterprise investment amount	US$7.114 million	US$1.96 million	US$1.882 million	US$9.43 million

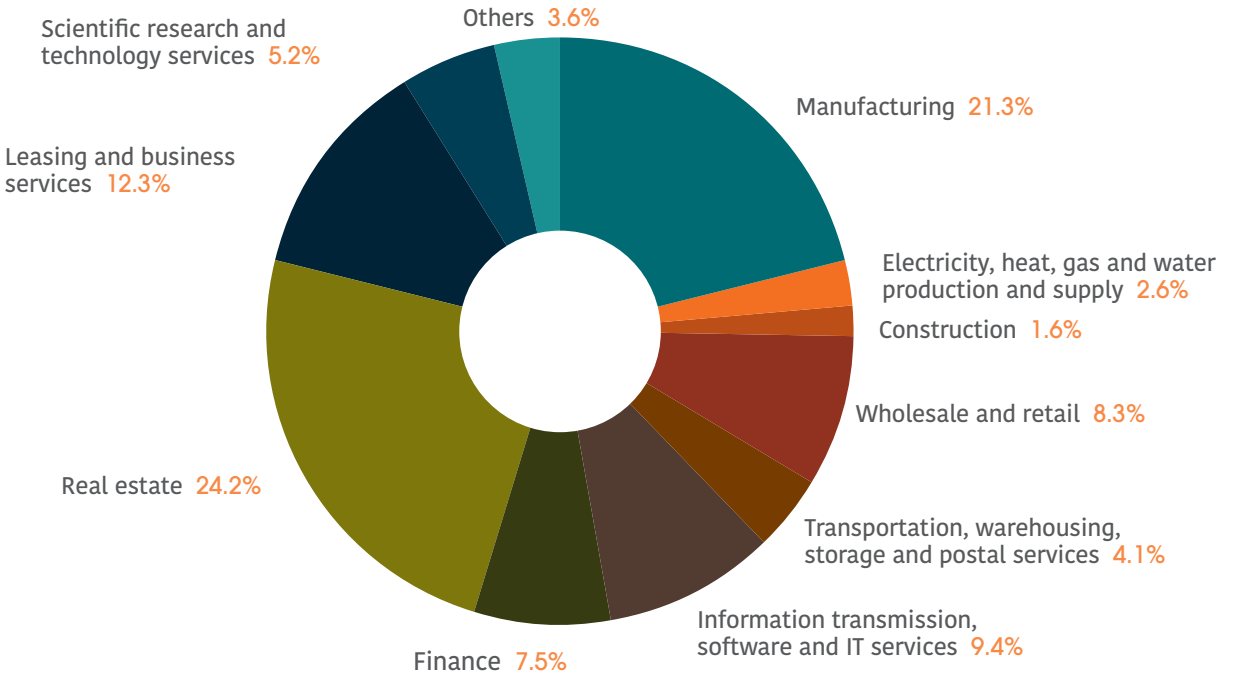
Source: Foreign Investment Statistics, Ministry of Commerce of the People's Republic of China

Figure 2-5 Specific Industry of Hong Kong-invested enterprises in the Mainland from 2013 to 2019[16]



Source: Foreign Investment Statistics, Ministry of Commerce of the People's Republic of China

Figure 2-6 Industry Distribution of Newly-established Hong Kong-invested enterprises in the Mainland From 2013 to 2019



Source: Foreign Investment Statistics, Ministry of Commerce of the People's Republic of China

16 Figure 2-5 and Figure 2-6 represents the cumulative investment amount of newly established enterprises from 2013 to 2019.

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2.1.9 Entry and Exit of Hong Kong-invested manufacturers in the Mainland

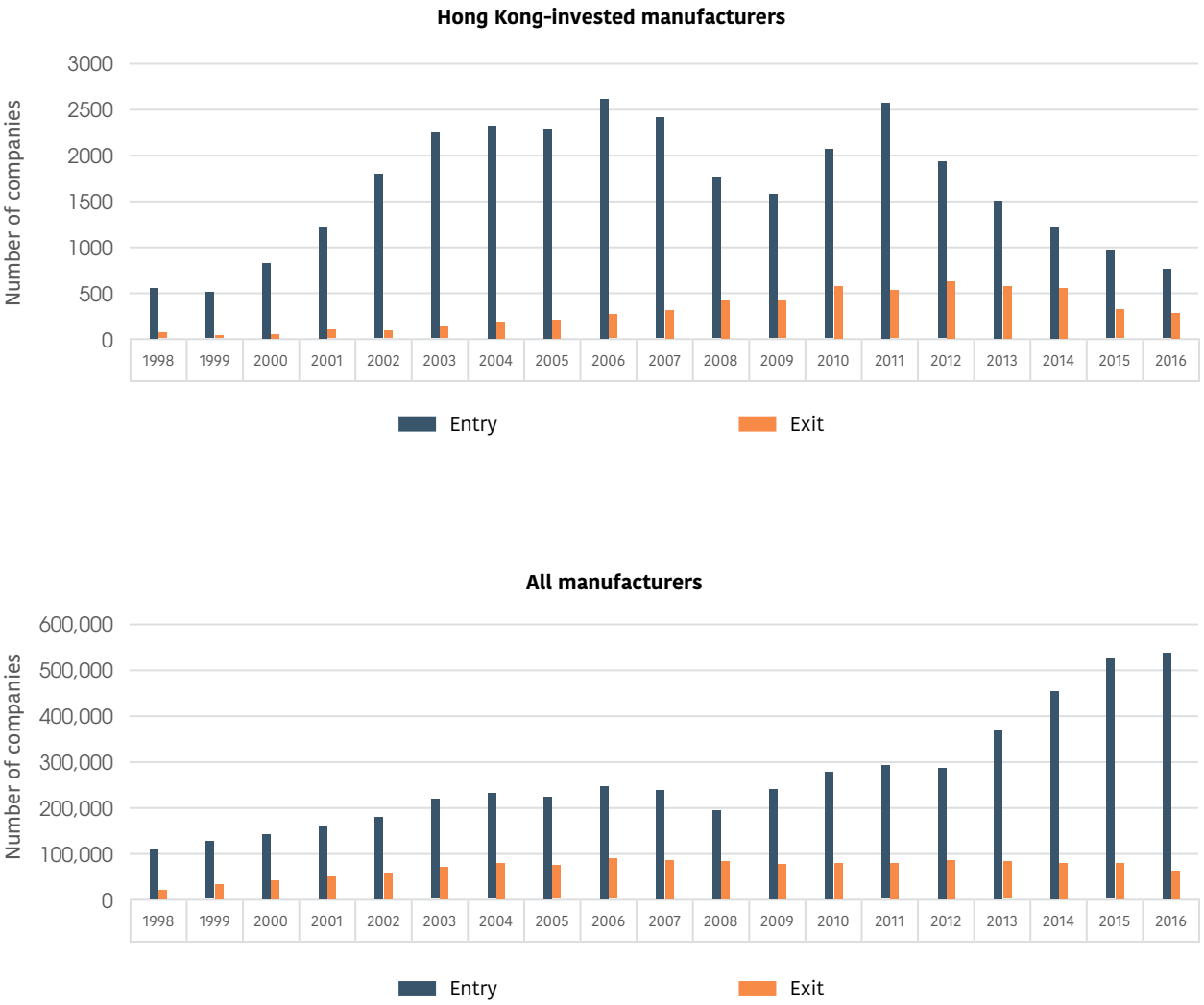
As China became a WTO member in 2001 and the Mainland and Hong Kong entered into the "Closer Economic Partnership Arrangement" ("CEPA") in 2003, Hong Kong-invested manufacturers had been expanding their footprint to the Mainland market, from about 900 manufacturers in 2000 to 2,500 manufacturers in 2007. The number of exiting companies remained at a low level[17] . **(Figure 2-7)**

However, the developmental scale of the Hong Kong industry in the Mainland has been shrinking in recent years, especially after the financial crisis in 2008. Ever since 2011, the number of Hong Kong-invested manufacturers entering the Mainland has dropped from a high level of more than 2,500 to less than 800 in 2016. In 2016, the entry-exit ratio was 7:2, which was higher than the average entry-exit ratio of all foreign-funded enterprises in the Mainland, reflecting that Hong Kong-invested manufacturers have made adjustments due to the changing operating environment in the Mainland. They either relocated their production lines, moved out of the Mainland, moved back to Hong Kong, or even terminated the business.

According to *Made in PRD 2015 Study – Hong Kong Industries: The Way Forward*, the Hong Kong-invested manufacturers are mainly SMEs, and 55.3% of manufacturers have revenue of less than HK$50 million. According to the latest survey, the percentage of Hong Kong-invested manufacturers with annual sales of less than HK$50 million fell to 36%. It reflected that Hong Kong-invested manufacturers with a business scale of more than HK$50 million are still competitive in the Mainland. Those who withdraw from the Mainland are mainly SMEs, which may require more policy support.

17 During 2007 to 2011, the number of Hong Kong-invested manufacturers entering the Mainland displayed a V-shaped recovery trend. The fall is mainly due to the financial tsunami and economic recession in 2009. The Central Government decided to implement the RMB 4 trillion economic stimulus programme to increase domestic demand and promote steady economic growth, which lead to the increase in number of Hong Kong-invested manufacturers entering the Mainland market between 2010 and 2011.

Figure 2-7 Comparison of annual entry and exit of Hong Kong-invested manufacturers and all manufacturers in the Mainland



Source: China Industrial and Commercial Registration Database

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2.2 The export conditions of Hong Kong-invested manufacturers in the Mainland

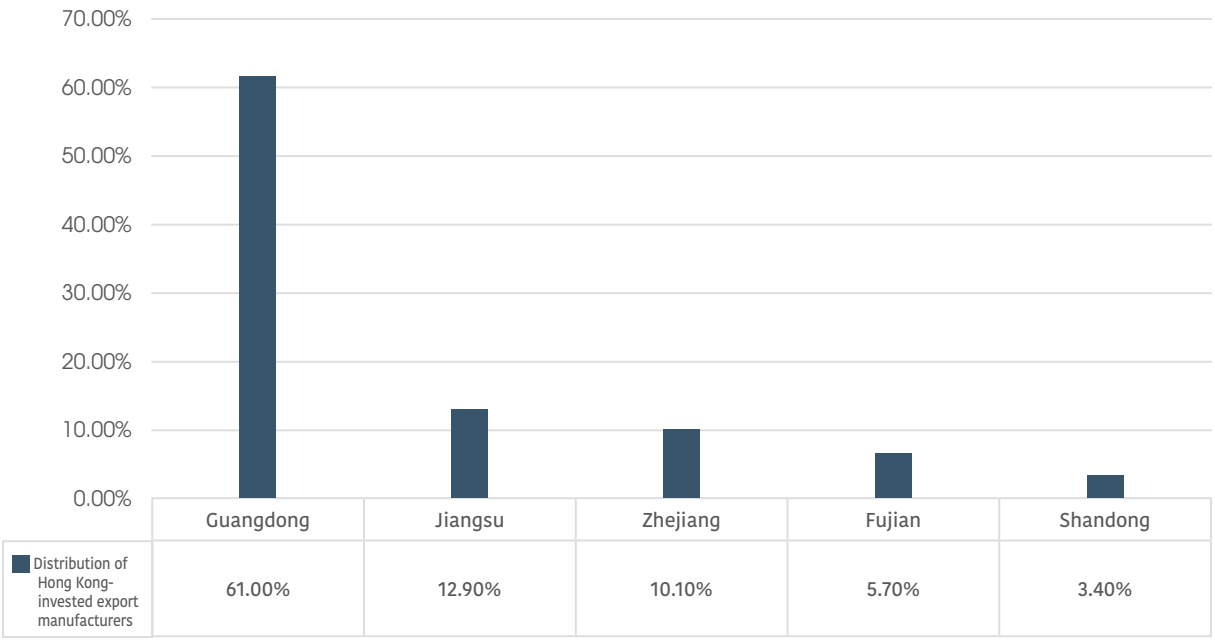
2.2.1 Regional distribution of Hong Kong-invested export manufacturers

In terms of the regional distribution of export enterprises, over 60% of Hong Kong-invested export manufacturers are located in Guangdong Province. There is no significant decrease in such numbers over time. Secondly, 24.4% of Hong Kong-invested export manufacturers operate in the Yangtze River Delta, which shows the dual production centre pattern of Hong Kong-invested manufacturers. **(Figure 2-8)**

2.2.2 Percentage of Hong Kong-invested manufacturers' exports in the Greater Bay Area

There are 5,709 Hong Kong-invested export manufacturers in the Greater Bay Area, accounting for 37.1% of the total number of Hong Kong-invested export enterprises in the region; and accounting for 22.9% of the total number of export manufacturers in the region, with Shenzhen and Dongguan being the main export production bases. The export value of Hong Kong-invested manufacturers in the GBA reached US$77.2 billion, which is about 39.7% of the total export value of Hong Kong-invested manufacturers in the Mainland. Hong Kong-invested manufacturers contributes more than one-third (34.1%) of the total export of manufacturing industry in the GBA, which proves that Hong Kong-invested manufacturers play an important role in the export trade and export-oriented industries of the GBA. **(Figure 2-9)**

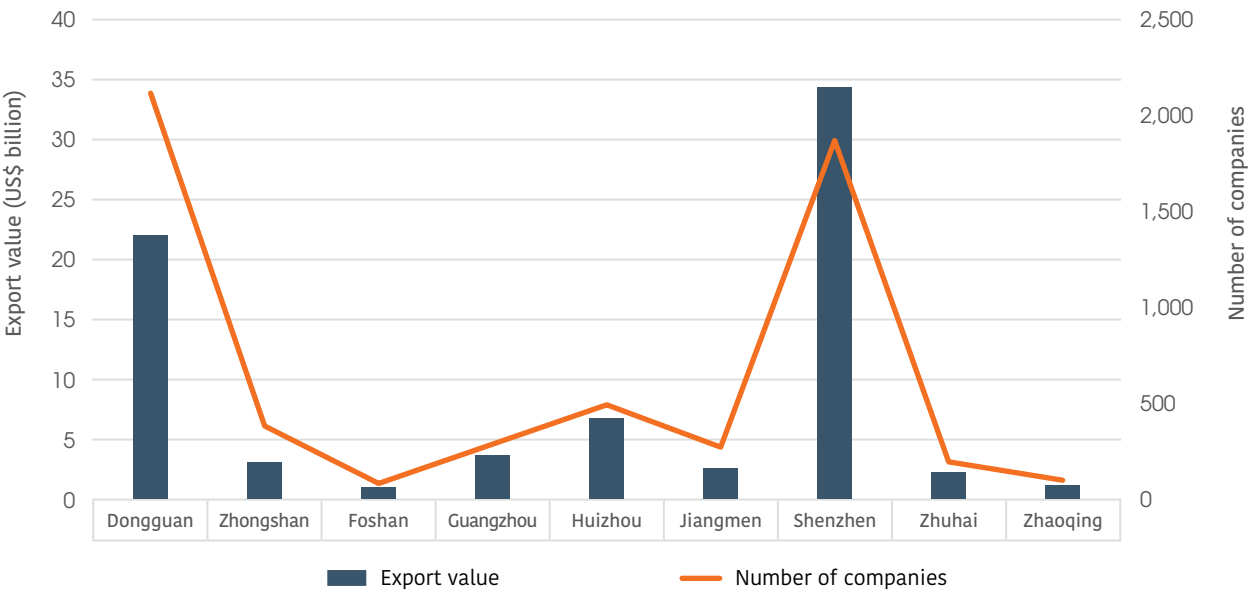
Figure 2-8 Top five provinces where Hong Kong-invested export manufacturers are distributed



	Guangdong	Jiangsu	Zhejiang	Fujian	Shandong
Distribution of Hong Kong-invested export manufacturers	61.00%	12.90%	10.10%	5.70%	3.40%

Source: China Industrial and Commercial Registration Database and China Customs Enterprise Import and Export Database (2016)

Figure 2-9 Export distribution of Hong Kong-invested manufacturers in the Greater Bay Area



Source: China Industrial and Commercial Registration Database and China Customs Enterprise Import and Export Database (2016)

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2.2.3 Percentage of Hong Kong-invested manufacturers' exports in the Mainland

Figure 2-10 and **Figure 2-11** indicated that from 2000 to 2016, Hong Kong-invested manufacturers, which accounted for less than 10% of total number of manufacturers, contributed nearly 20% of the total manufacturing exports of the Mainland. Taking 2016 as an example, there were about 15,000 Hong Kong-invested export manufacturers, accounting for 4.6% of all export manufacturers in the Mainland; export value was US$194.6 billion, accounting for 19.0% of the total manufacturing exports in the Mainland.

Figure 2-10 Number and proportion of various export manufacturers

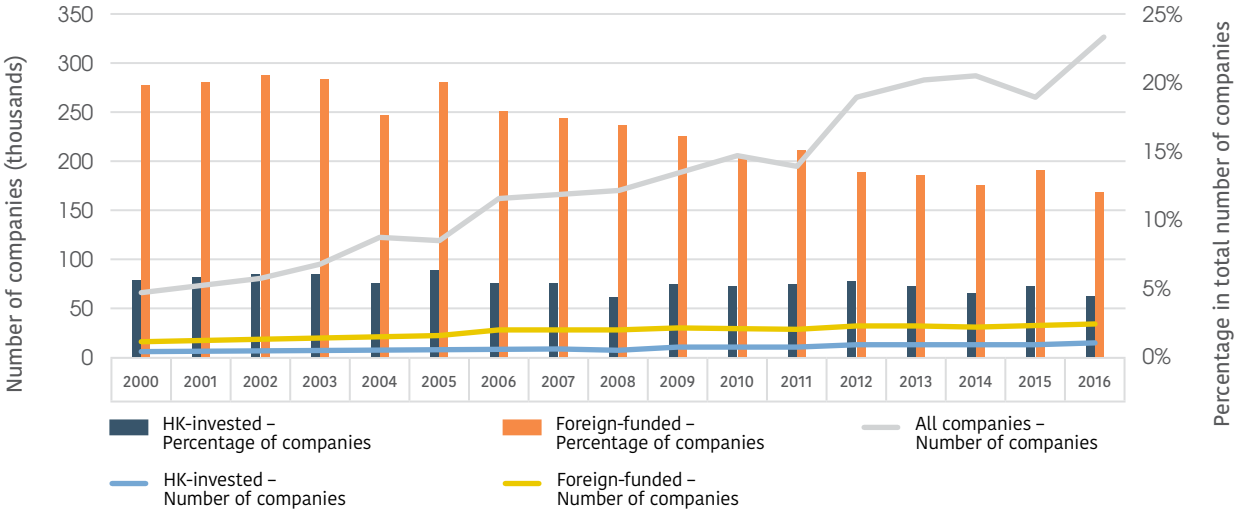
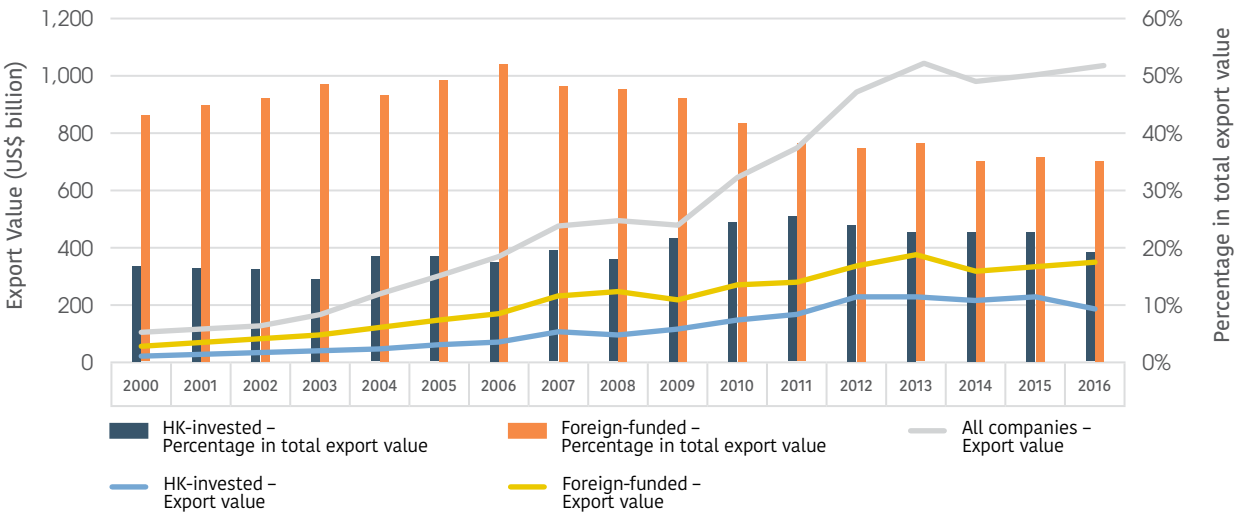


Figure 2-11 Export value and proportion of various manufacturing enterprise



Source: China Industrial and Commercial Registration Database and China Customs Enterprise Import and Export Database

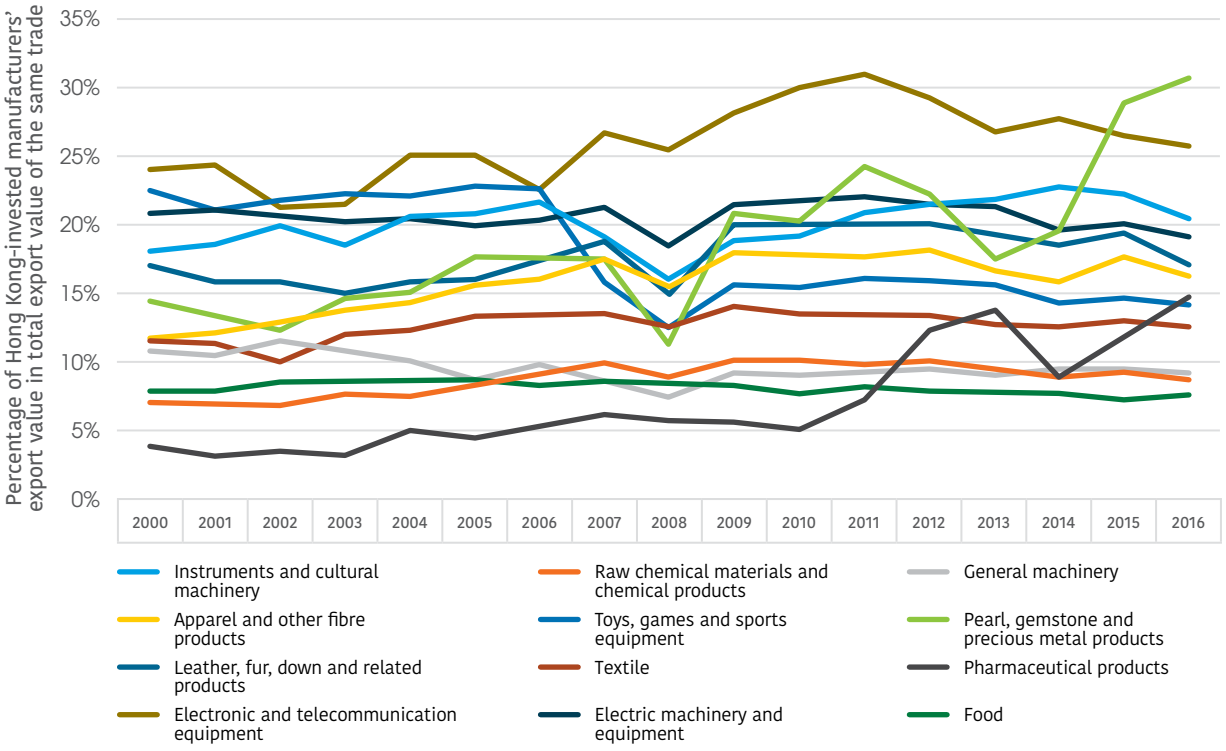
2.2.4 Trade status of Hong Kong-invested manufacturers of different industries in the Mainland

Among the ten industries with larger scale or better development prospects for Hong Kong-invested manufacturers[18], Hong Kong-invested manufacturers' total exports in the electronic and telecommunication equipment manufacturing industry accounted for more than 25% of the total exports. By 2011, the figure even reached as high as 31.1%.

The amount of exports of Hong Kong-invested manufacturers in pearl, gemstone and precious metal products industries rose sharply after 2008, and in 2016 this accounted for 30.1% of the total exports. For the instruments and cultural machinery industry and the electric machinery and equipment industry, Hong Kong-invested manufacturers account for about 20% of the total exports of the respective industry.

In the textile industry, although the export value from Hong Kong-invested enterprises is comparatively higher, their industry status has no obvious advantage. Hong Kong-invested manufacturers engaged in three sub-sectors[19] accounted for 16.8%, 15.7%, and 11.1% of the total exports of the industry. In the pharmaceutical manufacturing industry, although Hong Kong-invested manufacturers only accounted for a small percentage in total exports, this percentage rose rapidly after 2010 up to 14.1%, reflecting that Hong Kong-invested manufacturers are becoming more active in the pharmaceutical manufacturing industry.

Figure 2-12 Proportion of Hong Kong-invested manufacturers' exports to the total exports of all manufacturers in the industry



Source: China Industrial and Commercial Registration Database and China Customs Enterprise Import and Export Database

18 10 manufacturing industries include electronic and telecommunications equipment; electric machinery and equipment; instruments and cultural machinery; general machinery; pharmaceutical products; raw chemical materials and chemical products; textile; food; toys, games and sports equipment; and pearl, gemstone and precious metal products.

19 Please refer to note 13.

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2.2.5 Ranking of trade status of different industries between China and Hong Kong-invested enterprises[20]

Table 2-2 Relative advantages of Chinese and Hong Kong-invested manufacturers

Industry	Relative advantage of Chinese manufacturers	Relative advantage of Hong Kong-invested manufacturers
Electronic and telecommunication equipment	2	2
Electric machinery and equipment	6	4
Toys, games and sports equipment	1	8
Leather, fur, down and related products	3	5
Textile	4	9
Apparel and other fibre products	5	6
Pearl, gemstone and precious metal products	10	1
Instruments and cultural machinery	7	3
Pharmaceutical products	12	7
General machinery	8	10
Raw chemical materials and chemical products	9	11
Food	11	12

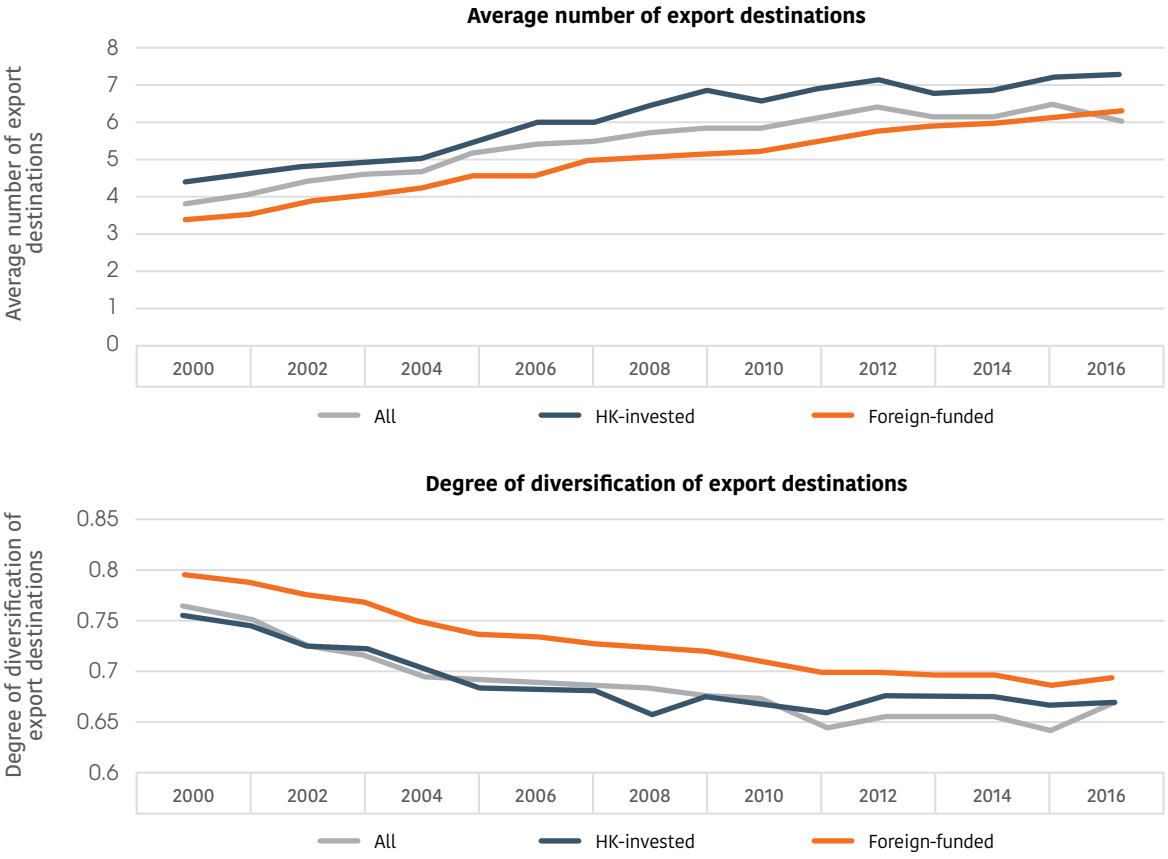
Source: China Industrial and Commercial Registration Database and China Customs Enterprise Import and Export Database (2016)

20 In this table, the "relative advantage of Mainland China" is the revealed comparative advantage ranking of China's exports in the top ten industries. The revealed comparative advantage is a method adopted by the American economist Bela Balassa in 1965 when he measured the comparative advantage of international trade. The revealed comparative advantage is expressed by the share of a certain type of product in the country's exports to the share of that type of product in the total world trade, reflecting the relative advantage of a country's export of a certain industry in comparison with the world's average export level. The "relative advantage of Hong Kong-invested enterprises" refers to the relative position of Hong Kong-invested enterprises in various industries, or the proportion of Hong Kong-invested manufacturer's export value to the total export value of mainland manufacturers in this industry. This table is produced based on 2016 data. Since it is difficult for an industry's trade advantage to undergo disruptive changes in a short period of time, the conclusions in this table still have a strong reference value as of today.

2.2.6 Comparative advantage of Hong Kong-invested manufacturers in the Mainland (by export destination)

During the same period, the average export destinations of Hong Kong-invested manufacturers was about seven, which was higher than the average of other foreign-funded enterprises of about six destinations (including EU countries as a whole). In terms of measuring the concentration of export destinations[21], the average export destination concentration of Hong Kong-invested manufacturers is lower than that of other foreign-funded enterprises, reflecting that HK-invested manufacturers has more international sales networks and serves as a link between the Mainland manufacturing industry and the international market. **(Figure 2-13)**

Figure 2-13 Degree of diversification of the export destinations for different types of enterprises



Source: China Industrial and Commercial Registration Database and China Customs Enterprise Import and Export Database (2016)

21 In this report, the Herfindahl-Hirschman Index (HHI) is used to measure the average export destination and product diversification. Herfindahl-Hirschman Index (HHI) is calculated by squaring the market share of each competing firm in the industry and then summing the resulting numbers, which is used to measure the degree of market competition, that is, the dispersion of the size of the manufacturers in the market. The larger the number, the weaker the market competition, the higher the degree of concentration, and the lower the degree of diversification.

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2.2.7 The five most profitable industries[22]

In this study, the overall profit of the industry was compared with the average profit of enterprises in the industry. The profit data of HK-invested, other foreign-funded, and Mainland-funded manufacturing companies were taken to calculate the top five most profitable industries.

In terms of overall industry profits, the "computer, telecommunication and other electronic equipment manufacturing", the "raw chemical materials and chemical products", and the "electric machinery and equipment" are the three most profitable industries for Hong Kong-invested manufacturers **(Table 2-3)**. The industry advantages of Hong Kong-invested enterprises and other foreign-funded enterprises are similar. Four of the five most profitable industries are the same, and there is no obvious staggered development. In terms of the average profit of enterprises, the average scale of Hong Kong-invested pharmaceutical manufacturing companies in the Mainland is relatively high; while foreign-funded enterprises has a leading position in the automobile manufacturing industry. **(Figure 2-14)**

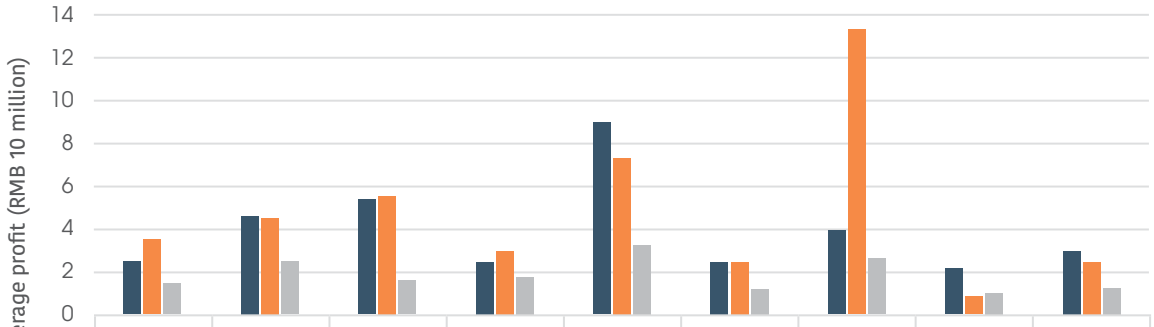
Table 2-3 Top five most profitable industries for all types of companies

Overall industry profit ranking	Hong Kong-invested enterprise	Other foreign-funded enterprise	Mainland-funded enterprise
1	Computer, telecommunication and other electronic equipment manufacturing	Automobile manufacturing	Raw chemical materials and chemical products
2	Raw chemical materials and chemical products	Computer, telecommunication and other electronic equipment manufacturing	Electric machinery and equipment
3	Electric machinery and equipment	Raw chemical materials and chemical products	Nonmetal mineral products
4	Pharmaceutical manufacturing	General machinery	Automobile manufacturing
5	General machinery	Electric machinery and equipment	Processing of food from agricultural products

Source: National Bureau of Statistics (2016)

22 In this part, samples of manufacturing enterprises above the designated size are used for sample analysis (industrial enterprises with an annual main business income of RMB 20 million and a planned total investment of RMB 5 million in fixed assets investment projects).

Figure 2-14 Comparison of average industry profits of various enterprises



	Manu-facturing (Overall)	Computer, telecom-munication and other electronic equipment	Raw chemical materials and chemical products	Electric machinery and equipment	Pharmaceu-tical manu-facturing	General machinery	Automobile	Nonmetal mineral products	Processing of food from agricultural products
HK-invested	2.42	4.56	3.33	2.4	8.85	2.49	3.94	2.13	3.08
Other foreign-funded	3.42	4.55	3.59	2.91	7.17	2.5	13.25	0.99	2.51
Mainland-funded	1.41	2.48	1.62	1.79	3.16	1.09	2.67	1.05	1.24

Source: National Bureau of Statistics (2016)

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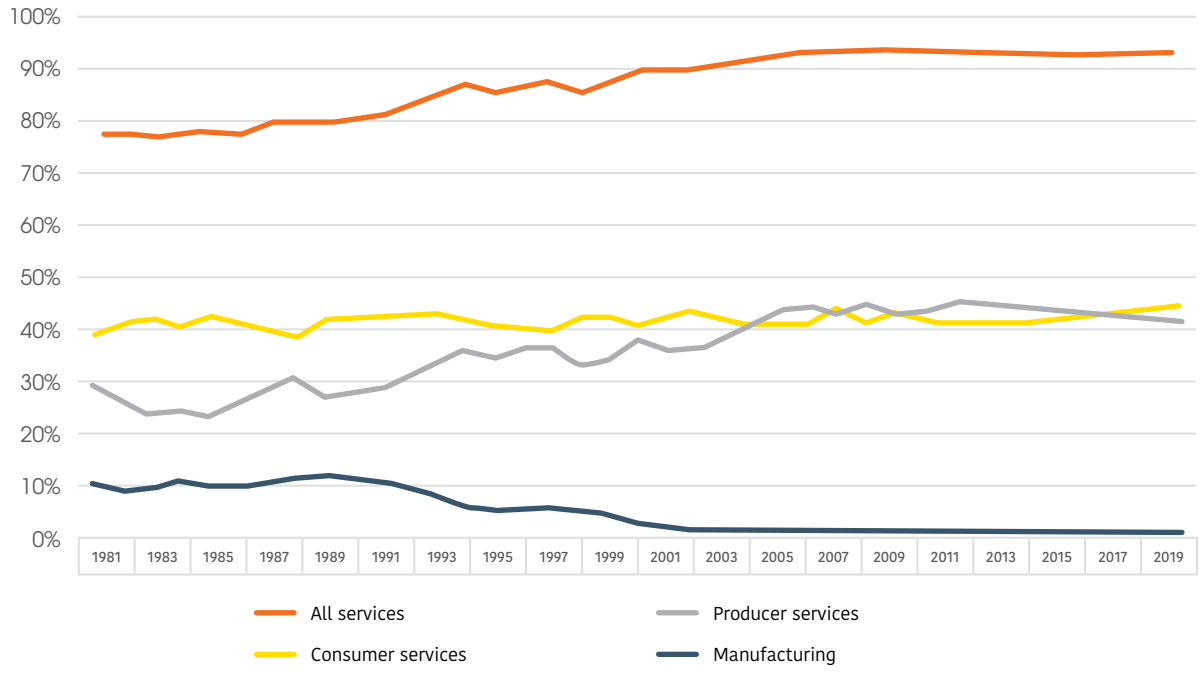
2.3 Recent development of Hong Kong-invested manufacturers

The expansion of Hong Kong-invested manufacturers in the Pearl River Delta has also driven demand for producer services[23], stimulating the rapid growth of Hong Kong's service industry and making it the dominant sector in our economy.

From 1980 to 2019, manufacturing's share of real GDP[24] dropped sharply from 10.4% to 1.03%, while the service industry's share increased from 78% in 1980 to 93% in 2019, creating an illusion that Hong Kong's manufacturing sector is declining. However, according to the calculation of the research team, if the service industry is split into sub-categories, producer services in Hong Kong is on a continuous rise to reach 42.2% of GDP in 2019 **(Figure 2-15)**. Since the local manufacturing base is small, we can reasonably infer that Hong Kong-invested manufacturers in the Mainland have created strong demand for Hong Kong's local producer services, and they have always been a substantial part of Hong Kong's economy. **(see section 2.3.3 for details)**

Figure 2-15 Hong Kong's various industries as a percentage of real GDP from 1981 to 2019



Source: Hong Kong Census and Statistics Department

23 In the mid-1990s, there were a large number of newly-established trading companies in Hong Kong which served as the Hong Kong base for newly-established manufacturing enterprises in the Mainland. In fact, many Hong Kong businesses have dual identities of both Hong Kong traders and the Mainland manufacturers. Trading companies in Hong Kong import manufactured products from factories in the Mainland and then re-export them to other parts of the world. However, most of these companies producing in the Mainland and trading in Hong Kong are also involved in technical support services related to the manufacturing industry, such as product design, sampling, mould manufacturing and production management planning etc., making them different from traditional import and export trading companies.

24 The real GDP is based on the price level of 2018.

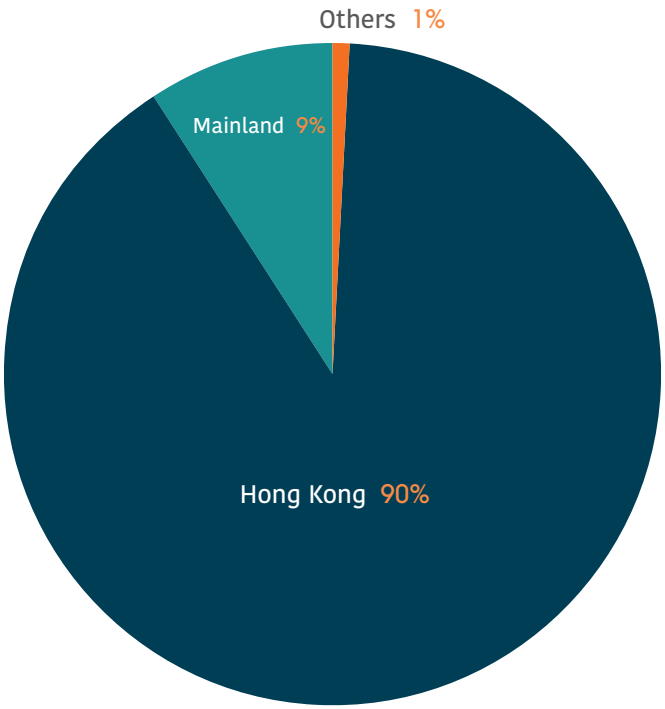
2.3.1 Hong Kong-invested manufacturers headquartered in Hong Kong

According to the questionnaire survey, 90% of the respondents have their headquarters in Hong Kong, and about 10% have their headquarters in the Mainland. **(Figure 2-16)**

According to data from the Census and Statistics Department in 2018, there are 13,120 trading companies engaged in manufacturing-related activities in Hong Kong, accounting for 16.7% of the total number of trading companies in Hong Kong. These companies are responsible for the management of products valued at HK$488.3 billion, mainly produced in the Mainland, to varying degrees.

In that year, the value added by trading companies and manufacturing companies engaged in manufacturing-related activities totaled HK$103.4 billion, accounting for 3.8% of the year's GDP and being 3.8 times of the value-added by the manufacturing industry alone.

Figure 2-16 Headquarter distribution of research respondents



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2.3.2 Distribution of operating functions between Hong Kong and the Mainland

The research team learns the operational functions of the manufacturers' set-up in Hong Kong and the Mainland through questionnaire surveys. The main functions of the Hong Kong enterprises are sales and marketing (including online marketing) (78.4%), finance/accounting/legal support (74.5%), and administrative management (68.4%); Hong Kong enterprises usually engaged less in production-related functions (such as product design, technical support, R&D, engineering technology, etc.) than the Mainland enterprises **(Table 2-4 and Table 2-5)**.

The survey results showed that the functions of the Mainland enterprises and Hong Kong enterprises are significantly different. Mainland enterprises are mostly responsible for R&D, product design and engineering technology, reflecting that Hong Kong-invested manufacturers now tend to assign R&D tasks to the Mainland.

In addition, according to the statistics of the 2019 China Statistics Yearbook on High Technology Industry, although the number of Hong Kong-invested manufacturers

Table 2-4 Functions of HK enterprises of respondents

Functions	Percentage
Sales and marketing (including online marketing)	78.4%
Finance, accounting and legal support	74.5%
Administrative management	68.4%
Product design	46.3%
R&D	37.7%
Technical support	34.2%
Engineering technology (e.g. quality assurance)	22.1%
Manufacturing	15.6%
Others	3.9%

Table 2-5 Functions of the Mainland enterprises of respondents

Functions	Percentage
Manufacturing	82.3%
Engineering technology (e.g. quality assurance)	59.3%
Technical support	55.0%
R&D	55.0%
Product design	49.8%
Sales and marketing (including online marketing)	36.8%
Administrative management	32.5%
Finance, accounting and legal support	20.3%
Others	3.0%

engaged in R&D activities is less than that of foreign-funded enterprises and Mainland-funded enterprises, the average internal R&D expenditures, the ratio of new product revenue to R&D expenditures, and the average number of patents per enterprise are larger than that of other foreign-funded enterprises and Mainland-funded enterprises (see **Table 2-6**), reflecting that Hong Kong-invested manufacturers are quite active in the research and development of high-tech industries. In terms of regional distribution, Hong Kong-invested manufacturers in the Greater Bay Area are no inferior in R&D and innovation capacity of the region. According to the statistics in 2016, the number of patents granted to Hong Kong-invested manufacturers in Guangdong Province (i.e. the number of valid patents) was 38,909 (accounting for 15.0% of the province's total), including 16,675 authorised invention patents (43.2%), 15,196 utility model patents (12.9%) and 7,038 design patents (6.9%). However, Hong Kong-invested manufacturers that invest in R&D are mostly enterprises above designated size, whereas SMEs are still slow in the investment of innovation and technology.

Table 2-6 R&D of various enterprises in high-tech industry[25]

Indicators	Hong Kong-invested enterprise	Other foreign-funded enterprise	Mainland-funded enterprise
Number of enterprises engaged in R&D activities	1,147	1,607	14,207
Average number of R&D staff	87.4	88.9	59.6
Average internal R&D expenditures (million)	28.4	26.3	18.9
Average external R&D expenditures (million)	2.4	1.5	2.7
Number of new products	10,130	12,453	106,519
Ratio of new product revenue to R&D expenditures	19.4%	15.0%	9.3%
Number of patent applications	20,872	20,500	218,146
Number of valid invention patents	32,186	40,232	348,416
Average number of valid invention patents	28.1	25.0	24.5

Source: 2019 China Statistics Yearbook on High Technology Industry

25 According to China Statistics Yearbook On High Technology Industry, "High Technology Industry" (manufacturing) refers to a manufacturing industry with relatively high R&D investment intensity (the ratio of R&D expenditure to the company's main business income) in the national economy, including six major categories of pharmaceutical manufacturing; aviation, spacecraft and equipment manufacturing; electronic and telecommunication equipment manufacturing; computer and office equipment manufacturing; medical equipment and instrument manufacturing; and electronic chemical manufacturing. "Average external R&D expenditures" equals the ratio of total R&D personnel/R&D funds to the number of enterprises with R&D activities. "Ratio of new product revenue to R&D expenditures" equals to (New product sales revenue - funds invested in new product R&D) / funds invested in new product R&D, indicating the return on R&D investment in new products. The larger the value, the higher the return on R&D investment.

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2.3.3 Trends of investing in "Producer Services" in the Mainland

In 2014, the Mainland government and Hong Kong signed the "Agreement between the Mainland and Hong Kong on Achieving Basic Liberalization of Trade in Services in Guangdong" ("Guangdong Agreement"). With Guangdong as the pilot zone, qualified Hong Kong service providers are treated the same as their Mainland counterparts with no further special restrictions. This agreement was extended to the entire Mainland for implementation in 2015, enabling Hong Kong enterprises to invest capital in producer services in the Mainland to fill the market gap. At the same time, Mainland manufacturing companies can take advantage of the mature and professional producer services of Hong Kong companies to carry out industrial upgrading, transformation, and implement the "Go-Out" strategy.

The upgrading and transformation of the Mainland industries have driven the demand for high-end services at the upstream of production chain. The "CEPA Agreement on Economic and Technical Cooperation" signed in 2017 allows Hong Kong-invested enterprises to invest in high value-added producer services such as information transmission, software & IT services, scientific research, and technical services in addition to manufacturing and financial industries, not only facilitating Hong Kong-invested manufacturers to develop upstream producer services but also enhancing their comprehensive role in the industrial value chain of the Mainland.

With the geographical advantage of Pearl River Delta, Hong Kong-invested manufacturers no longer need to establish physical factories in Hong Kong. They continue to carry out production activities in Pearl River Delta and are able to establish more complete and large-scale supply chain ecosystem there. Traditional Hong Kong-invested manufacturers can expand their main production business and also extend to the upstream and downstream of the production chain. Moreover, with the rich international business experience and the geographical convenience of Pearl River Delta, many trade agents integrated upstream and downstream supply chains and even build their own brands and factories. Both of these businesses contribute to the added value of local producer services, such as product design and R&D, network engineering design, intellectual property services, logistics, targeted online marketing, online services and vocational training, etc. Because of this, Hong Kong's producer services have been growing[26] since the 1980s, and its contribution to GDP rose from 28.7% in 1980 to 42.2% in 2019.

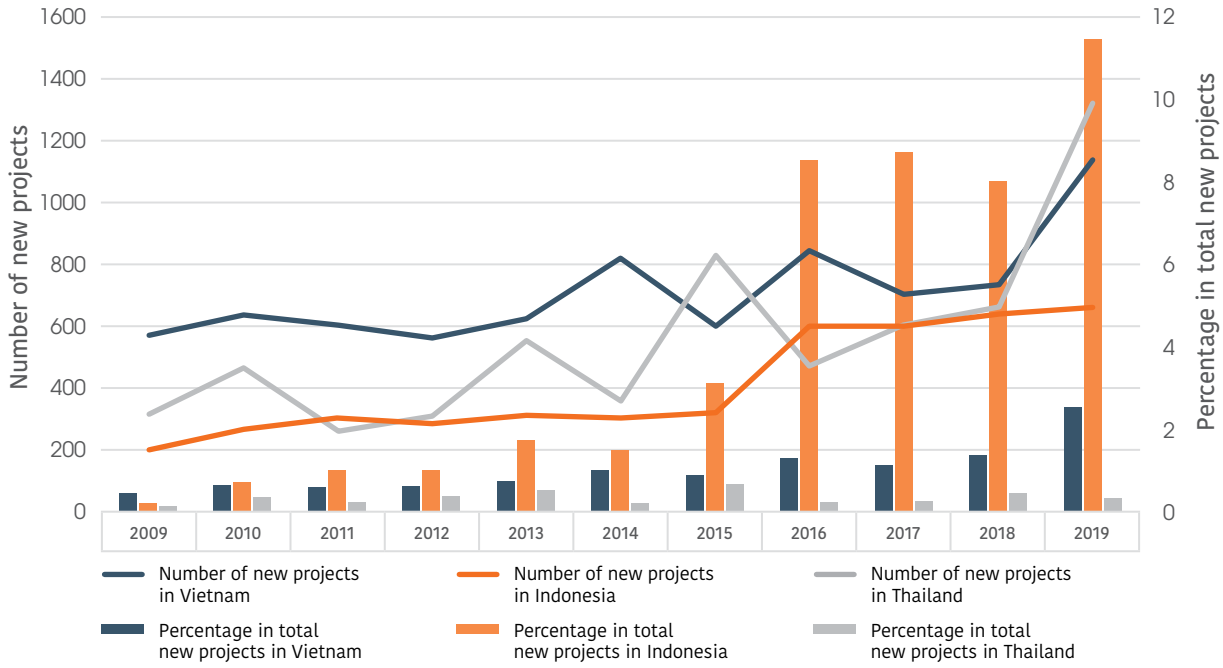
2.4 Recent overseas investment conditions of Hong Kong enterprises

In recent years, the direct investment of Hong Kong in Southeast Asian countries such as Vietnam, Indonesia, and Thailand has increased, and the proportion has risen sharply. In particular, there is a significant trend of Hong Kong-invested manufacturers investing in Southeast Asia. **(Figure 2-17)**

Taking Vietnam as an example, Hong Kong had only 44 new overseas direct investment manufacturing projects in Vietnam in 2005. As of 2019, the number of new overseas direct investment manufacturing projects reached 328, and the proportion of new projects in total foreign investment increased from 4.1% to 8.4%. With the further development of the Asian economy and the new order of global supply chain, more Hong Kong-invested manufacturers are bound to invest in Asian countries. **(Figure 2-18)**

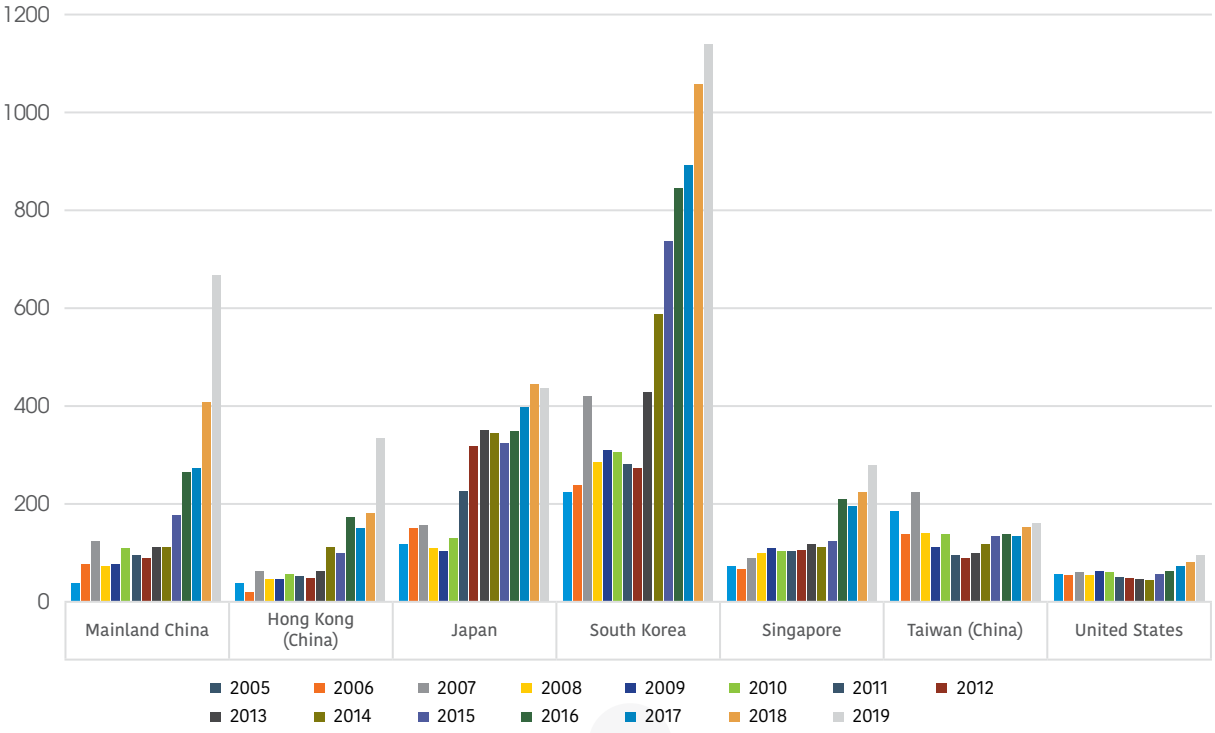
26 According to the research on producer services by Professor Richard Wong Yue-Chim and Professor Tao Zhigang, Hong Kong's service industry is divided into three parts: producer services, consumer services, and government services. Among them, producer services are derived from the overall gross service production value after deducting consumer services and government services.

Figure 2-17 Number and proportion of Hong Kong's direct investment in new manufacturing projects at Vietnam, Indonesia and Thailand



Source: National Bureau of Statistics (Vietnam), BKPM (Indonesia), BOI (Thailand)

Figure 2-18 Number of new projects invested by major countries/regions in Vietnam



Source: National Bureau of Statistics (Vietnam)

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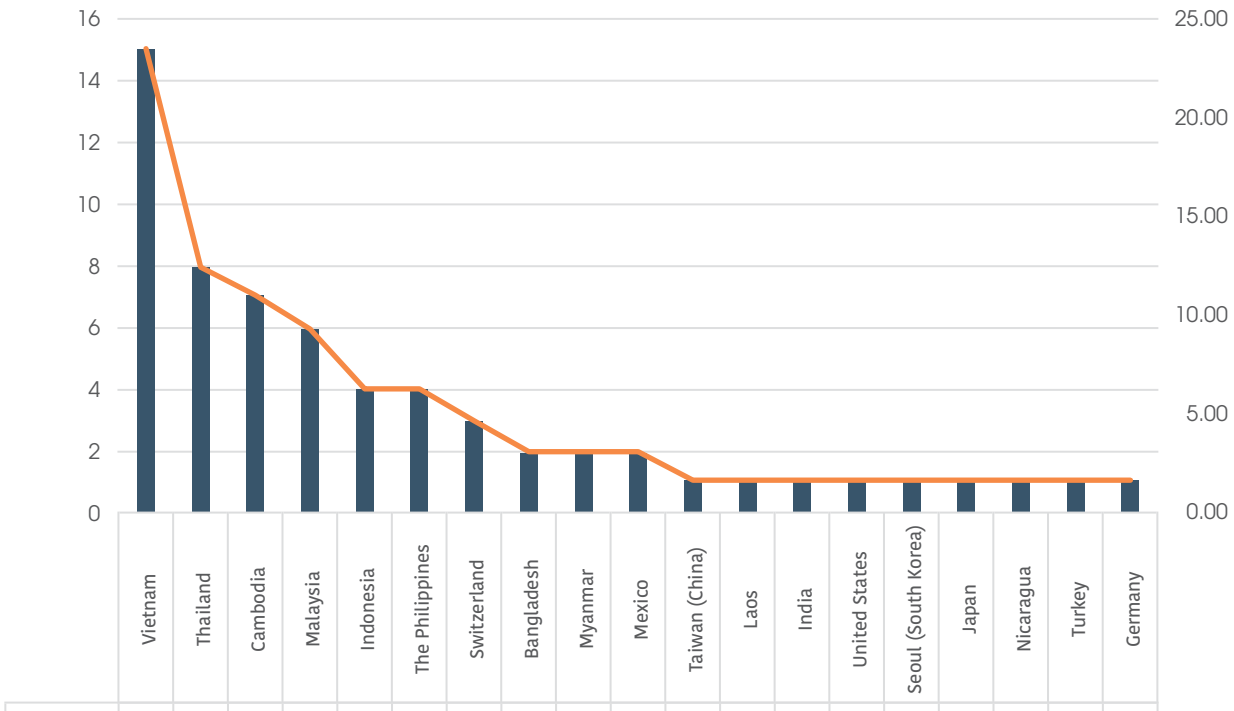
2.4.1 Overseas establishments of Hong Kong-invested manufacturers

According to the data obtained from questionnaire survey, 48 respondents have invested in setting up overseas factories, accounting for 21% of all respondents. The destinations of overseas factories are mainly in Southeast Asia where labour costs are relatively low. Among them, Vietnam, Thailand, Cambodia and Malaysia are the preferred choices for Hong Kong-invested manufacturers to set up their factories overseas **(Figure 2-19)**. This tendency is similar to that shown in **(Figure 2-17)** above.

Most of the Hong Kong-invested manufacturers that set up overseas factories only have one factory. The investment scale of most overseas factories is relatively small, 64.7% of them have an investment amount of HK$100 million or less, while 57.7% of them employ less than 500 workers **(Figure 2-20)**. It can be seen that such overseas investment is still at early stage and the scale of Hong Kong-invested overseas factories is relatively small. In addition, Hong Kong enterprises that set up factories overseas are mostly larger-scale enterprises, among which 84% have annual sales of more than HK$100 million.[27]

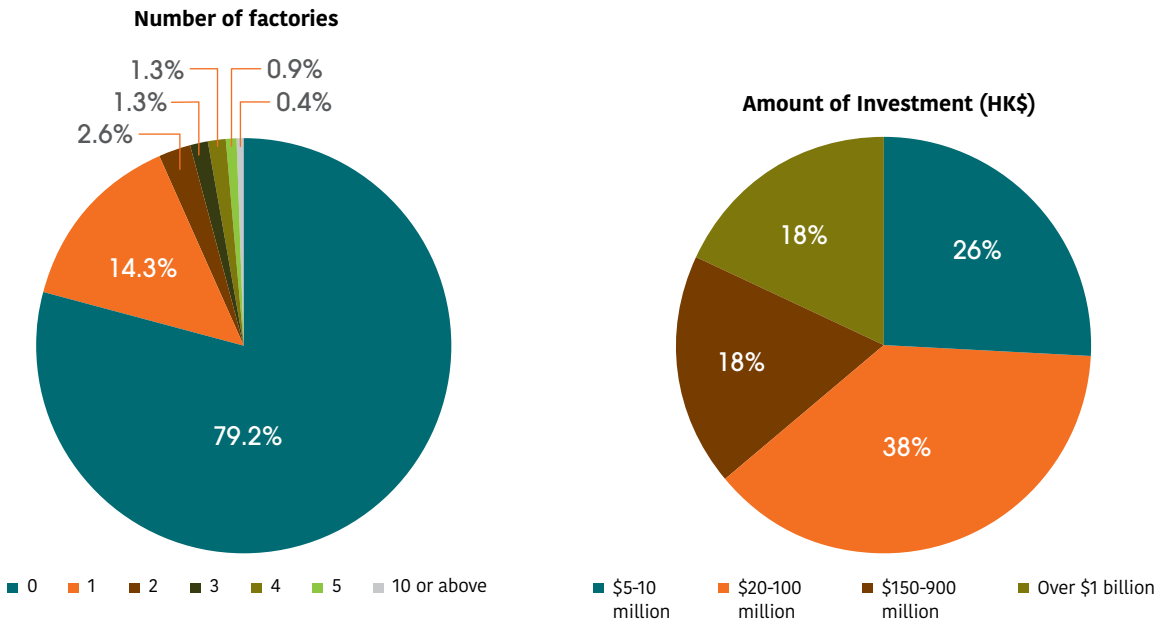
Figure 2-19 Distribution of Hong Kong-invested overseas factories of research respondents

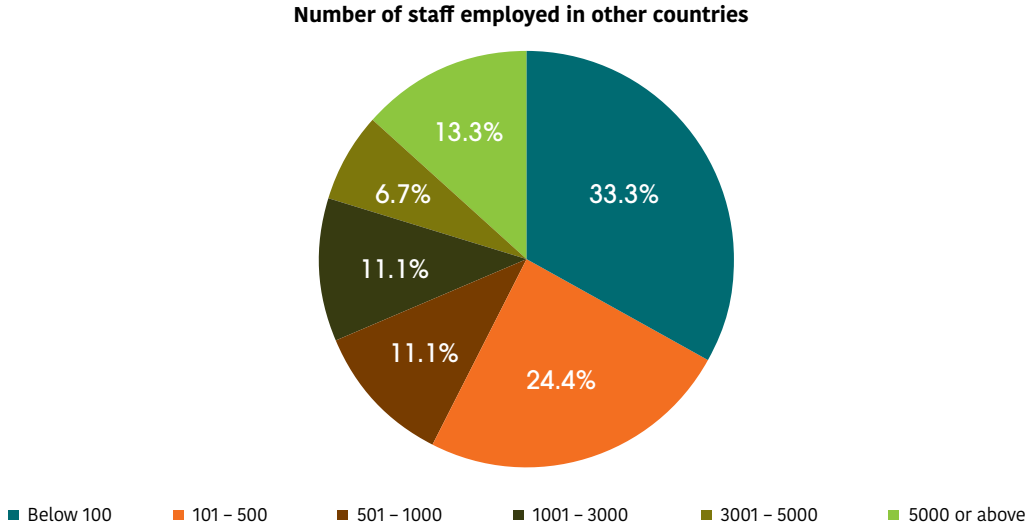


	Vietnam	Thailand	Cambodia	Malaysia	Indonesia	The Philippines	Switzerland	Bangladesh	Myanmar	Mexico	Taiwan (China)	Laos	India	United States	Seoul (South Korea)	Japan	Nicaragua	Turkey	Germany
Number	15	8	7	6	4	4	3	2	2	2	1	1	1	1	1	1	1	1	1
Percentage	23.8	12.7	11.1	9.52	6.35	6.35	4.76	3.17	3.17	3.17	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59

27 See Chapter 4 for the analysis on the factors of Hong Kong-invested manufacturers investing in setting up factories overseas.

Figure 2-20 Number of overseas factories, total investment and employment of research respondents





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According to cross-analysis, Hong Kong-invested manufacturers engaged in textiles and garments (31.3%), electronics and automobiles (18.8%) and plastic products (10.4%) have the largest number of overseas factories. These are also the main industries of Hong Kong-invested manufacturers in the Mainland. **(Table 2-7)**

Table 2-7 Industry distribution of overseas factories and the number of overseas factories

Industry	Number of overseas factories						Total	Percentage
	1	2	3	4	5	Over 10		
Textiles and garments	7	4		2	1	1	15	31.3
Electronics and automobiles	6		2		1		9	18.8
Plastic products	3	1	1				5	10.4
Metal products and machinery	2	1					3	6.3
Jewellery and watches	3						3	6.3
Mould manufacturing	3						3	6.3
Toys	2						2	4.2
Food and beverages	2						2	4.2
Handbags, shoes and accessories	1						1	2.1
Printing	1						1	2.1
Automation and information technology				1			1	2.1
Others	1						1	2.1
Furnitures and lightings	1						1	2.1
Environmental industries	1						1	2.1
Chemicals							0	0.0
Design and innovative industries							0	0.0
Electric products and optical products							0	0.0
Total	33	6	3	3	2	1	48	100

Source: Survey results

Chapter 3

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3.1 Internal constraints faced by Hong Kong-invested manufacturers

3.1.1 Current statistics are unable to reflect the end-to-end contribution of manufacturing to Hong Kong's economy

According to the Census and Statistics Department, an organisation must have physical production facilities in Hong Kong for it to be classified as a manufacturing enterprise, and its value added would be aggregated in the "manufacturing" category of GDP. Nonetheless, Hong Kong's industrial production have expanded abroad, forming a network of regional, large-scale and highly competitive production bases. The headquarters of these manufacturing companies in Hong Kong mainly engaged in manufacturing-related service such as R&D, product design, business development and logistics management. Such producer services activities are directly driven by the offshore production activities of Hong Kong-invested manufacturers. However, such activities are not clearly differentiated in local economic statistics, nor has it been regarded as manufacturing-related output value.

Taking 2018 as an example, the output value of manufacturing-related trading companies and manufacturing companies accounted for a total of 3.8% of the GDP **(see section 2.3.1)**. It has not yet included the output value of other manufacturing-related services driven by industrial upgrading and transformation, such as scientific research, product design, cloud networking technology, intellectual property services and vocational training.

According to the current government statistical data, the ratio of the manufacturing industry to GDP has dropped significantly from 24%[28] in 1980 to 1% in 2018 over the past 40 years, which was often misinterpreted as a decline of the local manufacturing industries. Over time, this impression of Hong Kong's industrial decline has become more ingrained, causing the government to overlook the indirect contribution of manufacturing industry to Hong Kong's economy. This has affected long-term policy directions and deterring younger generations to build a career in the manufacturing sector.

Over the years, manufacturing sector has undergone rigorous transformation where diverse producer service sectors have been developed and become mature, forming an extended and interlocking industrial system. The traditional narrow definition of "manufacturing" hinders our understanding of manufacturing on the overall economy. In order to assess the impact of one industry on other economic activities, various economic analysis institutions are now inclining towards disaggregating the service sector on top of the normative industrial classification system. Economic analysis agencies such as Organization for Economic Cooperation and Development (OECD), KPMG and PricewaterhouseCoopers (PwC) have already applied the above classification.

28 This percentage is based on the GDP calculated at the market price in 1980.

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In terms of official organisations, the National Bureau of Statistics of China has disaggregated the "service industry" into "producer services" and "life services" in 2015. The producer services broadly include R&D, product design, technical services, logistics, transportation, warehousing, courier services, information services, financial services, energy-saving and environmental protection services, manufacturing leasing services, business services, human resource management and training services, wholesale brokerage agency services and production support services etc. This classification has great reference value in understanding the scope of producer services.

In modern industries, there is a mutually dependent relationship between manufacturing and producer services. It is necessary for us to adopt a broader definition of manufacturing industry in order to understand the actual contribution of manufacturing sector to Hong Kong's economy. The manufacturing "Industry" should broadly include all related processes starting from scratch to the final delivery of a finished product to consumers, including economic activities in manufacturing and producer services such as product material sourcing, appearance and function design, moulding and assembly, quality inspection, transportation and logistics and after-sales service.

3.1.2 Insufficient industry, academia and research collaboration to commercialise scientific research outcomes

Transforming knowledge and scientific research outcomes into new tradable products within the shortest time possible is critical to the manufacturing industry in maintaining its competitiveness. Generally speaking, the academic and research sectors focus more on theories and basic research, while manufacturers emphasise on practicality and return of investment. Therefore, it is essential for industry, academic and research sectors to work together in order to industrialise research results for creating economic and social value. This also helps universities keep abreast of current industrial application trends and contribute to cutting-edge research activities needed for global development.

Hong Kong has favourable conditions for the development of innovative technology and the promotion of manufacturing upgrades[29]. However, the investment in local scientific research is relatively lagging behind other advanced economies in the region. In 2018, Hong Kong's R&D expenditure was approximately HK$24.5 billion, which was 0.9% of the GDP. This figure is significantly lower than that of South Korea (4.8%)[30], Japan (3.3%)[31] and Singapore (1.8%)[32]. In 2019, the R&D expenditure (RMB 2.17 trillion) in China accounted for 2.19% of GDP, while the figure of Guangdong Province reached 2.8%, with its regional innovation capability ranking top in the country.

Though Hong Kong has excellent R&D capabilities, it seems to be inadequate in terms of industrialisation. For example, the patents of *MyCar* electric car developed by the Hong Kong Polytechnic University and the microdisplay in the Google Glass developed by the Hong Kong University of Science and Technology were finally sold to American and Taiwanese companies since there were no companies in Hong Kong willing to invest in their commercialisation and mass production. Another example is *Qi*, the wireless charging

29 Judging from the current situation in Hong Kong, there are good objective conditions in science, education, fundraising and regulatory system. According to the 2020 Bloomberg Innovation Index, Hong Kong ranks 7th and 15th in the world in terms of "Productivity" and "Patent Activity" respectively. In the 2019 Global Innovation Index, Hong Kong ranked 13th in the world, among which it ranked third and fourth in the two innovation input factors, "Market Sophistication" and "Infrastructure" respectively. In addition, Hong Kong has outstanding performance in terms of artificial intelligence and computer science.

30 World Bank, 2020, Research and Development Expenditure (% of GDP).

31 Same as reference 30.

32 National Research Foundation, Agency for Science, Technology and Research Singapore, December 2019, National Survey of Research and Development in Singapore, December 2019.

technology developed by the University of Hong Kong in 1999, who took more than ten years to become the international standard for inductive charging. For many years, Hong Kong enterprises were reluctant to invest into *Qi*, until it was discovered by international companies such as Samsung and Philips in 2006. The above examples show how important industrial investment is for the commercialisation of pioneering scientific research outcomes.

As the local manufacturing industry is dominated by SMEs, only very few of them are willing to invest in scientific research due to limited technical knowledge and R&D resources. From the industry's point of view, universities mainly focus on basic research and theories while the business sectors are more inclined to applied research and practical applications. Therefore, the government should strengthen its role as a facilitator to establish a platform for industry, academia and research collaboration for turning latest technology and research results into real-world applications.

3.1.3 New industrial policies in the Mainland motivates Hong Kong-invested manufacturers to change business strategies

Since the reform and opening up of the Mainland, Guangdong Province has served as the most important production base for Hong Kong-invested manufacturers. The region benefited from the rapid economic growth driven by industrialisation to develop a mature industrial chain and become the world's factory. Since 2000, the surging costs of energy, land and labour have posed huge pressure on the processing trade model of the "three-plus-one" trading mix (manufacturing with materials, designs or samples supplied and compensation trade) adopted by manufacturers in Guangdong region, which has low margin and high resource consumption. The emergence of the Yangtze River Delta and the Bohai Economic Rim economic circles has also intensified the competition across regions.

Over the years, the Mainland government made continuous adjustment to the industrial policy of Pearl River Delta to direct the region's strategic role in the national economy. Ever since 2000, the Pearl River Delta area has formed a diversified industry profile featuring nine pillar industries[33] while Shenzhen was developed into a technological innovation hub. The "Plan for the Reform and Development of the Pearl River Delta" announced in 2009 and the "Three-year Action Plan on the Implementation of Restructuring and Upgrading of Industries of Guangdong Province", "Five-year Blueprint for Intelligent Manufacturing" and "Advanced Equipment Manufacturing on the West Bank of the Pearl River" implemented in 2015 promoted the high-end industrial development in the Pearl River Delta. The region gradually built up competitive advantages and established a strategic position in the global production chain. Such adjustment of industrial policies prompted Hong Kong-invested manufacturers in traditional industries (including textiles, garments, shoes, plastics, leather and toys etc.) to upgrade their business models to align with the national development objectives, or otherwise there will be huge difficulty for them to continue operating in the region.

33 Including three new industries (electronic information; electric machinery and special purposes equipment; petroleum and chemicals), three traditional industries (textile and apparel; food and beverage; construction materials) and three high-potential industries (logging and papermaking; pharmaceuticals; automobile and motor vehicles).

3.1.4 Tightening environmental protection laws in the Mainland

In order to promote environmental governance and industrial transformation, the Mainland has rolled out new environmental protection policies and took stringent enforcement actions in recent years. Hong Kong-invested manufacturers are facing considerable pressure to upgrade their production facilities within limited time to meet regulatory requirements. In 2015, the Mainland authorities updated the *Environmental Protection Law*, imposing heavy penalties on companies who discharge harmful substances or pollutants over limits. The relevant administrative departments can impose a fine to the companies by the number of days until rectification is finally completed, without specified upper limit. In addition, the law enforcement agencies have the authority to impose administrative detention on the company representative. In 2018, there were 21,696 cases of violation of the latest Environmental Protection Law in Guangdong Province, an increase of 7.2% compared with 2017. The total amount of penalties reached RMB 1.72 billion with 671 cases of administrative detention[34]. The Department of Ecology and Environment of Guangdong Province indicated that law enforcing officers were dispatched for 119,000 times and made over 68,000 company inspections from January to September in 2019. Over 11,500 environmental violation cases were identified with penalties of RMB 1.08 billion in this period.

With the implementation of *Environmental Protection Tax Law* and the updated *Water Pollution Prevention and Control Law* in 2018, many Hong Kong-invested manufacturers needed to seek assistance from professional consultants to make rectification on their production facilities to comply with the latest laws and regulations. In order to cope with the new policies, Hong Kong-invested manufacturers need to pay for facility rectification in a very short period of time. Factories are not allowed to resume operation until they can comply with the legal requirements.

3.1.5 Labor Contract Law increases manpower costs for enterprises

The *Labor Contract Law* was enacted on 29th June 2007 and officially took effect from 1st January 2008. The business communities believe that the new law has a profound impact on the flexibility of employee recruitment and labour costs.

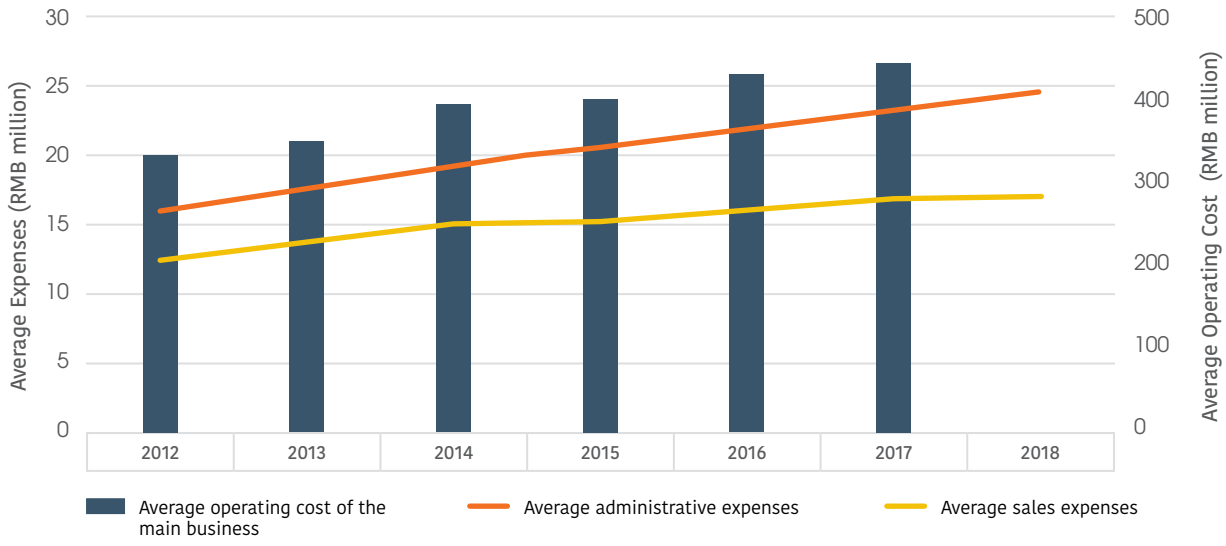
As stipulated in Article 14 of the *Labor Contract Law*, an employment contract without a fixed-term shall be concluded if the employee has already worked for the employer for 10 full years consecutively, or if the employee has completed two fixed-term contracts consecutively. The employer cannot dissolve the employment contract unless the employee seriously violates the internal company regulations or becomes incompetent for the job. Financial compensation must be made if the contract is terminated. The calculation method is based on the working period in the company, and one month's salary is paid for every full year of employment. Hong Kong-invested manufacturers believed that this has restricted their flexibility in employment and also increases labour costs.

34 21,696 cases of environmental violations identified by the Department of Ecology and Environment, the number of administrative detention cases ranked the top across the country over the past year (Southern Daily, 22nd January 2019). http://epaper.southcn.com/nfdaily/html/2019-01/22/content_7777696.htm

3.1.6 Increasing average operating cost of foreign-funded and Hong Kong, Macao and Taiwan-funded enterprises

According to the National Bureau of Statistics of China, the average operating cost of the main business of foreign-funded and Hong Kong, Macao and Taiwan-funded enterprises increased from RMB 330 million in 2012 to RMB 440 million in 2017, while the average administrative expenses increased from RMB 15.784 million to RMB 24.047 million. The average sales expenses also increased by 42.9% (Figure 3-1). Due to the increase in labour, land and environmental compliance expenses, Hong Kong-invested manufacturers suffered from higher production costs and increasing operating expenses such as sales and management expenses.

Figure 3-1 Average cost and expense of foreign-funded and Hong Kong, Macao, and Taiwan-funded enterprises in Mainland China[35]



Source: National Bureau of Statistics of China

35 There is no available data for average operating cost in 2018.

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3.2 Challenges and opportunities brought by the external business environment to Hong Kong-invested manufacturers

3.2.1 China-US Trade Disputes

In August 2017, the US Trade Representative initiated an investigation under Section 301 of the Trade Act. Following the Section 301 investigation findings released in March 2018, US imposed additional tariffs on certain Chinese imports. It is expected that President Biden will continue the hardline policy against China after he took the office in January 2021. In an interview with The New York Times, President Biden stated that he would not remove the 25% tariff imposed on nearly half of China's imports under the Trump administration, and he would not cancel the Phase One Trade Deal between China and the US[36]. The political rivalry has caused tensions in China-US trade relations, which is expected to become the norm in the future.

Once the United States imposed additional tariffs on China's imports, Hong Kong-invested manufacturers faced customer requests for price reductions, shipments cutbacks and even order cancellations. Hong Kong-invested manufacturers who responded to the research questionnaire revealed that the most impacted businesses include dyed textiles (-50%), spinning and fabrics (-30% to -50%), jewellery (-30%), automation equipment (-30%), electronic components (-20%), woven garments (-20%) and metal processing products (-10% to -20%).

Since majority of products manufactured by Hong Kong-invested manufacturers in the Mainland have a profit margin lower than the additional tariff rate, the additional tariff is a heavy financial burden on businesses. Industries such as weaving, spectacles and toys suffered less as most of the tariffs imposed are levied upon buyers and consumers. In industries such as dyed textiles, woven garments, furs, jewellery, watches, furniture, electronic components, automobiles, aviation and precision parts, metal processing products and automation equipment, most of the additional tariffs are shared between buyers and sellers.

The research team compared the level of impact of China-US trade disputes on different Mainland companies. 56% of Hong Kong-invested manufacturers have at least

Table 3-1 Impact of China-US trade dispute on different types of Mainland enterprises[37]

Type of enterprise	Proportion of affected enterprises	Average additional tariff rate
Mainland-funded enterprises	47.2%	4.2%
HK-funded enterprises	56.4%	3.1%
Other foreign-funded enterprises	53.8%	4.0%

Source: China Industrial and Commercial Registration Database and China Customs Enterprise Import and Export Database

36 Biden: Trump's tariffs on China will not be removed; US will unite allies against China. (BBC, 4th October 2020). https://www.bbc.com/zhongwen/trad/chinese-news-55184463

37 The proportion of affected enterprises is the proportion of enterprises whose export products are included in the sanctions list of the United States. The formula for the average additional tariff rate is ∑ the export value of product *i* / total export value of this type of enterprise × additional tariff rate of product *i* is subject to; of which the additional tariff rate for unaffected products is 0%.

one type of product being featured in the sanction list by the US, which is higher than that of Mainland-funded and other foreign-funded manufacturers. On the other hand, the additional tariff of Hong Kong-invested manufacturers is 3.1% on average, which is far lower than the 4.2% of Mainland-funded enterprises and 4.0% of other foreign-funded enterprises **(Table 3-1)**. This reflects that Hong Kong-invested manufacturers are still more competitive in price than the Mainland and other foreign-funded enterprises despite the tensions in trade relations.

3.2.2 The Regional Comprehensive Economic Partnership

In mid-November 2020, China signed the Regional Comprehensive Economic Partnership ("RCEP") with ten ASEAN countries, Japan, South Korea, Australia and New Zealand. The partnership is expected to direct free trade development across the 15 Southeast Asia and Oceania economies. Although RCEP is not as comprehensive as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership ("CPTPP") in terms of zero-tariff coverage, the RCEP laid a solid foundation for economic recovery in the Asia-Pacific region and the growth of Southeast Asian markets as it was signed at the opportune time in the post-COVID-19 period.

The implementation of RCEP will gradually remove trade barriers across the region. It is expected that trading across Asia will become more convenient, the trade volume will continue to increase and an interconnected regional supply chain will be formed. Advanced components will be supplied by Japan and South Korea, while manpower and raw materials will be provided by countries such as Vietnam and Indonesia. As an important entrepôt, financial and logistics centre, Hong Kong will strengthen its role as the coordination and management hub on the global supply chain.

The RCEP cumulative rules of origin will benefit many Hong Kong-invested manufacturers in the Mainland. For example, assuming that 20% of the dishwashers exported from China to Indonesia are domestically value-added. According to the China-ASEAN Free Trade Agreement, the domestic value-added ratio must reach 40% to be eligible for zero tariff. However, under RCEP, the value-added components of the product in other RCEP regions, such as 10% value-added components from Japan and South Korea, can be aggregated to the total value-added under the cumulative rules of origin to become a total of 40% value-added, making it eligible for Indonesia's zero-tariff treatment. The cumulative rules of origin will stimulate trade within the region and drive the production demand for intermediate products, resulting in the integration of industrial supply chain. SMEs in RCEP will be more inclined to purchase parts and components produced in the upstream supply chain in the region (such as China, Japan and South Korea) and use the accumulated value-added to reduce tariff costs.

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3.2.3 The economic centre of gravity shifting towards Asia

With more than half of the world's population living in Asia and the Asian governments' active pursuit of economic development, it has become the most influential regional economy in the world over the past two decades. Asia accounted for about a quarter of global trade in goods ten years ago, it has now risen to about a third. During the same period, the share of capital flows in the region increased from 13% to 23% while Asia's share of global air passengers also surged from 33% to 40%. With the rapid economic growth, Asia's consumption power is also increasing. Asia's share of global real GDP (calculated by purchasing power parity) rose from 32% to 42% from 2000 to 2017. The region's contribution to global consumption increased from 23% to 28%; while its proportion of global middle-class population increased from 23% to 40%[38].

In recent years, the ASEAN has been regarded as the most dynamic economies in the world. ASEAN as-a-whole is the world's third-largest market after China and India, with a population of 650 million[39], accounting for approximately 8.5% of the world's population. In 2018, ASEAN's GDP reached US$3 trillion and was the fifth largest economy in the world[40]. The region's GDP in 2018 (US$3 trillion) was almost double of the 2008 figure (US$1.6 trillion in 2008), and even five times of the 2000 figure (US$0.6 trillion). The GDP per capita in ASEAN shows a similar trend, reaching US$4,601.3 in 2018, compared with US$3,299.3 in 2010 and almost four times when compared to the 2000 figure (US$1,195.0).

As for real GDP, the ASEAN had an average annual growth rate of 5.3% from 2000 to 2018[41].

In countries such as Singapore, Malaysia, Thailand, the Philippines, Indonesia and Vietnam, the market potential and average purchasing power have continued to increase in recent years, especially in terms of average household income[42]. The Asian region is not only a highly efficient industrial production area but also a consumer market with increasing purchasing power.

In addition, the proportion of middle class in China and Southeast Asia continues to grow. The region represents the largest cluster of middle class in the world with huge consumer purchasing power. For China, the domestic middle class accounted for 35% of the global total in 2017, ranking the first. The United States, which ranked second, fell far behind with only 7% of the global total[43]. The middle class in Southeast Asia is also growing rapidly. In 2010, the proportion of the middle class in Southeast Asia with a daily consumption capacity of US$10 to US$100 was 29%; this proportion is expected to rise to 65% of the population in 2030. In other words, the middle class in Southeast Asia will double in the next ten years with growing disposable income, and their appetite for goods and services will become more diverse[44].

3.2.4 The impact of COVID-19 on the Mainland industrial chain

During the peak period of the COVID-19 outbreak, many countries and regions have adopted flight suspension, border control, immigration control and import restrictions, which disrupted multiple cross-border

38 McKinsey Global Institute, September 2019, The Future of Asia.
39 The ASEAN Secretariat, October 2019, ASEAN Key Figures 2019.
40 Same as reference 39.
41 Same as reference 39.
42 The Nielsen Company, 2019, What's Next in Southeast Asia Seizing Untapped Opportunities in Asia's Next Growth Frontier.
43 Global Wealth Report 2016 & Global Wealth Report 2017 published by Credit Suisse Research Institute.
44 PwC, The future of ASEAN-Time to Act, 5/2018.

logistics channels. Many factories were forced to suspend their operation, posing a huge impact on the manufacturing supply chain. The key intermediate products, semi-manufactured products, components and production equipment required for industrial production suffered from different degrees of supply chain disruption risk. The core advantage of Mainland manufacturers in international division of labour lies in their strong assembly capabilities, whereas most of the core components, advanced materials and high-tech equipment rely on import. Mainland manufacturers are facing huge pressure on global procurement, price increases and even the risk of supply chain disruption.

In order to fill the supply chain gap exposed by the pandemic, the Mainland government is determined to speed up the transformation and upgrading of the manufacturing industry and strategically tackle the issues on core technologies. In the 5th plenary session of 19th CPC Central Committee, the Central Government proposed to achieve sci-tech self-reliance and self-strengthening at higher levels. By encouraging R&D and grooming domestic key suppliers (use domestic manufactured parts to substitute for import), this can strengthen the flexibility in supply chain for both traditional industries and strategic emerging industries. The "Action Plan for the Development of Latest Electronic Information Strategic Pillar Industry Clusters in Guangdong Province (2021-2025)" issued by Guangdong government in 2020 outlined the development blueprint with a series of specific policy goals and actions[45].

For Hong Kong-invested manufacturers that have set up R&D centres in the Mainland, this is undoubtedly an encouragement and motivation which provides sufficient market space for innovative production technology. Hong Kong-invested manufacturers should take this opportunity to propel towards the upstream of the industrial chain, invest in the high-end production and R&D in the Mainland, and enhance their leading role in the production value chain.

The COVID-19 outbreak across the globe has affected overseas market demand, posing an impact on the export orders of Hong Kong-invested manufacturers. In June 2020, the State Council published the "Implementation Opinions on Supporting Domestic Sales of Goods Originally Produced for Export" to assist foreign-funded enterprises that were originally engaged in exports to enter the Mainland market in different ways. Measures include simplifying the certification procedures for export-oriented products to be sold domestically, allowing foreign trade companies to accurately understand the domestic consumption needs, encouraging financial institutions to provide financial support for export-oriented products to be sold domestically, and increasing liquidity capital loans and other revolving credit support. In July, the State Council suggested the dual-circulation development pattern as the means to stabilize domestic economic development. This is beneficial for Hong Kong-invested manufacturers to shift their export-oriented business to domestic sales.

45 The "Action Plan for the Development of Latest Electronic Information Strategic Pillar Industry clusters in Guangdong Province (2021-2025)" jointly issued by Guangdong Development and Reform Committee, Guangdong Department of Science and Technology and other departments clearly pointed out that in the coming five years, Guangdong will be built into a global cluster of new-generation communications equipment, new networks, mobile phones and new smart devices, semiconductor components and innovative information technology applications. And in 2025, Guangdong will strive to build 2 national-level manufacturing innovation centres, invest more than 6% in the R&D of key leading enterprises, and build 5 new-generation information and communication (5G) industrial parks, 5 smart devices industry bases, and 5 semiconductor components and smart sensor industry bases. In the field of semiconductor components, Guangdong will make up for shortcomings in integrated circuit manufacturing, develop related equipment and raw material industries, and build an international leading integrated circuit industry base, including supporting the establishment of the National Xinhuo Platform for Innovation and Entrepreneurship in Guangzhou, Shenzhen, Zhuhai and other places. The province will support the establishment of new electronic components industry bases in Shenzhen, Zhaoqing and other places, and the establishment of an integrated circuit key project library. For Hong Kong-invested electronics manufacturers that are good at upstream R&D, the above plan provides a clear blueprint for future development.

Chapter 4

Strategies adopted by Hong Kong-invested manufacturers

Over decades of development, the global supply chain now basically evolves around the Mainland China, the United States and Germany. The United States is mainly engaged in scientific and technological research and development; Germany specialises in advanced manufacturing; while the Mainland China is responsible for traditional manufacturing. In the past, reducing costs and increasing efficiency are the major objectives of supply chain development. However, the global political and economic environment has undergone drastic changes in the past decade. The rapid technological advancement, continued China-US trade disputes and the COVID-19 pandemic have led the global supply chain to undergo major adjustments. It is anticipated that the supply chain will become more distributed with multi-centre operation in order to balance the cost-effectiveness and stability.

Through questionnaire surveys and focus group interviews, the research team found that Hong Kong-invested manufacturers have adopted four major transformation strategies in response to the emerging challenges and opportunities. Manufacturers may adopt more than one strategy according to their respective business nature, operational needs and business goals.

4.1 Strategy 1: "China+1"

Due to the rapid increase in labour costs in the Mainland China (including salaries, social insurance fees and employee benefits), labour-intensive manufacturers have begun to shift their production lines from the Mainland China to lower-cost overseas locations, with Southeast Asia region as a major destination. Considering the huge Chinese consumer market with strong purchasing power and its mature manufacturing ecosystem that can hardly be replaced by any other economies, most Hong Kong-invested manufacturers still maintain their production base in the Mainland China despite overseas expansion. This "China+1" strategy serves to help manufacturers achieve better cost control and distribute supply chain risks.

4.1.1 Nearly a quarter of Hong Kong-invested manufacturers adopt "China+1" Strategy

The survey shows that 23% (53 companies) of the respondents adopt the "China+1" strategy to cope with the China-US trade dispute. 32 of them have already set up production lines outside the Mainland China while the other 21 of them are consideration doing so. The survey discovered that companies that set up overseas manufacturing facilities, regardless of whether their major markets are in Europe and the US, the Mainland, or both, have adopted the "China+1" strategy at a far higher rate than those have not established overseas factories yet.

Table 4-1 Relationship between market locations and overseas establishments in "China+1" manufacturers

Target market	Overseas factories	Percentage of enterprises adopting "China+1" strategy
Mainland China	Yes	80.0%
	No	14.7%
Both	Yes	65.2%
	No	12.1%
Europe and the US	Yes	65.0%
	No	10.0%

4.1.2 More than 60% of respondents cited customers' requirements as the main reason

Hong Kong-invested manufacturers opt for the "China+1" strategy mostly due to customers' requirements (62.3%, 33 companies), coping with the increase in production costs in the Mainland (56.6%, 30 companies) and avoiding the sudden increase in US tariffs (54.7%, 29 companies). The majority of production chains adjustments are based on customers' requirements, indicating that Hong Kong-invested manufacturers have a relatively passive role in the production chain.

In addition, 39.6% of the respondents (21 companies) adopted the "China+1" strategy to both avoid the sudden increase in US tariffs and the increasing production costs in the Mainland; 28.3% of the respondents (15 companies) believed that all of the above three reasons constitute to their adoption of "China+1" strategy. At the same time, 37.7% of the respondents believe that "China+1" strategy helps them maintain stable labour supply, which may also be part of the reason for the shift of production location. **(Table 4-2)**

In terms of industrial sectors, no matter for labour-intensive industries like textile and apparel, or technology-intensive industries like electronics[46], manufacturers intend to avoid the sudden increase in US tariffs, accounting for 48.3% and 51.7% respectively. On the other hand, 60% of the respondents from the labour-intensive industries choose "Coping with the increasing production costs in the Mainland" as the reason for adopting "China+1", showing that cost reduction is a major driver of taking this strategy. **(Table 4-3)**

In general, labour cost constitutes to a significant portion of total operating costs in labour-intensive industries. Southeast Asian countries can provide an abundant supply of relatively low-cost skilled workers to fulfill the needs of labour-intensive businesses. Therefore, these companies tend to conduct labour-intensive production lines in overseas factories while the Mainland factory remains the R&D base to provide technical support and talent training for overseas establishments. The production lines in Southeast Asia can reduce the overall operation cost with relatively controllable initial investment.

Table 4-2 Reasons for the respondents to adopt the "China+1" strategy

Reason	Number of companies	Percentage
Customer requirements	33	62.3%
Coping with the increasing production costs in the Mainland	30	56.6%
Avoiding the sudden increase in US tariffs	29	54.7%
Expanding overseas markets	23	43.4%
Maintain stable labour supply	20	37.7%
Convenience in materials procurement	2	3.8%

46 According to the "Classification of Strategic Emerging Industries (2018)" and the "Classification of High Technology Industry (Manufacturing Industry) (2017)" published by the National Bureau of Statistics of China, respondent enterprises belonging to electronics and automobiles, mould manufacturing, metal products and machinery, design and creative industries and environmental industries are collectively classified as "technology-intensive companies"; those belonging to other industries, including textiles and apparel, toys, chemicals, plastic products, printing, furniture and lighting, jewellery and watches, are collectively classified as "labour-intensive companies".

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As for technology-intensive companies, the labour cost only accounts for 10% or less of the overall operating costs. However, the initial investment for advanced machinery, production systems and workers training required in new factory is huge. If the products manufactured by these companies are on the exclusion list of Section 301 tariffs, or if it is difficult to find alternative suppliers for the products, their customers are more likely to be exempted from the tariff and therefore these companies have less urgency in setting up factories overseas.

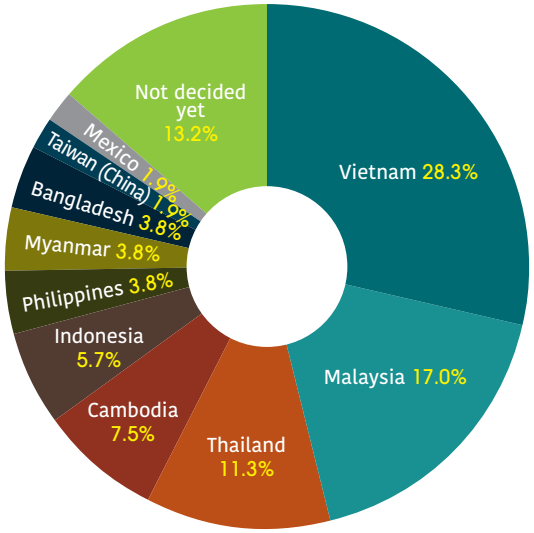
4.1.3 Destinations of relocating the production line

The survey indicated that nearly 80% of respondents which adopted the "China+1" strategy choose to set up new production lines in ASEAN countries (except Singapore and Brunei). The top three destinations are Vietnam (28%, 15 companies), Malaysia (17%, 9 companies) and Thailand (11%, 6 companies). **(Figure 4-1)**

Table 4-3 Proportions and reasons for adapting "China+1" strategy by industry type

Industry Type	Proportion of enterprises adopting "China+1" strategy	Proportion of enterprises aiming to avoid the sudden increase in US tariffs	Proportion of enterprise aiming, to cope with the increasing production costs in the Mainland
Technology-intensive company	47.2%	51.7%	40.0%
Labour-intensive company	52.8%	48.3%	60.0%

Figure 4-1 Destination of "China+1" manufacturers in the survey

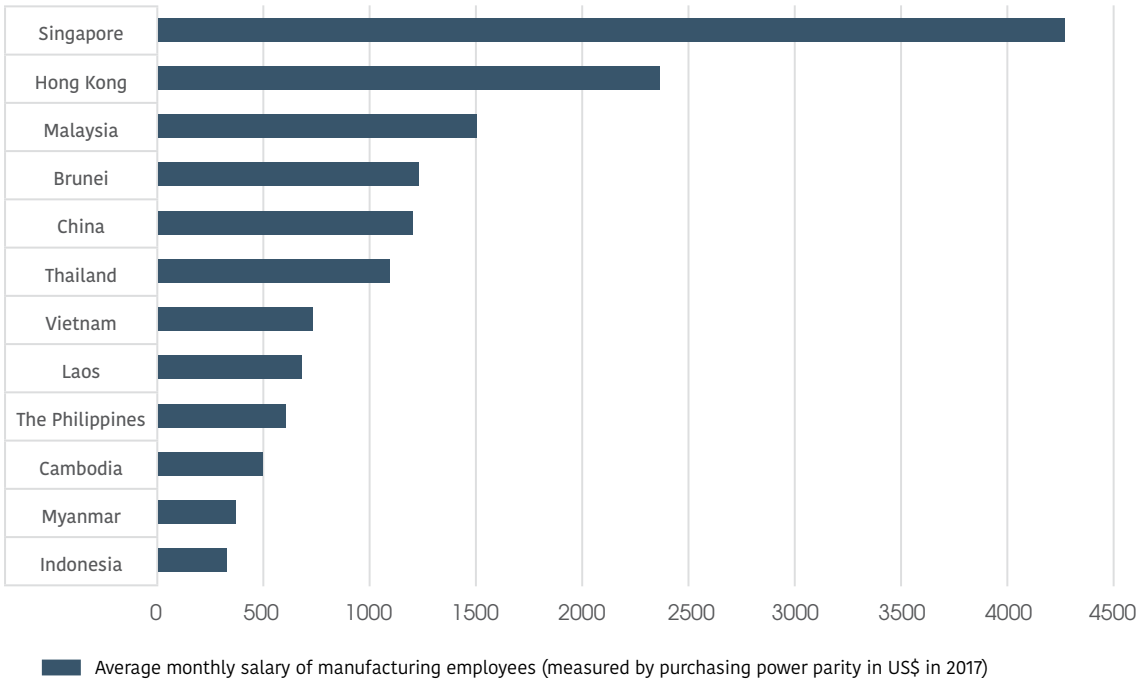


There are five main reasons for Hong Kong-invested manufacturers to choose "China+1" strategies:

1. Tariff: Hong Kong has signed free trade agreements with the Mainland and ASEAN countries, and the tariffs to ASEAN countries have dropped significantly ever since. Therefore, in the tripartite trade between the Mainland China, the US and ASEAN countries, the main consideration is the tariff between the Mainland China and the US and between ASEAN and the US. Even in the same region of Southeast Asia, economies have different tariffs or free trade arrangements with the US. If the US tariff is a major consideration for the manufacturer, the duration of the China-US trade disputes and the scope of additional tariff will affect the coping strategy. Setting up new factories overseas may not be the manufacturers' first choice if it is anticipated that the US would cancel the additional tariffs imposed on particular Chinese imports in the short term.

2. Labour cost and supply: Labour costs vary in different economies. According to the International Labour Organization's database, the average monthly salary of manufacturing workers in the ASEAN countries such as Indonesia, Myanmar, Cambodia, the Philippines, Laos and Vietnam is less than US$1,000 (measured by purchasing power parity in US$ in 2017), which is far lower than that in the Mainland and Hong Kong. **(Figure 4-2)**.

Figure 4-2 Average monthly wages of manufacturing workers in the Mainland China, Hong Kong, and the ten ASEAN countries



Source: International Labour Organization

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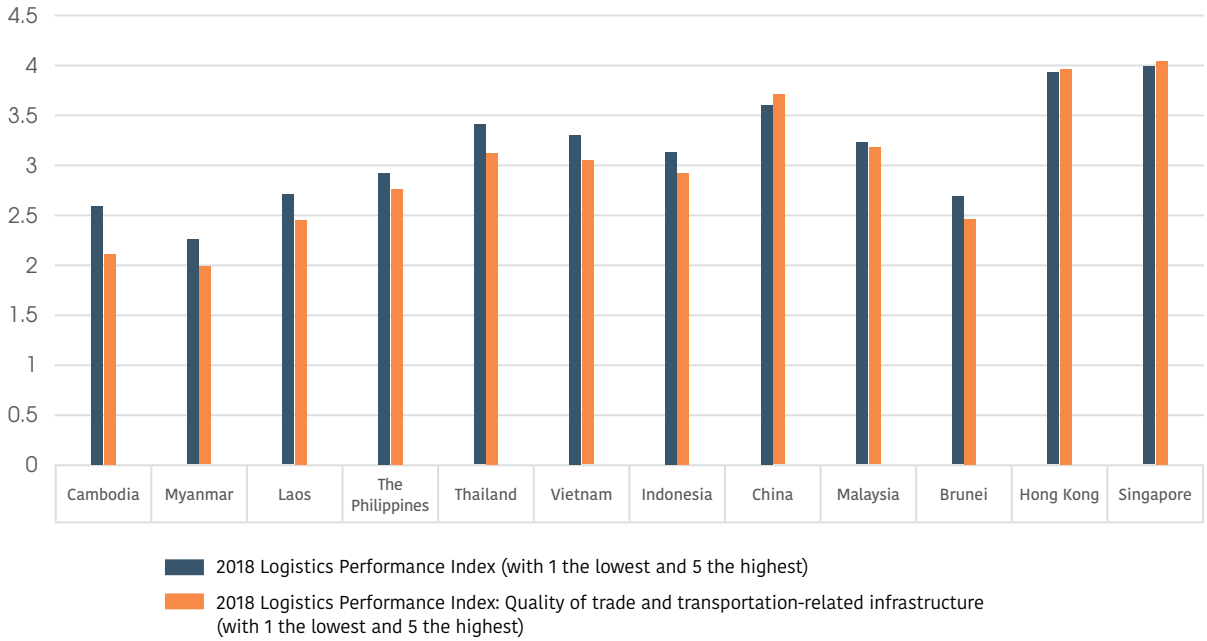
3. Logistics cost and efficiency: Southeast Asian countries is relatively close to the Mainland and Hong Kong geographically with convenient transportation means. It would be even better for Hong Kong-invested manufacturers if efficient logistics services are available to reduce the cost of purchasing raw materials and key components in the Mainland. According to the World Bank's 2018 Logistics Performance Index[47], Thailand, Vietnam, Malaysia and Indonesia have higher logistics efficiency, as well as better trade and transportation-related infrastructure. Some companies with set up in Vietnam indicated that the convenient road transport between Vietnam and Guangxi Province is able to facilitate upstream and downstream collaboration in the supply chain to reduce logistics costs. **(Figure 4-3)**

4. Flow of managerial personnel: Proximity is the main reason for enterprises to settle in Southeast Asia. The commute time from Hong Kong or the Mainland to Southeast Asia is mostly within 24 hours. It is more convenient for managerial personnel to visit the factory to supervise operation, provide technical advice and conduct staff training.

5. Local political and business environment: The destination of overseas production line and whether or not it is located in an industrial

Figure 4-3 2018 Logistics Performance Index of China, Hong Kong and ten ASEAN Countries



Source: World Bank database

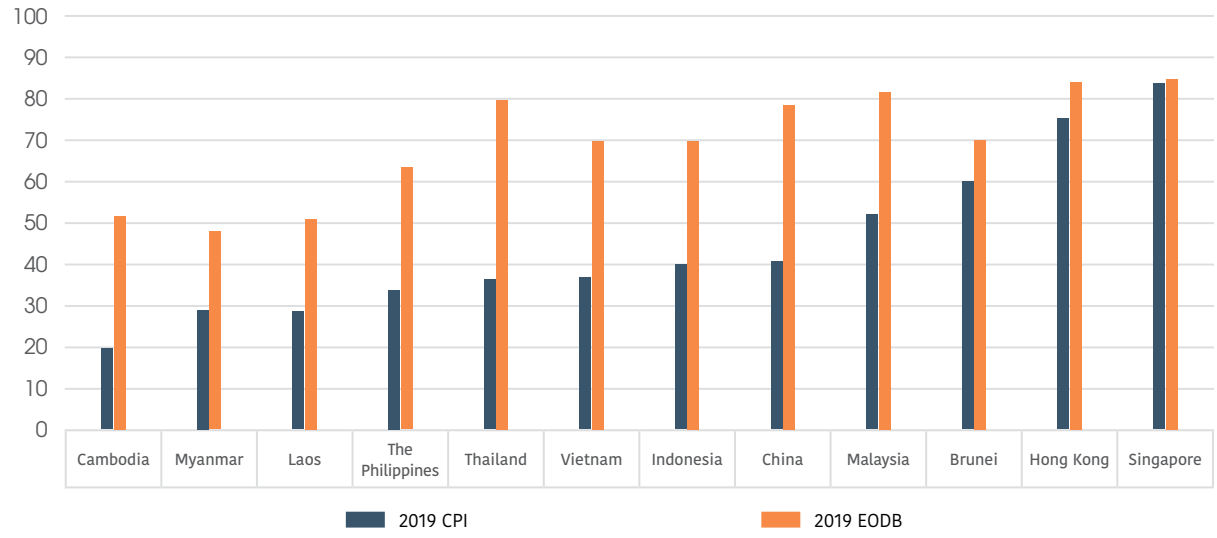
47 The total score of the Logistics Performance Index reflects one country's efficiency of logistics and customs clearance process; quality of trade and transportation-related infrastructure; facilitative arrangement of shipments with competitive prices; the quality of logistics services; the ability and frequency to keep track of the goods; and the ability to deliver shipments to the consignee at the scheduled time. The index ranges from 1 to 5 and the higher the score, the better the performance. The data comes from the Logistics Performance Index survey conducted by the World Bank in cooperation with academic institutions, international institutions, as well as private companies and individuals engaged in international logistics.

park largely depends on the local political and business environment. According to the 2019 Corruption Perceptions Index[48], Thailand, Vietnam, Malaysia and Indonesia have relatively good control on corruption, while Cambodia, Myanmar and the Philippines are the opposite. On the other hand, companies would consider to establish their factories in an industrial park due to public security issues. For example, although rents in industrial parks of the Philippines are 50% to 70% higher than those outside the parks, companies can get rid of security problems. According to World Bank's Ease of Doing Business Index[49], the business environment in Myanmar and Laos is rated as "below average", Cambodia is rated as "medium", the Philippines, Indonesia, Vietnam and Brunei are rated as "easy", and Thailand and Malaysia are rated as "very easy". **(Figure 4-4)**

In conclusion, taking into account the transportation, labour supply, political and business environment, the countries where most Hong Kong-invested manufacturers set up factories in Southeast Asia are Vietnam, Malaysia and Thailand. In the focus group, several labour-intensive textile and toy manufacturers indicated that they would choose to set up their factories in more remote towns which has access to ports, abundant supply of lower-cost labour and weaker labour unions. Although additional logistics and training costs are required, this arrangement is still relatively more cost-effective in overall.

By contrast, technology and machinery-intensive companies generally choose to set up factories in industrial parks with relatively comprehensive infrastructure support, efficient customs channels and other preferential treatments, where cost is not of primary concern.

Figure 4-4 Corruption Perceptions Index (CPI) and Ease of Doing Business Index (EODB) in China, Hong Kong and the ten ASEAN countries in 2019



Source: Transparency International and World Bank database

48 Corruption Perceptions Index is published annually by the non-governmental organisation Transparency International since 1995. The index assesses and ranks countries by their perceived levels of public sector corruption. The higher score indicates a lower level of corruption as perceived by the public.

49 The Ease of Doing Business Index reflects the status of a country's business environment in the scale from 0 to 100. The higher the score, the more favorable the regulatory environment is for business operations. This score is the average of the scores of ten topics covered by the World Bank's "Doing Business" report.

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4.1.4 Challenges in adopting "China+1" strategy

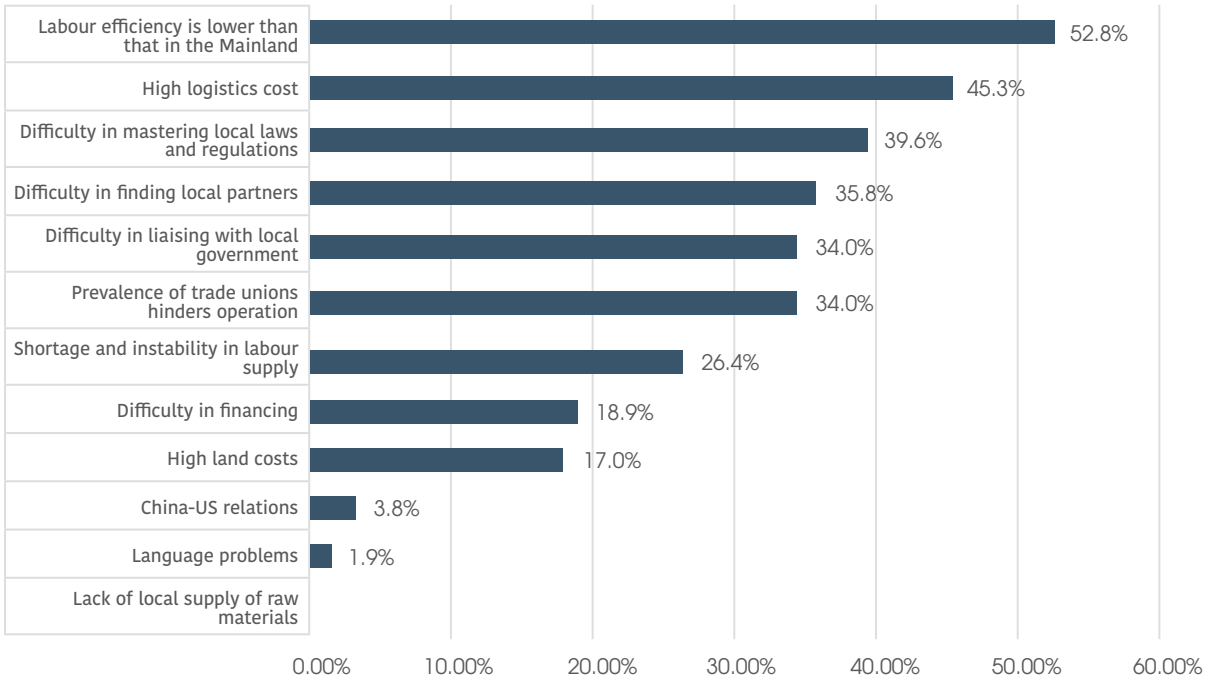
1. International political dynamic and economic environment have increased uncertainty:
The diplomatic relations among Southeast Asian countries, the Mainland China and the US are constantly changing. Manufacturers are exposed to the risk of additional tariff anytime due to political dynamics. For example, in October 2020, the US initiated Section 301 Investigation of Vietnam's policies on timber supply and currency exchange. Such actions may result in punitive tariffs on imports from Vietnam and manufacturers would not be able to avoid tariff costs by setting up at Vietnam.

2. Hong Kong-invested manufacturers have difficulties in labour, logistics, compliance, financing and land supply (Figure 4-5):

- 52.8% of respondents believed that the labour efficiency of Southeast Asian countries is lower than that of the Mainland, and 26.4% of respondents have problems with labour shortages and instability in their overseas factories. Respondents in the focus group indicated that among Southeast Asian countries, only in Thailand the labour efficiency is comparable to that of the Mainland. Compared to the Mainland, workers in Indonesia is about 80% as efficient; and workers in the Philippines and Vietnam is only about 60% to 70% as efficient.

- 45.3% of respondents believed that high logistics cost is a main challenge to set up factories overseas. A few enterprises indicated

Figure 4-5 Challenges faced by respondents adopting "China+1" strategy



that the lack of local supply of raw materials, auxiliary materials and equipment in Southeast Asia affects product delivery time line. Since customers usually have certain requirements for the quality of raw materials, even if Hong Kong-invested manufacturers move their production lines to Southeast Asian countries, the source of raw materials, key components and parts is still in the Mainland China. Logistics cost surges as a result.

- 18.9% and 17% of respondents indicated that financing difficulties and high land prices impede them from setting up factories in Southeast Asia.

- Political, economic and cultural differences in Southeast Asian countries could be challenging for Hong Kong-invested manufacturers. Nearly 40% of respondents think it is difficult to clearly understand local laws and regulations; 34% think it is difficult to communicate with the local government; 34% indicate that the prevailing trade unions hinders operation; and 35.8% suggest that it is difficult to find a local business partner in Southeast Asia.

- The internal political instability in Southeast Asian countries has increased the operational risks of Hong Kong-invested manufacturers with factories there. For example, the political unrest in Myanmar in early 2021 led to non-cooperative movement of local civil servants and private sector employees. Only 25% of the customs officers showed up at work and many containers were delayed for customs clearance. Workers were unable to attend work as usual, making the factories unable to maintain normal operation.

4.2 Strategy 2: "Business Repositioning"

As huge capital and management resources is required to set up factories overseas, most of the Hong Kong-invested manufacturers adopting "China+1" strategy are enterprises above designated size, according to the survey results. It is relatively difficult for SMEs to adopt the same approach. Most SMEs look at business repositioning in coping with business challenges, including adjusting business models and reviewing target markets .

There are two aspects of business repositioning: the first is to reposition businesses strategy to engage in the upstream and downstream of the production chain, extending the original focus on the production process to the development of producer services with higher added value and more diversity in the production value chain. The second is to reset the geographical market focus along the eastward shift of the world's economy.

4.2.1 Repositioning of business strategy

1. Integration of upstream and downstream of the industrial chain: Modern manufacturing is no longer limited to the assembly processes in the workshop, but also covers the early-stage processes like R&D of products and manufacturing technology; middle-stage processes such as design of production workflow and innovation in production management system; as well as the later-stage of brand building, targeted marketing and offering consultancy to customers on production plans and supply chain management. In the focus group, Hong Kong-invested manufacturers indicated that upon customers' demands, his company has extended the business scope from manufacturing services to providing product design and R&D services, as well as other high-tech producer services.

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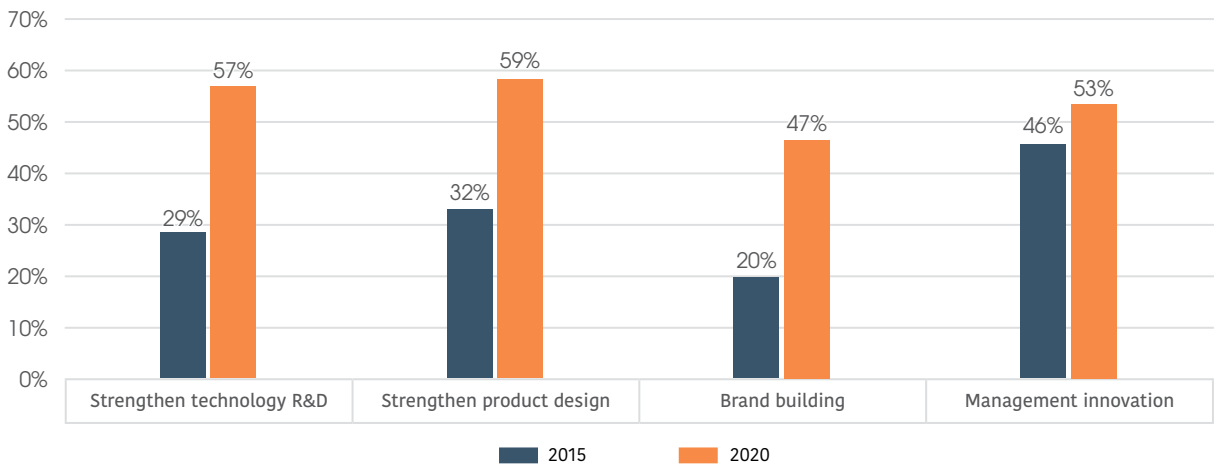
2. Harnessing management innovation: According to the *Made in PRD 2015 Study – Hong Kong Industries: The Way Forward* published by FHKI in 2015, 46% of Hong Kong-invested manufacturers take "management innovation" as their main business strategy; whereas 53% of respondents adopt the same strategy in the current study. This is directly related to Hong Kong's manufacturing characteristics, service model and industrial supply chain system, while also reflecting that Hong Kong-invested manufacturers mostly use internal innovation to manage costs.

3. Shifting of business strategy: As shown in **Figure 4-6**, Hong Kong-invested manufacturers are now more inclined to "strengthen technology R&D" (57%) and "strengthen product design" (59%) than before. Compared with the survey results in 2015, the ratio of Hong Kong-invested manufacturers adopting these two business strategies has doubled, surpassing the ratio of those adopting "management innovation". It shows that most of the respondents have a tendency to extend to the upstream of the production chain, leading to a surging demand for talents in technology R&D and product design.

4. Brand building: Most of the time, multinational companies have been unwilling to see their manufacturing service providers build their own brands and become their market competitors. Therefore, in the early years, Hong Kong-invested manufacturers were not interested in brand building which may risk them losing orders from their sizable clients. In 2015, the survey results showed that only 20% of the respondents would try to build original brands. But nowadays, nearly half (47%) of the respondents are interested in brand building, including the creation of original brands and the establishment of brands through mergers and acquisitions. This reflects that Hong Kong-invested manufacturers have accelerated their transition from the earlier OEM and ODM models to become the original brand manufacturer (OBM), moving towards the rear end of the production chain. In recent years, the Hong Kong Government and the Mainland government have introduced relevant policies and support measures to encourage the industry to upgrade and transform, which may also be a driver for enterprises to pursue more actively on this aspect.

Figure 4-6 Changes in business strategies adopted by Hong Kong-invested manufacturers



5. Tapping into producer services for Industry 4.0: At present, advanced industrial countries or regions have entered the era of Industry 4.0. In the future, manufacturers are required to provide customers with high value-added producer services. In addition to the assembly process in the workshop, manufacturers also need to "reposition" themselves to provide production-related technical services to their clients. For example, manufacturers who used to produce environment engineering machinery may now extend their business to providing design and management services to optimise the production management system for customers, with a view to build up a just-in-time production chain to reduce customers' cost for inventory.

6. Customised production in small batches: The shifting from large-scale mass production to small-batch customised production is another option for manufacturers to "reposition" their businesses. Manufacturers can now predict product demands by big data analysis and purchase the right amount of materials for production. Through B2C business channels, manufacturers can produce small batches of customised products to meet the expectation of current day consumers.

4.2.2 Repositioning of the sales market

As the global economic focus shifts to Asia, China-US trade dispute and COVID-19 outbreak, the Mainland China have been dedicated to support domestic sales of goods originally intended for export, which indicated that sales market repositioning is a possible strategy for Hong Kong-invested manufacturers.

1. Hong Kong-invested manufacturers to take part in "internal circulation" of the Mainland: During the Two Sessions on 23rd May 2020, President Xi Jinping officially brought up the "internal circulation" economic strategy for the first time. With the domestic circulation as the main body, this concept brings the strong domestic demand into full play to resist the external economic impacts, which helps manufacturers reduce uncertainty and maintain a stable capital flow. In particular, Hong Kong-invested manufacturers should focus on cities in the Greater Bay Area adjacent to Hong Kong. Shenzhen, Guangzhou, Foshan and Dongguan, where Hong Kong-invested manufacturers gather, are among the top 30 cities in the Mainland in terms of per capita GDP in 2019[50]. Of which, Shenzhen tops the rank with a per capita GDP of RMB 203,489. These cities have strong disposable income and are the best choices for Hong Kong-invested manufacturers to tap into the domestic market.

50 In 2019, one-fifth of the top thirty cities in China's GDP ranking are in Jiangsu (Hong Kong Netease Interactive Entertainment Limited, 6th March 2020). https://www.163.com/dy/article/F70RTKNA05199GUB.html

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2. Resilience of China's domestic market: The traditional markets and main trading partners of Hong Kong-invested manufacturers are in Europe and the US. During the focus group, Hong Kong-invested manufacturers indicated that due to COVID-19 and the China-US trade dispute, orders for exports to Europe and the US have dropped significantly. Likewise, the questionnaire survey results also indicated that traditional export-oriented manufacturers are facing greater difficulties in the current international market environment. On the contrary, for respondents that mainly engaged in the Mainland market, 56% of them saw their sales remained unchanged or even increased; while 44% saw their sales decreased. For respondents that mainly engaged in the European and American markets, 26% of the sales remained unchanged or increased, while 74% decreased. It can be seen that the Mainland market has strong resilience against external shocks, and increasing participation in the domestic market will help improve the stability of product sales of Hong Kong-invested manufacturers. **(Table 4-4)**

3. Maintain traditional overseas market: While exploring the Mainland market, Hong Kong-invested manufacturers can take advantage of the stable production environment in the Mainland to maintain the existing traditional overseas markets in parallel to opening up new markets. According to statistics from the General Administration of Customs in November 2020, China's exports increased by 21.1% year-on-year, setting a record for the highest growth rate ever since February 2018. Over the years, the foundation built by Hong Kong-invested manufacturers in the international market can play a stabilising role in the ever-changing situation.

4. Trade diversion triggered by the China-US trade dispute: In November 2019, the United Nations Conference on Trade and Development published an article on the impact of trade and trade diversion caused by the additional tariffs imposed by the US on China's imports[51]. It turns out that trade diversion to Southeast Asia, Mexico, the European Union and Canada has brought in revenues of US$1.2 billion to

Table 4-4 Relationship between market location and changes in sales (%)

Market location	Unchanged	Increased	Decreased
Mainly in the Mainland	30.8%	25.6%	43.6%
Mainly in Europe and the US	12.2%	13.3%	74.4%

51 Nicita, Alessandro, Trade Analysis Branch, Division on International Trade and Commodities, United Nations Conference on Trade and Development, November 2019, Trade and Trade Diversion Effects of United States Tariffs on China.

US$4.3 billion[52], with the trade in Southeast Asia growing the most. As the China-US trade dispute continues, the trend of trade diversion is likely to escalate. Coupled with the signing of RCEP, it will bring various trade facilitations across the ten ASEAN countries, China, Japan and South Korea to stimulate the overall trade volume.

On the other hand, the respondents in the focus group pointed out that since the US has restricted the export of some products to China, some key imported technologies, raw materials and ancillary components used by Hong Kong-invested manufacturers have been affected, causing production delays or even suspensions. Therefore, many Hong Kong-invested manufacturers not only intend to increase their sales share in the ASEAN market, but also increase their procurement in the Mainland China, Japan and South Korea.

4.2.3 Market diversion strategies adopted by Hong Kong-invested manufacturers

1. Shifting market focus: In response to the China-US trade dispute, 59% of respondents targeting the Mainland market would expand domestic market with the support of dual circulation economic strategy; 33% would increase the share of domestic sales and expand the production line; 35.9% would expand the ASEAN market. Even for enterprises targeting the traditional European and American markets, 51.1% would expand the domestic market, 28.9% would increase their share of domestic sales and expand the ASEAN market. There is an obvious trend for enterprises to shift from the traditional European and American markets to the domestic and the ASEAN market. **(Table 4-5)**

Table 4-5 Relationship between the location of the enterprises main market and the shift of the centre of gravity

Shifting market focus	Companies targeting Mainland market	Companies targeting Europe and the US market
Expand the domestic market in Mainland with the support of dual circulation economic strategy	58.97%	51.11%
Shift market focus from Europe and US to the Mainland and Southeast Asia	20.51%	28.89%
Increase the share of domestic sales and expand production lines in the Mainland	33.33%	28.89%
Expand the ASEAN market	35.90%	28.89%

52 Since there were no official data at the time of the study, the analysis of the article did not cover the products involved in the final stage of the trade war (that is, the fourth list published by the United States after September 2019).

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2. Entering the Mainland market via GBA: The strong economic foundation of GBA and the consumption power in the region cannot be overlooked. In 2019, the per capita GDP in GBA reached RMB 161,500 and the total retail sales of consumer goods exceeded RMB 4 trillion for the first time. This huge consumer market provides enormous room for Hong Kong-invested manufacturers. The municipal governments in the GBA also intend to create a high-quality consumption market by introducing policies to release consumption potential[53] and encourage local governments to issue cash vouchers and electronic consumer vouchers to stimulate public consumption and promote retail sales. Therefore, many Hong Kong-invested manufacturers take GBA as a gateway for their products to enter the domestic market. The results of the questionnaire survey showed that 115 of the 225 respondents (51%) would expand the Mainland market. Among them, 60% expect that their business will grow by 0-20%, and about 15% of the respondents expect the market to grow by more than 50%. **(Figure 4-7)**

3. Expand the ASEAN market: Among the 62 respondents that plan to explore the ASEAN market, 73% of them believe that the company's growth rate in the ASEAN market is between 0-20%, and 3% believe that the growth rate is above 50% **(Figure 4-8)**. The intention of manufacturers to expand the ASEAN market is very likely to be related to whether they have already set up factories in ASEAN or have plans to set up factories there.

Figure 4-7 Expected growth of the Mainland market

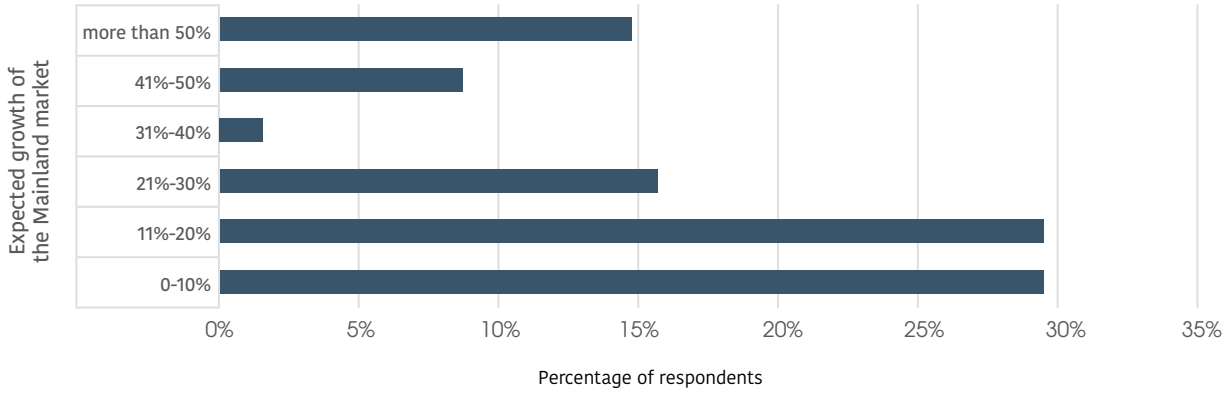
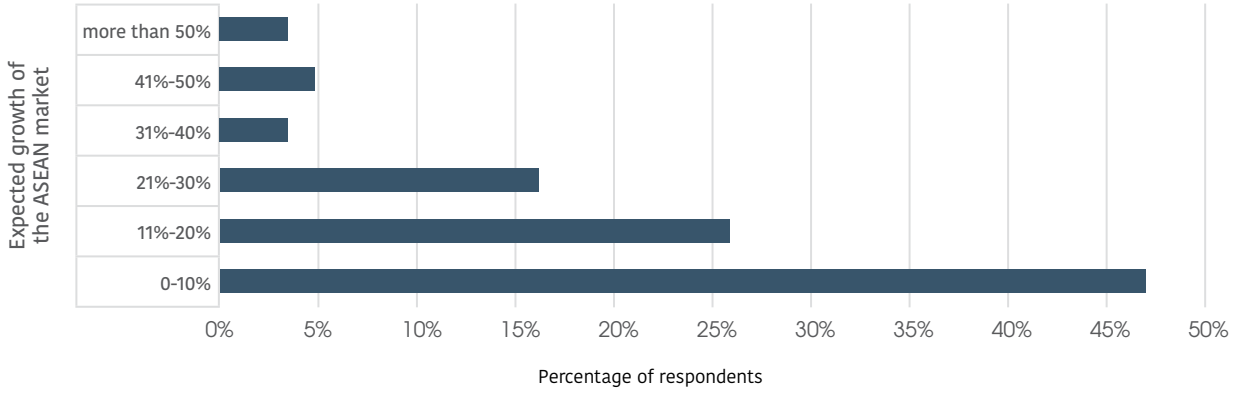


Figure 4-8 Expected growth of the ASEAN market



53 The "Guangzhou's Measures to Boost Consumption and Promote Market Prosperity" and "Shenzhen's Measures to Further Stimulate Consumption Vitality and Promote Consumption Growth" were announced in 2020.

4.2.4 Challenges in shifting or expanding markets

1. Invisible trade barriers in the ASEAN market: Although many Hong Kong-invested manufacturers have set up factories in ASEAN countries, gaining access to the local market remains a challenge. Cultural differences, language and local protectionism are some of the common barriers encountered. Respondents in the focus group stated that local governments set up "invisible" trade barriers to protect local businesses. For example, in countries like Indonesia and India where the product testing standards are ambiguous, local customs may detain the goods of foreign toy manufacturers on the grounds that they do not meet the testing standards. Other than that, since countries such as Bangladesh and Vietnam have policies that favour domestic SMEs, Hong Kong-invested manufacturers must establish joint ventures with local companies to set up factories or invest in the country. With the implementation of RCEP, it is expected that trade barriers will gradually diminish to improve business and investment environment in ASEAN countries, thereby allowing Hong Kong to develop closer business cooperation with partners there.

2. Difficulties in turning export products to domestic sales: Respondents indicated the following difficulties in supporting domestic sales of goods originally produced for export in the Mainland:

- Domestic sales usually adopt the sales on credit model. Hong Kong-invested manufacturers often encounter difficulties in collecting payments, weakening their liquidity and bringing risks to their financial performance. Respondents indicated that they intend to cooperate with relatively credible regional governments or enterprises when they expand domestics sales in order to ensure the payments can be recovered.

- The cost of China Compulsory Certification ("3C") for each type of product in the Mainland varies. Some respondents indicated that the cost of applying for 3C licenses for certain products in the Mainland is high, for instance, products involving 4G or 5G technology applications can cost RMB 500,000 to 1 million license fee. If Hong Kong-invested manufacturers are not sure about the market size before entering the Mainland market, or if they want to test the market with small batch production, expensive license fee could be a major obstacle for market access.

- The Mainland market are different from the European and US markets a lot in terms of product specification, consumer preferences and their pursuit of consumption experience. Hong Kong-invested manufacturers must adjust and modify their products for the Mainland market.

- Since many Hong Kong-invested manufacturers have less marketing experience and dedicated local teams, their brands are not well-recognised in the Mainland. Respondents shared that the use of internet celebrities for sales in the Mainland is a very popular and effective brand-building and targeted marketing strategy. At the same time, businesses have to adopt cross-border e-commerce platform in the Mainland and make use of online shopping seasons to build extensive online sales channels. Hong Kong-invested manufacturers must master these new channels to gain access to the domestic market.

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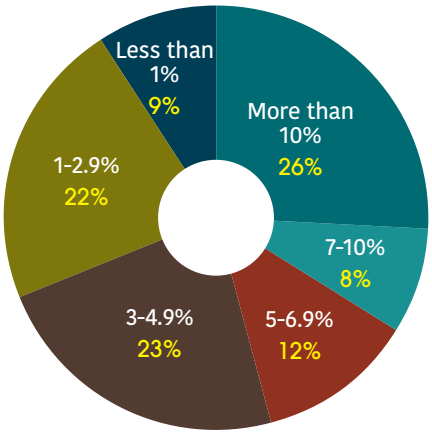
4.3 Strategy 3: "Upgrade and Transformation"

4.3.1 Investment in R&D

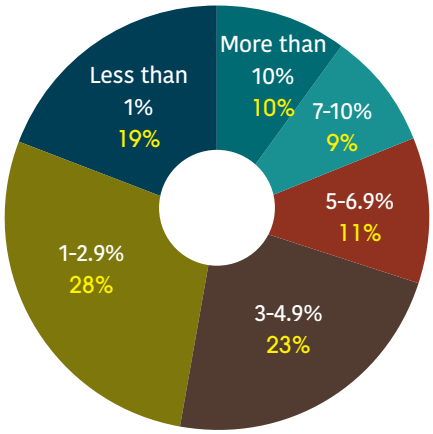
The resources invested by Hong Kong-invested manufacturers in R&D activities and product R&D have increased significantly. In 2020, 26% of respondents indicated that they would spend more than 10% of the turnover on product R&D, which is much higher than that in 2015 where only about 10% would invest the same level of resources for this purpose. Among all the respondents in 2015, only about 30% would invest more than 5% of turnover for R&D; this proportion has increased to 46% in 2020. Despite the China-US trade dispute and COVID-19 pandemic, Hong Kong-invested manufacturers are still keen to invest in product R&D. Only 7% of respondents said they would reduce investment in product R&D, while more than half (53%) said they would increase the investment. It can be seen that R&D innovation is the business strategy of many companies in the face of adversity. **(Figure 4-9)**

Figure 4-9 Hong Kong-invested manufacturers continue to invest in R&D

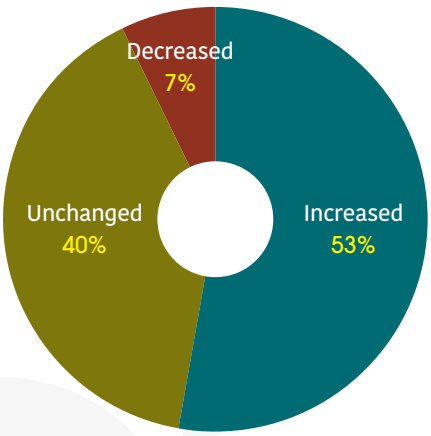
The ratio of product R&D investment to revenue in 2020



The ratio of product R&D investment to revenue in 2015



Changes in Hong Kong-invested manufacturers'product R&D investment to revenue



4.3.2 R&D locations of Hong Kong-invested manufacturers

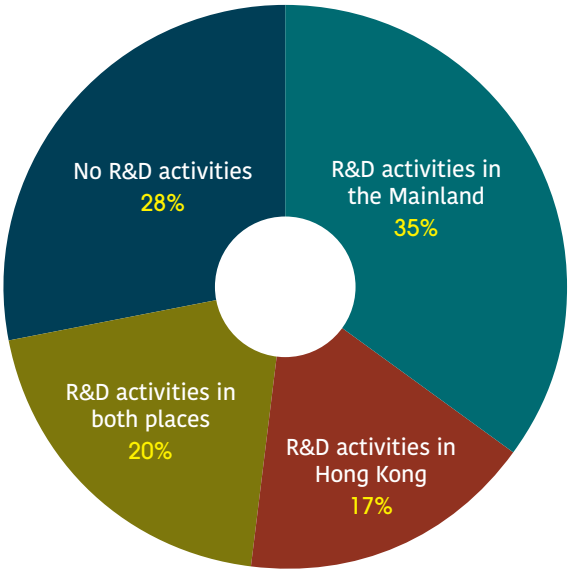
According to the results of questionnaire survey, 35% of respondents stated that their R&D activities were mainly carried out in the Mainland, 17% stated that their R&D activities were all carried out in Hong Kong, and 20% had R&D activities in both places, reflecting the division of labour between the two places in terms of technology research and exchange. **(Figure 4-10)**.

The respondents in focus group said that the Mainland has better R&D support than Hong Kong. The main reasons for setting up R&D department in the Mainland include:

- The supply of suitable engineers in the Mainland is stable with comparatively low wages;
- The production chain and supply chain in the Mainland are relatively comprehensive with sufficient supply of key components and parts for R&D;
- The R&D team is located close to the production lines to facilitate communication and foster efficiency; and
- The Mainland has a comparative advantage in attracting R&D capital.

Nevertheless, Hong Kong has essential qualities to strengthen its role as an R&D centre in the GBA. In 2019, the Intellectual Property Department of Hong Kong introduced the Original Grant Patent (OGP) System to open up a direct path for patent applicants, which is in line with the mainstream patent system practices in the international community. In addition, Hong Kong has a sound regulatory system, providing it with a great advantage in becoming a research centre in the GBA.

Figure 4-10 Distribution of the R&D locations of respondents



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4.3.3 The industrial phase of Hong Kong-invested manufacturers

At present, most of the Hong Kong-invested manufacturers responding to the questionnaire survey are adopting hybrid of traditional and automated production (65%), and only about 13% of them are in the automated production and industrial IoT phase. It is estimated that most Hong Kong-invested manufacturers are between Industry 2.0 and Industry 3.0 phase. The survey results reflect that although most of the factories of Hong Kong-invested manufacturers have mechanical automation equipment to replace part of the labour force and improve efficiency, they have not yet reached Industry 4.0 in terms of intelligent production with fully integrated human-machine communication and M2M communication. **Table 4-6** shows that among respondents in more advanced industrial production stage, the larger proportion of them achieve higher annual sales.

4.3.4 Relationship between transformation strategies and innovation

The UK National Endowment for Science, Technology and the Arts ("NESTA") published a report that categorises innovation into "hard innovation" and "soft innovation". "Hard innovation" includes the improvement in technical aspects and craftmanship of products and processes, which mainly relies on technological R&D that requires relatively more tangible capital. "Soft innovation" encompasses all non-functional innovations, mainly based on aesthetics and intangible capital innovations (such as marketing, management innovation and branding) that require less financial investment.

Table 4-6 Relationship between the industrial phase of major factories and annual sales (%)

The industrial phase of major factories	Less than $50 million	$50 to 99.99 million	$100 to 999.9 million	More than $1 billion
Traditional production	52.0	30.0	14.0	4.0
Hybrid of traditional and automated production	24.1	16.6	42.1	17.2
Industrial IoT or automated production	16.7	13.3	46.7	23.3

Table 4-7 and **Table 4-8** are cross-analysis to show that manufacturers at different industrial phases and sizes tend to engage in different types of innovations, and that large-scale enterprises and SMEs have different needs in upgrading and transformation. The more advanced industrial phase of an enterprise or the higher the annual sales, the larger the proportion of enterprises adopting hard innovation (that is, technology R&D and application of technology in management innovation). Enterprises in less advanced industrial phases and lower annual sales tend to pursue soft innovation (such as product design and brand building).

Table 4-7 Relationship between the industrial phase of major factories and innovation strategy (%)[54 55]

The industrial phase of major factories	Strengthen technology R&D	Strengthen product design	Management innovation	Brand building
Traditional production	28.0	68.0	40.0	52.0
Hybrid of traditional and automated production	64.1	60.7	60.0	46.9
Industrial IoT or automated production	76.7	36.7	50.0	40.0

Table 4-8 Relationship between total annual sales and innovation strategy (%)

Total annual sales	Strengthen technology R&D	Strengthen product design	Management innovation	Brand building
Less than $50 million	41.4	65.7	38.6	54.3
$50 to 99.99 million	48.8	53.5	58.1	51.2
$100 to 999.9 million	64.3	60.7	53.6	40.5
More than $1 billion	82.4	50.0	76.5	44.1

54 Only 225 of the total 231 respondents indicated the stage of the development of the major factories, the percentages in the table is calculated based on this group of 225 respondents.
55 These four upgrade and transformation strategies are multiple choices in the questionnaire survey.

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4.3.5 Challenges in upgrade and transformation

According to the results of questionnaire survey, 41% and 58% of the respondents encountered difficulties in hiring suitable professionals in the Mainland or Hong Kong, which is higher than other constraints. Besides, focus group respondents indicated that the cross-sector collaboration in Hong Kong is not sufficient enough to strengthen the manufacturers' R&D capabilities. **(Figure 4-11)**

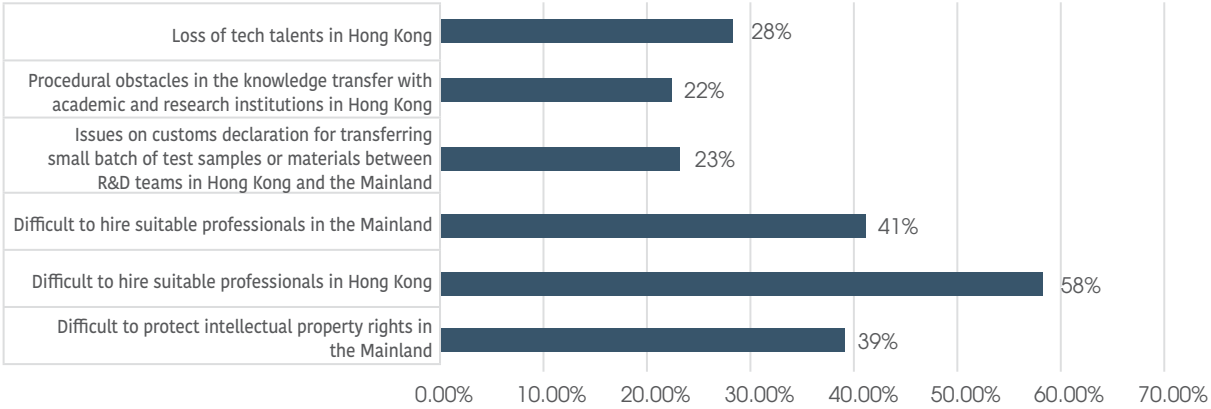
The internal R&D and industrial transformation efficiency of Hong Kong-invested manufacturers are not only restricted by the business scale and level of automation of the enterprise. Respondents pointed out some more specific challenges during the focus group interview:

1. Difficulties in recruiting R&D talents: The cost of recruiting R&D talents in Hong Kong is higher than that in the Mainland and turnover rate is also higher. As Hong Kong is short of locally-trained R&D talents, companies often need to recruit personnel from the Mainland or overseas. The recruitment and training costs are high and companies face fierce international competition in R&D manpower. The turnover rate of R&D talents in Hong Kong is high, where employees usually move to top-tier overseas or Mainland cities for better career opportunities after working in the company for only two to three years. Therefore, it is more cost-effective to recruit in the Mainland and conduct R&D there.

2. Lack of cross-sector R&D collaboration in Hong Kong: Although Hong Kong's academia have excellent scientific R&D capacities and talents, it's challenging for Hong Kong-invested manufacturers to come into R&D collaboration with academic institutions:

- Universities are more inclined to basic research with less consideration on whether the research outcomes contain industrial or market value. Hong Kong-invested manufacturers need to invest a lot of resources in mid-and downstream product development even after they identify R&D projects that are suitable for commercialisation;

Figure 4-11 Challenges faced by respondents in upgrade and transformation



- R&D projects in the university usually takes two to three years to complete, which can hardly match with the product development cycle of only six to twelve months in commercial set-ups;

- In general, the performance evaluation mechanism in universities is not inclined to "applied research" and "technology/ knowledge transfer", which makes researchers less motivated to pursue research topics that are more practical and have the potential for industrialisation. Although the University Grants Committee ("UGC") included new elements about the social impact of research in the Research Assessment Exercise in 2020, there isn't yet specific weighting for "basic research", "academic impact", "commercialised product research" and "impact to society". The effectiveness of the UGC's new assessment guidelines on strengthening the collaboration between industry and academia remains to be seen.

3. Obstacles in the customs declaration for small batches of research samples/ materials: Respondents pointed out that there is currently no specialised company or organisation to handle the customs declaration for small batches of scientific research samples and material, neither does the government have facilitative customs clearance policy for cross-border R&D collaboration. R&D progress is obstructed as it is time-consuming and costly for R&D units across the border to arrange logistics for samples and test materials.

4. Patent rights and intellectual property protection in the Mainland: Respondents indicated that the patent protection to enterprises is unclear in the Mainland. There's possibility of R&D employees taking away the patents they obtained at work after resignation. In addition, although the Mainland's R&D capabilities are stronger than those of Hong Kong and the time required is shorter, companies usually lack sufficient support in background research when they apply for patent protection in Europe that eventually impair the protection of intellectual property rights of enterprises. Therefore, it is an urgent matter for the governments in Hong Kong and the Mainland to figure out how to promote cooperative R&D in a reasonable and efficient manner with due consideration on the strengths and weaknesses on the two sides.

4.4 Strategy 4: "Establishing Production Lines in Hong Kong"

4.4.1 Setting up production lines in Hong Kong

The cost advantage of setting up factories in the Mainland has gradually diminished as operating costs there have continued to increase in recent years. On the other hand, the Hong Kong Government has enhanced its policies and subsidies to attract high value-added manufacturing industries to Hong Kong, with the "Re-industrialisation Funding Scheme (RFS)" launched to help traditional Hong Kong manufacturers establish automated and intelligent production lines. As a result, Hong Kong-invested manufacturers have been actively considering setting up part of their production lines in locally. According to the questionnaire survey, of all the respondents, 61 (26.8%) stated that they have already set up production lines in Hong Kong, while 24 (approximately 10%) indicate that they have the intention to relocate back to Hong Kong.

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4.4.2 Features of manufacturers with production lines in Hong Kong

1. Mainland as the main market: Among the 61 respondents that have set up factories in Hong Kong, 43.6% are only targeting the Mainland market, while 26.7% are only targeting the European and American markets.

2. Factories are in more advanced industrial phase with R&D innovation: 44.4% and 33.3% of manufacturers whose main factories are in the industrial IoT stage and the automated production stage respectively have moved or intend to move their factories back to Hong Kong, whereas 34% of manufacturers whose main factories are in the traditional production also adopt this strategy. The enterprises that are least inclined to move their production lines back to Hong Kong are those in the hybrid of traditional and automated production.

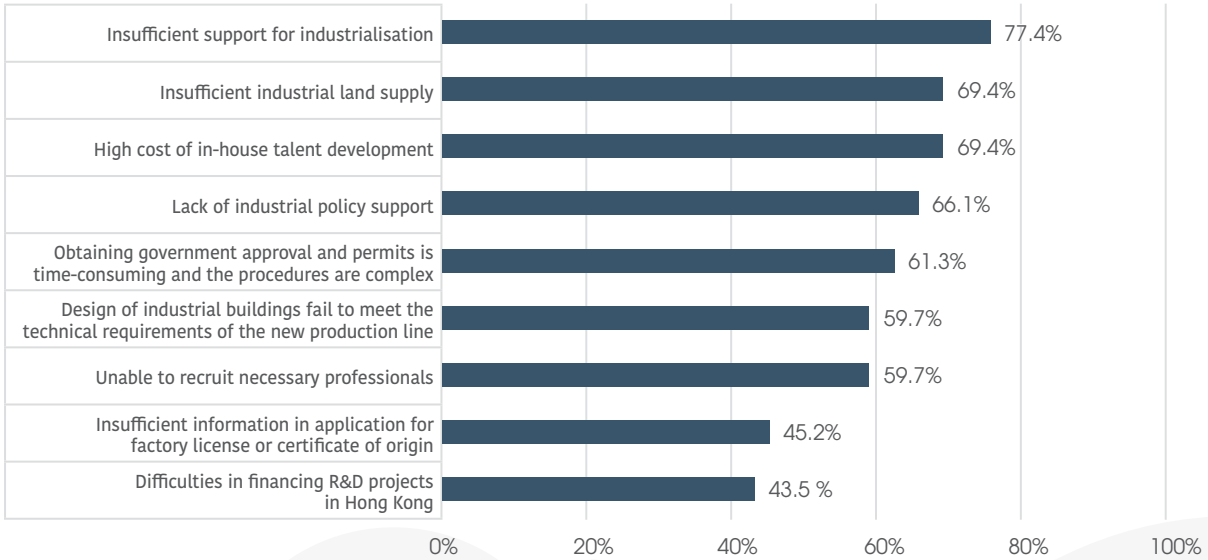
3. Those who are engaging in food, plastics and environmental industries are more willing to move their factories back to Hong Kong, while those who manufacture moulds, electronics and optical products, metal products and machinery are less willing to do so.

4.4.3 Challenges in setting up production lines in Hong Kong

Due to the small scale of local manufacturers and limited industrial sectors, it is difficult to form economies of scale in the short term and Hong Kong-invested manufacturers face various challenges in setting up productions in Hong Kong. **(Figure 4-12)** Of all the respondents, 77.4% believe that the lack of support for industrialisation is a major challenge for them to pursue advanced and high value-added production in Hong Kong. For example, the production chain of toy manufacturing involves a large number and a wide variety of production processes, and it is necessary to have upstream and downstream manufacturers to form a comprehensive industrial value chain. Therefore, it is very unlikely for toy manufacturers to move the whole or part of the production line back to Hong Kong.

In addition, insufficient third-party producer services is another common problem. According to the questionnaire survey, respondents pointed out that automated production systems (77.4%), industrial design and

Figure 4-12 Challenges faced by respondents in moving their production lines back to Hong Kong



product development (71%), advanced product testing and certification (69.4%), technical training (54.8%), and centralised logistics and warehouse services (46.8%) are essential to their development. Although these third-party producer services require a huge amount of investment, they are essential support to high value-added manufacturing. Government policy support is required to enhance the producer services provision in support of advanced manufacturing development.

In terms of land, 69.4% and 59.7% of respondents believe that industrial land is insufficient and the design of factory buildings fails to meet the technical requirements of advanced production lines respectively, restricting them from relocating production lines back to Hong Kong. For example, the production of heavy machinery requires a large area of flat land, which the supply in Hong Kong is scarce. Food companies pointed out that the small factory size in Hong Kong makes it difficult to introduce large-scale automated machinery. In addition, local SME food manufacturers produce a wide variety of food items, which are not cost-efficient to produce with machines. If the factory is close to a residential area, it is difficult to carry out the three-shift system because of potential nuisance to the neighbourhood, resulting in low production efficiency.

The lack of industrial talents constitutes the biggest obstacle for respondents to relocate back to Hong Kong. The following points were raised in the focus group:

- Insufficient technicians to support specific manufacturing operations in Hong Kong: 59.7% of respondents find it difficult to recruit the necessary technical professionals in Hong Kong. An automobile parts manufacturer indicated that Hong Kong lacks the required professional technicians; even if the R&D centre is moved to Hong Kong from Shenzhen, the production process still have to be conducted in the Mainland factories or by outsourced service providers. For some traditional textile and apparel manufacturers with certain degree of automated production, it is difficult to hire the required data analysts, programmers and colour management technicians in Hong Kong. Traditional food manufacturers also said that the supply of food processing technicians is not enough.

- Relatively high labour and training costs in Hong Kong: According to the Census and Statistics Department, the median monthly employment earnings of employed persons in the second quarter of 2020 (excluding foreign domestic helpers) is HK$19,000, which is far higher than the average wage level in the Mainland. Even in the neighbouring Shenzhen, the average monthly salary in 2020 is RMB 7,621. Out of all respondents in the questionnaire survey, 69.4% believe that the cost of in-house talent training is too high and not affordable by SMEs.

- Insufficient supply of local graduates: For many years, the public has generally underestimated the importance of STEM subjects (science, technology, engineering, and mathematics). Not many students choose to study these subjects and devote themselves to the manufacturing sector, and the relevant curriculum does not meet the needs of modern industry. An environmental industry manufacturers said that specialised training programs are available in Germany, Japan, and Taiwan across various fields from environmental product design, production line design, recyclable material R&D to waste-to-energy conversion etc. to ensure continuous supply of technical talents

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- Difficulties in retaining local talents: Due to the small scale of the local manufacturing sector, technical may find the career development prospects in Hong Kong limited and choose to develop outside Hong Kong or change careers. Long term talent retention remains a challenge even if institutions and manufacturers invest in training technical workers.

- High entrance requirement for overseas industrial talents: The current "Research Talent Hub" programme or "Technology Talent Admission Scheme" generally requires applicants to hold a university degree. However, many veteran industrial professionals from the Mainland only have associate degrees or vocational degrees, or even work experience only. The current policies do not favour local manufacturers to recruit suitable experienced industrial talents from abroad.

Respondents also have an impression that the re-industrialisation policy in Hong Kong is fragmented. They expressed the need for more aligned industrial policies and the government shall take more active approach to encourage local industrial development. They put forward the following points:

- Insufficient industrial policy support: Of all the respondents, 66.1% believe that Hong Kong lacks industrial development policies and support. For example, a food manufacturer pointed out that the lack of market information on solutions and production technology hinders upgrade and transformation; manufacturers spend more effort and get fewer results in their development.

- The government should strongly support private companies in R&D: Of all the respondents, 43.5% find it difficult to finance R&D projects in Hong Kong. Due to the large investment, high risks and externalities (such as technology may be plagiarised by other companies), private companies generally have little initiative to conduct R&D without policy incentives, such as subsidies on fund, recruitment and land supply. It also hinders the high value-added development of the manufacturing sector.

- Complicated government approval procedures: 61.3% of respondents are concerned of the complex and lengthy procedure in obtaining government approval and permits. For example, setting up a food factory requires licenses from several authorities (e.g. to apply for sewage treatment and fire safety compliance licenses from different departments). In addition, 45.2% of respondents lack insufficient information when applying for factory license or certificate of origin. The industry generally hopes the government to simplify licensing applications or provide one-stop services to reduce the administration burden on manufacturers.

Chapter 5

International Trends in Manufacturing Development

The financial crisis of 2008 has dealt a severe blow to many developed economies. After that, faced with the threat of economic downturn, high unemployment rate and double deficits in trade and budget, advanced economies looked to reviving local manufacturing sector to restore a healthy mix in the economy[56]. A US study pointed out that for every 100 jobs lost in the durable goods manufacturing industry, the society will lose another 744.1 associated jobs in other industries. By comparison, the indirect job loss for every 100 retail trade jobs lost is only 122.1. It can be seen that the chain reaction of manufacturing to the local economy and employment is far greater than other economic activities[57].

Knowing that the manufacturing sector is the backbone of national economy and helps to bring up the development of other industries, administrations began to roll out comprehensive and long-term industrial policies to revive economies. In the meantime, heavy investments were made on scientific research, advanced manufacturing and industrial digitisation etc., to strengthen core technological competence and build advanced industries for the nation, thereby creating high-quality, high value-added job opportunities for the people. As early as 2010, "The Economist" has noticed the global revival of industrial policies, especially in advanced economies[58]. Germany, Japan, South Korea, China and Singapore etc. have successively put forward national strategies and co-ordinated policies for re-industrialisation and develop key emerging manufacturing industries. In 2011, former US President Barack Obama launched the Advanced Manufacturing Partnership with an investment of more than US$500 million, motivating top academies and technology companies to enhance the core capabilities of the US manufacturing industry[59]. Indeed, the manufacturing sector has moved away from the labour-intensive nature in the past where competitiveness lies on the ability in cost reduction. On one hand, emerging manufacturing companies must build up irreplicable technological competence by devoting into R&D to maintain long-term competitiveness. Besides, facing the urgent needs of digitalisation and technological advancement, traditional manufacturing companies also need to find new ways to maintain competitiveness other than the existing cost-reduction approach. Building original brands and engaging in product design are some of the means adopted by manufacturers to seek a more dominant position in the industry chain.

For developed countries or regions, this technology-based manufacturing industry and the corresponding producer service sectors will be an important pillar for maintaining economic stability and sustainable growth. Therefore, governments around the world spare no efforts in investing huge resources in core scientific research, STEM education and supporting enterprises to formulate long-term industrial blueprints and direct economic development. The "14th Five-Year Plan" announced by China in late 2020 also sets the direction for the development of high-tech industries in the Mainland and the Greater Bay Area. Public procurement is also one of the commonly adopted tools by many administrations to stimulate growth in specific industries.

56 Karl Aiginger and Dani Rodrik. January 2020. Rebirth of Industrial Policy and an Agenda for the Twenty-first Century. Journal of Industry, Competition and Trade (2020) 20: 189-207.
57 Josh Bivens, Economic Policy Institute, 23 January 2019, Updated Employment Multipliers for the US Economy.
58 The Economist, 5 August 2010, The Global Revival of Industrial Policy.
59 President Obama Launches Advanced Manufacturing Partnership. The White House. https://obamawhitehouse.archives.gov/the-press-office/2011/06/24/president-obama-launches-advanced-manufacturing-partnership

Chapter 5

International Trends in Manufacturing Development

On the other hand, the worldwide COVID-19 pandemic in 2020 shows no sign of waning and has left a lasting impact on the world economy. Epidemic control measures have restricted the flow of people, goods and capital, seriously affecting cross-border production cooperation and posing a huge impact on the global supply chain and raw material prices. Nonetheless, China has demonstrated effective control of COVID-19 to the world. It was the first country to fully restore production capacity and the flow of people and goods, with a moderate growth in foreign trade against the odds. In recent years, the emerging economic strength of China has led the US government to regard it as a competitor and unite its allies in Europe, Australia and Japan to counter China's political and economic influence across the world. Based on this inference, the world economy will gradually divide into separate systems dominated by China and the US respectively. In particular, different sets of standards in cutting-edge high-tech industries may emerge as a result, which will lead the manufacturing sector to develop along different paths in response to market demand.

Despite the competition in multiple economic and political fields, China and the US have repeatedly affirmed that collaboration is possible in addressing climate crisis and environmental issues in line with international consensus, opening up a comparatively low-risk pathway for enterprises to develop new businesses. In order to promote economic recovery, in addition to short-term countercyclical measures, many economies have attempted to direct local manufacturing onto "green transformation". According to the initial analysis of the Organization for Economic Co-operation and Development (OECD) in 2020[60], at least 30 OECD countries and major partner countries have adopted measures to support the transition to a green economy as the cornerstone of economic recovery plans or strategies. It can be expected that the global manufacturing sector will develop in the direction of green transformation and circular economy to create new growth impetus.

This chapter will make in-depth discussions on the aforementioned development directions of manufacturing around the world, especially in areas of greater impact on Hong Kong-invested manufacturers.

5.1 China's "14th Five-Year Plan" and 2035 Vision

On 3rd November 2020, the Central Government announced the *14th Five-Year Plan (2021-2025) for National Economic and Social Development and the Long-Range Objectives Through the Year 2035 adopted by the Central Committee of the Chinese Communist Party* ("14th Five-Year Plan") which is a programmatic document for China's economic and social development in the next five to fifteen years. In terms of manufacturing industrial policy, the national government clearly stated in the "14th Five-Year Plan" to "maintain a stable proportion of the manufacturing sector" and to "facilitate the modernisation of industrial supply chains" so as to realise the "Made in China 2025" strategy released in 2015. In addition to maintaining the proportion of manufacturing, the Mainland has also devoted to transform "Made in China" into "Intelligent Manufacturing in China", encompassing 5G, big data, cloud computing, artificial intelligence, block chain and other technologies to improve manufacturing efficiency. This has established a favourable policy environment for the upgrade and transformation of Hong Kong-invested manufacturers in the Mainland.

60 Making the green recovery work for jobs, income and growth. http://www.oecd.org/coronavirus/policy-responses/making-the-green-recovery-work-for-jobs-income-and-growth-a505f3e7/#endnotea0z11

5.1.1 Helping SMEs adopt industrial IoT

The core strategy for the Mainland to promote "Intelligent Manufacturing in China" is to accelerate the adoption of industrial internet of things ("IIoT"). At the inception stage of " 14th Five-Year Plan", the Ministry of Industry and I*nformation Technology has issued the Industrial Internet Innovation and Development Action Plan (2021-2023)*, in which assistance was provided to SMEs to help them upgrade and transform with the use of IIoT. The Action Plan states that domestic SMEs have relatively low intention to invest in IIoT where insufficient funds and talents are engaged in this aspect. The government must assist SMEs to overcome their limitation of weak technical foundation and accelerate their investment in the IIoT. Since a majority of Hong Kong-invested manufacturers in the Mainland are between Industry 2.0 and Industry 3.0, they should ride on the policy measures of the Action Plan[61] to upgrade and transform their operations.

5.1.2 Ten key development industries

In addition to the development of IIoT, China also places focus on investing into new industries to master and control the development of core technologies, with the aim to resolve the reliance on importing key components and technologies in the production chain from foreign countries. The development route of "Made in China 2025" was revised in 2017. In February 2018, the *Green Paper on Key Technology Innovations of <Made in China 2025> - Technology Roadmap (2017 Edition)* was officially published, listing ten key development industries and 23 clear directions for industrial development, including:

Table 5-1 Ten key development industries

Ten key development industries	23 clear directions for industrial development
1. Next-generation Information Technology	1. Integrated circuits and specialised equipment
	2. Information and communication technology equipment
	3. Operating system and industrial software
	4. Core information equipment for intelligent manufacturing
2. High-end CNC machine tools and robots	5. High-end CNC machine tools and basic manufacturing equipment
	6. Robots
3. Aviation and aerospace equipment	7. Aircraft
	8. Aircraft engine
	9. Aviation equipment and systems
	10. Aerospace equipment
4. Maritime engineering equipment and advanced shipbuilding	11. Maritime engineering equipment and advanced shipbuilding
5. Advanced railway transportation equipment	12. Advanced railway transportation equipment
6. Energy saving and new energy vehicles	13. Energy saving vehicles
	14. New energy vehicles
	15. IoT-connected vehicles
7. Energy equipment	16. Power generation equipment
	17. Electricity transmission and transformation equipment
8. Agricultural equipment	18. Agricultural equipment
9. New materials	19. Advanced basic materials
	20. Key strategic materials
	21. Cutting-edge new materials
10. Biomedicine and high-performance medical device	22. Biomedicine
	23. High-performance medical device

Source: Green Paper on Key Technology Innovations of <Made in China 2025>-Technology Roadmap (2017 Edition)

61 Ministry of Industry and Information Technology: Plans to promote the upgrade and transformation of the industrial Internet & intranet of 100 leading enterprises this year (People's Daily Online, 13th July 2020). http://it.people.com.cn/n1/2020/0713/c1009-31781000.html.

5.1.3 Hong Kong's role and opportunities

After the Central Government promulgated the macro guiding ideology of "14th Five-Year Plan", Guangdong Province passed the *Recommendations on the formulation of Guangdong's 14th Five-Year Plan and the 2035 long-term goals*, putting forward the 2035 visions such as "joining hands with Hong Kong and Macao to build an international R&D hub with global influence" and "forming a new pattern of opening up to the outside world with participation in international economic cooperation and comprehensive competitive advantages". Passed in early 2021, the *Guangdong province's proposals for formulating the 14th Five-Year Plan for National Economic and Social Development and the Long-Range Objectives Through the Year 2035 (Draft)* also lists in detail the specific work assignments of the Guangdong-Hong Kong-Macao Greater Bay Area in implementing the "14th Five-Year Plan".

The Mainland staunchly supports Hong Kong in becoming the international R&D hub that fully utilise the strength of Hong Kong to contribute to the national development. As a hub between internal and external circulation, Hong Kong has important strategic value in the national strategies. Despite China-US relations, Hong Kong is still considered an independent customs territory where the import and export of certain key components or products to and from the US are more convenient than in the Mainland China, constituting an unique advantage in scientific research and innovation. The excellent basic research capabilities of Hong Kong tertiary institutions can contribute to the Mainland's pursuit of developing core technologies, with the support of production bases in the GBA to commercialise research outcomes. In the 2020 Policy Address, it was announced that Hong Kong and Shenzhen governments will jointly build the Shenzhen-Hong Kong Cooperation Zone for Technology and Innovation with the support from Central Government, where Shenzhen Innovation and Technology Zone and HSITP in the Lok Ma Chau Loop will serve as the two nodes to realise the "one zone, two parks" arrangement at "one river, two banks" under the auspices of "one country, two systems". Before the completion of the HSITP in the Lok Ma Chau Loop, Hong Kong companies can settle earlier in the Shenzhen Innovation and Technology Zone to make full use of the cross-border innovation and technology ecosystem.

With the rich experience in manufacturing, R&D capabilities and the support of China-Hong Kong policies, Hong Kong has great advantages to develop in a variety of industrial sectors. The following will describe the role of Hong Kong as an international R&D hub in the microelectronics industry and medical device industry.

1. Microelectronics Industry in Hong Kong

Regardless of Hong Kong or the Mainland, the proportion of Hong Kong-invested manufacturers engaged in the electronics industry is higher than that of other manufacturing industries. From the analysis in Chapter 2, it can be seen that Hong Kong-invested electronics manufacturers have comparative advantages building on their long development time and the accumulated experience in integrated circuit design.

Hong Kong electronics manufacturers had carried out chip design R&D since the 1990s. The "Motorola DragonBall" chip was designed by Hong Kong, produced in the US and tested in Hong Kong. The R&D team also developed application software and product prototypes with different functions for the chips for selling to major manufacturers. *Qi* wireless charging technology, which was later recognised as an international wireless charging standard, was also invented by a Hong Kong research team and was later acquired by Wireless Power Consortium in 2006. These two examples prove that Hong Kong's microelectronics has a solid foundation in R&D.

In 2019, Hong Kong Science and Technology Parks Corporation launched the "iDM2 Micro-Electronics Node Program" based on FPGA (Field Programmable Gate Array) technology, assisting start-ups and partner companies to develop hardware products through the application of microelectronics design, so that local STEM graduates have more room to bring their potential into full play. Hong Kong's microelectronic products can be industrialised through the "designed in Hong Kong and produced in GBA" model. Hong Kong-invested manufacturers can also make good use of Hong Kong's comprehensive IP protection regime to safeguard patents.

The Guangdong Development and Reform Committee, the Guangdong Association for Science and Technology and the Department of Industry and Information Technology of Guangdong Province jointly formulated the *Guangdong Province's Action Plan for Cultivating Strategic Emerging Industrial Clusters of Semiconductors and Integrated Circuits (2021-2025)* in 2020, setting a revenue target of RMB 400 billion by 2025 for the industry with an average annual growth rate of more than 20%. A clear division of labour is outlined for GBA cities in the industrial layout plan. Guangzhou, Shenzhen and Zhuhai will become the core cities of industrial clusters. Guangzhou and its surrounding areas will be the largest distribution centres and consumption centres for integrated circuits in China; Shenzhen will focus on advancing integrated circuit design; while Zhuhai will focus on the development of chip design. Although the Hong Kong Government and the industry actively responded to the development of microelectronics industry in the Mainland, Hong Kong has not yet been fully integrated into this GBA Industrial Cluster Action Plan to form an interlocking industrial chain. Together with the upcoming Microelectronics Centre in Hong Kong, Hong Kong-invested electronics manufacturers that have taken root in Dongguan and Shenzhen should take this opportunity in helping the Mainland break-through the bottleneck of third-generation semiconductor development and meet the surging demand for semiconductors in IIoT development in the Mainland.

In February 2021, the national Ministry of Science and Technology also stated that it will further expand the Central Financial Science and Technology Plan, supporting qualified scientific research institutions in Hong Kong to cooperate with Mainland institutions in undertaking national basic research projects. The role of Hong Kong in the microelectronics industry chain is set to become even more prominent.

2. Medical device industry

The study report of the US University of Washington on world population predicted that the global population of 80 years or older will increase from the current 140 million to 870 million by the year 2100. The growth of the world's aging population stimulates investment in the medical device industry in order to win first-mover advantage in this market.

According to the *Analytical Report on the Competitive Landscape and Leading Enterprises in the Medical Device Industry of Mainland China*[62] published by Qianzhan Industry Research Institute, most of the Mainland manufacturers are focusing on low-end products while the high-end product market is dominated by foreign-funded brands. In order to support domestic enterprises to reach more advantageous position in this industry, the National Medical Products Administration issued the *Notice on Work Plan for Supervision, Innovation, and Development of Drugs and Medical Devices in Guangdong-Hong Kong-Macao Greater Bay Area* in 2020, planning to establish a complete drug and medical device supervision system within the GBA by 2035. This Work Plan will provide a legal basis for the integration of pharmaceutical and medical device markets across GBA and position Hong Kong as the intermediary to align product standards between Mainland China and the world.

At present, Hong Kong generally applies USFDA and CE marking as the certification for local medical devices. Registration certification of the National Medical Products Administration is required for sales in the Mainland market. If the standards and registration procedures for medical devices can be aligned across the GBA, it will help reduce certification costs significantly and allow products R&D by Hong Kong to gain access to the large-scale market in the GBA.

5.2 Two systems in high-tech industries

For a long time, the international committees led by Western technical experts has established industry standards in different fields across manufacturing and trading to take leading position in the operation of international trade. From bolts and electrical plugs to shipping containers, manufacturers must follow such international standards. In addition to the advantages in product design and manufacturing, European and American countries' control of the international standard formulation process also brings them considerable premiums. In particular, European and American enterprises that hold relevant patents can earn hundreds of millions of dollars in revenue by licensing patented technologies. Critiques[63] suggested that one of the triggers of China-US trade conflict could be the worry of European and American countries on the Mainland's "Made in China 2025" strategy that may potentially weaken the influence of current international standards and the business interests enjoyed by European and American companies.

After "Made in China 2025", the Mainland proposed a 15-year blueprint for "China Standards 2035" in 2020, determining to promote China's participation in formulating global standards from manufacturing, system exchange to consumption in new technology fields, especially in emerging industrial fields such as

62 The ageing population has created great business opportunities in the medical care market of the Mainland (China Times Online, 24th February 2019). https://www.chinatimes.com/newspapers/20190224000177-260301?chdtv.

63 The US suppression measures are expected to expand to different fields (Oriental Daily, 14th July 2018). https://orientaldaily.on.cc/cnt/news/20180714/mobile/odn-20180714-0714_00176_018.html.

Internet of Things, cloud computing, big data, 5G, artificial intelligence etc. In order to bolster influence in the formulation of international standards, the Mainland encourages enterprises to submit technical documents to standard-setting organisations, such as International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC). Taking the formulation of international standards for telecommunications as an example, the number of documents submitted by China in this category accounted for 33% of the total in 2019, which is more than the total of the US, Japan and South Korea altogether.

In the competition of formulating standards in the field of new technology, the US has repeatedly used sanctions to prevent Chinese enterprises from developing new technologies and gaining market share. For example, in terms of 5G, the US imposed sanctions on Huawei on the grounds of threatening national security in order to prevent China from obtaining more technology patents and charging the US a large amount of royalties in the future 5G applications. The US Department of Commerce included Huawei in the Entity List and the Military End-User List, forcing Google, Qualcomm and Intel to terminate their cooperation with Huawei. Besides, the US also obstructed Chinese-funded DJI from purchasing parts from the US for their development in software applications, network services, batteries and imaging products, weakening DJI's influence on the international standards of civil unmanned aircraft systems.

In the short term, the sanctions imposed by the US are a major blow to the development of high-tech fields in the Mainland. However, it has also prompted China to strengthen its basic scientific research and accelerate investment in creating another proprietary system to get rid of the dependence on American components, parts and patented technologies. Taking advantage of its huge domestic market, China can apply new systems broadly to improve the survival rate of new products. Taking Global Positioning System (GPS) as an example, the BeiDou Navigation Satellite System independently developed by the Mainland completely broke the market monopoly of the US since 1978. At present, most of the Mainland brand mobile phones support both BeiDou and GPS systems, and Apple has also begun to launch mobile phones that support the BeiDou system. The formation of "one world, two systems/standards"[64] has been accelerated even further under the China-US trade dispute.

After signing the Regional Comprehensive Economic Partnership ("RCEP"), the market of innovation and technology products from the Mainland will be even larger. Through standard-setting in the field of telecommunication with countries in Southeast Asia and along the Belt-and-Road, the interconnection of information and data infrastructure[65] will further enhance the influence of China's standard system.

The formulation of international regulations will also cover the scope of e-commerce. In early 2021, Guangzhou City promulgated *Measures for Guangzhou to Grasp the Opportunity of Regional Comprehensive Economic Partnership (RCEP) to Promote the Innovative Development of Cross-Border E-Commerce (Draft for Comment),* proposing to contribute Guangzhou's knowledge to the formulation of global cross-border e-commerce rules, and to award up to RMB 500,000 to enterprises that lead the formulation of international, national and industry standards for cross-border e-commerce[66].

64 The implication of "One World, Two Systems" on the global value chain (Commercial Times, 28th May 2020). https://view.ctee.com.tw/processing/20060.html.

65 The China Communications Standards Association pointed out that 5G, Industrial Internet of Things (IIoT), Internet of Vehicles, Internet of Things, artificial intelligence, blockchain, big data, mobile Internet, smart devices, network security, quantum communications, navigation, communication infrastructure, information consumption and other fields, are the key works of the association's standard development. CCSA Dai Xiaohui: 148% of key standards completed in 2018. while 5G standards will be completed by phase (C114 Communication Network, 16th January 2019). http://www.c114.com.cn/news/16/a1076986.html.

66 Guangzhou first launched 25 local supporting measures for RCEP, gathering public opinions on developing Guangzhou as the live broadcast capital of RCEP (Guangzhou Daily, 4th February 2021).http://m.house.china.com.cn/view/1703459.

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It can be expected that manufacturers in the high-tech field must be fully prepared to adapt to the two systems or standards. In the layout of the supply chain, manufacturers may encounter information security standards and certification requirements set by China and the US when developing software, which may induce considerable impact on production costs.

5.3 Stimulate specific industries with public procurement

Since the financial crisis of 2008, the global economy has been caught in a low-growth trap. It is commonly agreed that weak demand is the main cause of this secular stagnation. In an environment of low interest rates and low inflation, monetary policy has limited impact and it is difficult to create an incentive effect on the real economy. Therefore, governments around the world adopt expansionary fiscal policies to guide resources flow to support economic structural reforms. In addition to government subsidies and the establishment of special funds, countries including the UK, South Korea and Mainland China have adjusted government procurement strategies as a supplement to implementing economic and industrial policies. In October 2018, the Organization for Economic Co-operation and Development (OECD) issued a report[67] stating that government procurement should be taken as a strategic development tool to promote industrial policy goals at various levels such as sustainable development, SME development and innovation. In January 2021, the new US President Biden signed the "Buy American Act" executive order to give priority to purchasing products and services manufactured by American workers and companies in the federal procurement. At the same time, US manufacturers will be given price advantage against foreign service providers in federal procurement to strengthen their competitiveness and secure domestic employment.

Due to the limited scale of private consumer market in Hong Kong, the government may consider adjusting public procurement policies to support the local manufacturing industry, SMEs and start-ups. According to Census and Statistics Department, from 2019 to 2020, Hong Kong's government procurement totaled HK$139.3 billion, accounting for 22.9% of total public expenditure (HK$609.33 billion) and 5% of GDP (HK$2.8 trillion) that year. If the government can purchase locally-manufactured products or services with public procurement, it will be a considerable amount of resources to support local industrial development.

5.3.1 Hong Kong's public procurement policy

At present, Hong Kong's public procurement procedures are regulated by the *Stores and Procurement Regulations* under the *Public Finance Ordinance* and must also be consistent with the principles of the *World Trade Organization Government Procurement Agreement* (WTO GPA)[68], creating a fair and open competitive environment for product or service providers who intend to participate in public procurement. Although the WTO GPA has a mechanism for negotiating exemptions among contracting members, the Hong Kong Government did not propose any reduction or exemption negotiations when signing the WTO GPA in 1997, which greatly reduced the flexibility of using public procurement in directing economic policies. Under the

67 OECD Public Governance Reviews, SMEs in Public Procurement. https://www.oecd-ilibrary.org/sites/9789264307476-4-en/index.html?itemId=/content/component/9789264307476-4-en.
68 Hong Kong acceded to the Agreement on Government Procurement and became one of the 21 parties of the Agreement.

existing public procurement mechanisms and principles, the competitiveness of Hong Kong SMEs or local start-ups is weak. Even though the government enhanced its policy in 2019 to allow departments to increase the weighting of technical scores and reduce the weighting of past experience in the score with the aim to favour innovative start-ups in procurement[69], the impact of this policy to improve the chances of SMEs and start-ups obtaining government procurement contracts remains to be seen.

5.3.2 Exemption measures of public procurement policy under WTO GPA

Most WTO GPA signatory countries/regions, such as the UK, Australia and South Korea, formulate procurement policies in accordance to the WTO GPA framework with specific reduction and exemption conditions permitted by the agreement to enforce policies to support the development of SMEs or promote specific industrial, social, and environmental policies, which is of useful reference for Hong Kong.

Table 5-2 Reduction and exemption measures of foreign public procurement policies

The United Kingdom
- The government proposes to purchase from SMEs with 33% of the total government procurement expenditure by 2022; - In 2016, a SME advisory panel was established with representatives of SMEs under Crown Commercial Service appointed to assist the government in increasing the procurement expenditure on SMEs to achieve the target ratio.
South Korea
- The enforcement decree of the Act on Facilitation of Purchase of SME-Manufactured Products and Support for Development of their Markets stipulates that public organisations must provide SMEs with more opportunities to participate in government procurement, and the proportion of procurement expenditure on SMEs should be at least 50% of the total procurement volume; - In order to alleviate cash flow pressure on SMEs, the government prepays 70% of the contract value to SMEs, which can be collected within four working hours at the soonest; - Korean Small and Medium Business Administration cooperates with the government to formulate a product list, among which designated products only accept bids from SMEs.
Australia
- Australia has negotiated with the contracting parties of WTO GPA at the national level regarding exemptions on its procurement policies. For example, any form of preferential benefit to SMEs; measures that are beneficial to the well-being and welfare of the indigenous people, economic and social progress; national security measures such as the procurement of defense equipment, or defense services, systems and equipment related to supporting military forces; R&D services etc.; - The"Local Procurement Policy"enforced in 2019 allows government agencies to directly purchase any products not exceeding AUD 50,000 from SMEs, and the total purchase amount can reach up to AUD 250,000.
Canada
- Canada's exclusion list includes various assistance programs for SMEs; - Under the jurisdiction of Public Services and Procurement Canada, the Office of Small and Medium Enterprises was established with a total of six regional offices within the territory to assist SMEs in participating in government procurement and advocate to government agencies to review policies to remove obstacles and problems faced by SMEs who participate in government procurement[70].

69 Legislative Council Panel on Financial Affairs 2018 Policy Address Policy Initiatives of the Financial Services and the Treasury Bureau (LC Paper No. CB(1)12/18-19(01)). https://www.legco.gov.hk/yr18-19/chinese/panels/fa/papers/fa20181030cb1-12-1-c.pdf.

70 Public Services and Procurement Canada. Help for Small and Medium Enterprises. https://www.tpsgc-pwgsc.gc.ca/app-acq/pme-sme/index-eng.html.

Chapter 5
International Trends in Manufacturing Development

Although SMEs are the main economic force of these countries (accounting for more than 95% of enterprises), it is difficult for them to compete with large enterprises because of their scattered scale. If the government insists on treating SMEs and larger enterprises on equal terms in its procurement policy, it will only tilt procurement towards larger enterprises and obstruct market competition. The Hong Kong Government should take reference of the strategy adopted by other WTO GPA contracting members and propose reductions and exemptions under the agreement in order to utilise government procurement policies to enhance the survival and development of local SMEs.

5.3.3 Public procurement policies in the Mainland

The use of public procurement to guide the flow of resources is a common economic policy in non-WTO GPA economies. Taking the Mainland as an example, on the basis of *Government Procurement Law of the People's Republic of China*, the Mainland government also formulated *Measures for Promoting the Development of Small and Medium-sized Enterprises through Government Procurement* to promulgate precise support to SMEs. In addition to setting aside purchase shares for SMEs, this law also specifies that procurement must be made to SMEs if the goods and services required are of less than RMB 2 million value and are appropriate for SMEs to provide. Article 9 of this law further encourages large and medium-sized enterprises to form a consortium with small and micro-enterprises, or allows large and medium-sized enterprises to subcontract procurement projects to one or more small and micro-enterprises. If this specific condition is met, the procurer and procurement agency shall give a deduction of 2%-3% (1%-2% for construction projects) to the quotation of these tenderers in the price comparison assessment.

At present, the Mainland has started negotiations on signing the WTO GPA. In the bid list that has undergone seven revisions, procurements to support SMEs and promote the development of ethnic minorities and poverty-stricken areas are listed as non-applicable items in the agreement[71]. In order to further protect the enforcement space of public procurement as a fiscal policy, the Mainland government also stipulates in the agreement that it reserves the right not to implement national treatment for special procurement that may impede major national policy. In other words, while opening up the public procurement market, each WTO GPA member also protects its own economic and industrial development needs by formulating various reasonable reduction and exemption measures.

Since the Hong Kong Government has been a member of WTO GPA for 24 years, economic development situation has changed vigorously where strategies adopted in the past shall be reviewed for their appropriateness in the current times. The industrial and business community has put forward various proposals and discussions on government procurement over the years, in the hope that the government can make good use of the reduction and exemption mechanism to formulate public procurement policies in line with WTO GPA principles for the development of specific industries and support SMEs.

5.4 "Green transition" and circular economy in the manufacturing sector

In order to revive the economy, in addition to short-term counter cyclical measures, various countries also encourage "green transition" of industries to enhance the resilience of weak economies and discover new growth areas. International community has reached a consensus on climate change and environmental

71 China Government Procurement Network: Chinese government procurement service information platform. WTO Government Procurement Agreement. http://www.ccgp.gov.cn/wtogpa/

issues, making this a relatively low-risk development strategy for the industry even in the current unstable international situation.

Investing in the development of low-carbon industries does not mean compromising economic growth. Scholars indicated that in addition to conserving the nature, low-carbon industries will bring greater economic benefits, create more employment opportunities and reduce operating cost in the long run[72]. According to McKinsey's estimate, implementation of a green stimulus plan between EUR 75 to 150 billion in European countries can generate a total added value of EUR 180 to 350 billion, create three million new jobs and reduce carbon emissions by 15% to 30% in 2030.

5.4.1 Green transition strateay in selected economies

Table 5-3 Green economy plans in selected economies

Economy	Key Strategies
EU - European Green Deal[73]	• Large-scale renovation of buildings and infrastructure to improve energy performance and create local employment opportunities; • Introduce renewable energy plans, especially in wind and solar energy, and promote Europe's clean hydrogen energy economy; • Cleaner transportation and logistics, including the installation of one million electric vehicle charging stations and eco-friendly fuel supply stations, as well as to encourage rail travel and clean transportation across cities and regions; • Adopt new industrial strategy based on circular economy to encourage the production of reusable products and eco-friendly packaging, promote new business model based on rental and reuse, reduce the consumption of disposable products, and help traditional energy-intensive industries reduce carbon emission and develop towards modernisation; • Implement the Just Transition Fund to help companies carry out green transitions and create new businesses and jobs.
South Korea - Korean New Deal[74]	The goal is to invest a total of KRW 42.7 trillion by 2025 and create 659,000 job opportunities. The main strategies are: • Green transition of buildings: improve energy efficiency of buildings through the use of renewable energy generation systems and high-efficiency insulation materials; • Green energy: invest in scientific research to help the country adopt sustainable and renewable energy sources and increase the supply of electric vehicles and hydrogen fuel cell vehicles. It is planned to increase the power generation from renewable energy sources from 12.7GW in 2019 to 42.7GW in 2025, and develop scientific research advantages in hydrogen energy and hydrothermal technology; • Innovative environmental industry: Support R&D, testing and industrialisation of SMEs in the environmental and energy industries, provide infrastructure and encourage investment in green industries, and build cleaner and energy-saving factories.
Japan - Green Growth Strategy	Achieve the goal of carbon neutrality by 2050 with the plans to promote emission reductions in 14 key areas including offshore wind power generation, electric vehicles, hydrogen energy, aviation and residential buildings. It is estimated that this strategy will drive JPY 90 trillion-worth of economic growth by 2030 and JPY 190 trillion-worth of economic growth by 2050. Specific measures include: • Establish a JPY 2 trillion fund for the R&D of innovative technologies for achieving carbon neutrality; and set up a long-term university fund of about JPY 500 billion to strengthen R&D capabilities and talent cultivation in academic institutions; • Establish a business restructuring subsidy framework of JPY 1,148.5 billion to help SMEs in their green transition; • Tax reductions will be given to companies investing in energy conservation and green transition.

72 Engel, H., Alastair H., Solveigh H., Tomas N., David F., Dickon P., Matt R., Sophie B., Peter C., and Sebastien L.. How a post-pandemic stimulus can both create jobs and help the climate, McKinsey, 2020-05.
73 European Commission. A European Green Deal. https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en.
74 Government Releases an English Booklet on the Korean New Deal. Ministry of Economy and Finance, Republic of Korea, July 2020. https://english.moef.go.kr/pc/selectTbPressCenterDtl.do?boardCd=N0001&seq=4948.

5.4.2 Green transition of the production chain

Accounting for a quarter of global GDP, industrial activities is also one of the three major sources of greenhouse gas emissions. In order to speed up post-COVID-19 economic recovery, the G20 is propelling "green industrial revolution" to rewrite traditional industry standards and strengthen the top-level design of low-carbon transition, with the prime objective to assist resource-intensive and carbon-intensive industries to implement green transition and develop towards clean production. In addition to green new deals, the European Union, India and the US in the G20 have set up targets for "net-zero emissions" and "carbon pricing" for industrial de-carbonisation. China is also experimenting the "zero-waste city" by setting up a pilot project of "zero-carbon industry" in Shenzhen[75]. The green transition of manufacturing not only effectively reduces carbon emissions, but also speeds up the upgrade and transformation of the manufacturing sector with wider adoption of innovative technologies and new production designs to reduce resources consumption.

Starting from major sources of carbon emissions such as energy, manufacturing, construction and transportation, the China's "14th Five-Year Plan" has set the goal to peak carbon emissions by 2030[76] and achieve carbon neutrality by 2060 respectively. The Guangdong province has also made specific plans in accordance to these two national goals. In February 2021, the Guangdong Government issued the *Work Plan for the Pilot Programme of "Zero-Waste City" Building* which takes Shenzhen as a pilot location to build a city of green production and green lifestyle by the end of 2023. The first task of the Work Plan is to promote industrial green production and maximise resource utilisation of industrial solid waste. The industries involved include the electronics and textile industries which many Hong Kong-invested manufacturers engage in. Other than that, the Work Plan also encourages the development of green products, the construction of green supply chains and green factories, as well as the application of innovative technology, 5G and IIoT etc. to make fundamental changes to industrial production.

According to the result of this study, Hong Kong-invested manufacturers in the Mainland have significantly increased their investment in technology R&D. Many respondents indicated that they hope to apply environmentally friendly design elements and invest in new production technologies based on circular economy. Taking the textile industry as an example, the R&D of new materials and recycled fibre have become game-changers in this sector, such as Lyocell fibre, kapok fibre and fibre made from recycled materials, providing wider variety of raw materials choices and helping reduce operation costs. Manufacturers can also open up new sources of income by transferring mature production technologies.

In the 2021-22 Budget, the Hong Kong Government took one step further to develop the green bond market and promote private capital investment in low-carbon projects. As an international financial centre, Hong Kong has excellent capabilities to develop green financial instruments and raise fund for the green transition of regional production chain.

75 UNEP, Executive Summary of Emissions Gap Report 2019. https://wedocs.unep.org/bitstream/handle/20.500.11822/30798/EGR19ESCH.pdf.
76 "Peak carbon dioxide emissions" is the country's commitment to stop the increasing carbon dioxide emissions before 2030, and then slowly decline after reaching a peak.

5.4.3 Establishing circular economy in the GBA

In addition to developing green finance, the Hong Kong Government has also attached great importance to the local environmental industries in recent years. In 2021, *Waste Blueprint for Hong Kong 2035* and *Hong Kong Roadmap on Popularisation of Electric Vehicles* were released to establish long-term goals and development plans for achieving a sustainable local circular economy. Besides the closed-loop cooperation in the recycling industry, there's also great potential for them to collaborate with other industries to achieve circular economy for mutual benefits[77]. For example, the waste materials of one industry can become production resources for another industry, which can get rid of linear production and enhance the synergy across sectors. Therefore, regions with more diversified manufacturing sectors have better foundation to achieve a circular economy with the feasibility of cross-sector cooperation in the use of resources.

The national Ministry of Commerce once stated that China has the world's largest and most diverse manufacturing ecosystem with the comprehensive supporting facilities. The flexibility of resource recycling and collaboration between industries can be extremely strong. Hong Kong-invested manufacturers can establish a circular economy network across the border riding on the huge manufacturing system of the GBA and policies such as *Work Plan for the Pilot Programme of "Zero-Waste City" Building*.

The Hong Kong Government can also help Hong Kong-invested manufacturers in the Mainland speed up their green transition by optimising existing funding schemes. In 2008, the Environmental Protection Department and the then Economic and Information Technology Commission of Guangdong Province launched the "Cleaner Production Partnership Programme", assisting Hong Kong-invested manufacturers located in Hong Kong and Guangdong Province to adopt cleaner production technologies and operating methods. The plan has achieved significant environmental benefits and the programme has been extended to 2025. However, this funding programme does not cover the R&D of products applying recycled resources and green production materials, and therefore it cannot serve to encourage Hong Kong-invested manufacturers to further develop green production.

77 Through the gathering of different industrial clusters, enterprises can exchange materials, energy, water or by-products, and share infrastructure to enhance the overall competitive advantage and reduce the impact on the ecology. The cost of waste disposal and product manufacturing can be reduced.

Chapter 6
Policy Advocacy

This research presented a multi-perspective analysis of the current development status of Hong Kong-invested manufacturers. Based on the big data analysis in Chapter 2, although the scale of Hong Kong's local manufacturing industry is small, Hong Kong-invested manufacturers in the Mainland have been very active and has driven Hong Kong's producer services that account for more than 40% of the GDP. In recent years, many Hong Kong-invested manufacturers intend to expand their business to Southeast Asia, which will further strengthen Hong Kong's role as a hub for producer services. According to the research results, Hong Kong-invested manufacturers have clear development directions of integrating R&D and design innovation as a way to upgrade and transform production activities; expanding their production network towards "China +1"; developing the Mainland and ASEAN markets; and engaging in high value-added manufacturing in Hong Kong. However, they still face varying degrees of restriction in the course of development, especially in terms of industrial talents, R&D commercialisation and riding on national development strategies to strengthen Hong Kong's role as a manufacturing management centre. The government is anticipated to take a more active approach to pave way for Hong Kong-invested manufacturers towards the desirable direction.

The Hong Kong government first introduced the re-industrialisation strategy in 2016 to develop advanced manufacturing based on new technologies and smart production, with a view to creating new drivers for Hong Kong's local economy. This re-industrialisation strategy drives the manufacturing industry to develop towards technology-intensive and highly automated operations. According to FHKI's observation, there are four main pathways in Hong Kong's re-industrialisation strategy: (1) Promote industrial R&D and engineering design; (2) Hong Kong-invested manufacturers to move part of the production lines back to Hong Kong in order to protect key technologies; (3) Local traditional manufacturing industry to upgrade operations through innovation and technology; (4) Create new sectors of advanced manufacturing activities. Rebuilding the manufacturing sector locally can directly drive the businesses and talent development of technology-intensive producer services such as R&D, application of IIoT, testing and certification. These enterprises and talents can also serve Hong Kong-invested manufacturers operating across the Mainland and Southeast Asia, strengthening Hong Kong's dominant role as the central hub of regional manufacturing industry.

Furthermore, FHKI advocates for a broader understanding to the "Made in Hong Kong" label, which was a connotation for products manufactured in Hong Kong in the past. However, with the vigorous transformation of the manufacturing sector and the trend of Hong Kong shifting towards producer services, "Made by Hong Kong" would be a better term to represent the diverse products that are researched, developed, designed and produced by Hong Kong-invested manufacturers with the intellectual and quality excellence originated from Hong Kong. Local industrial policies should look beyond "re-industrialisation" and **build upon a more holistic view of "industry", taking into account of the unique operation characteristics of Hong Kong-invested manufacturers to cover multiple dimensions of manufacturing activities, from local to abroad, from production to producer services along the value chain, from traditional to emerging manufacturing sectors, from export to domestic sales markets.**

As a result, a comprehensive policy blueprint shall be developed with resources allocated to strategic areas that have far-reaching impact to the local industry and economy, as well as to address the pain points of Hong Kong-invested manufacturers under current conditions and global business trends (See Chapter 3 and 5). In this regard, FHKI has the following major recommendations:

1. **Review economic data to reflect industrial development**
2. **Develop local "re-industrialisation" of selected industries to build core technological competence**
3. **Strengthen producer services to become the hub of regional manufacturing development**

6.1 Review economic data to reflect industrial development

Given the unique ecology of Hong Kong's industry, FHKI is concerned that current economic statistics cannot truthfully reflect the actual contribution and influence of industries on Hong Kong's economy. "Industry" should encompass all the processes of a product starting from scratch to the delivery to consumers: from core technology research, visual and functional design, material selection; to product moulding, assembly, quality inspection; as well as brand positioning, business development, transportation logistics, after-sales service and trade-related financing and insurance services. The longer the production chain, the higher the total output value and the more economic activities are generated. In response to the development of the "front shop, back factory" operation model of Hong Kong's industry in the past few decades, although the manufacturing activities in Hong Kong gradually diminished, the upstream and downstream producer service industries have become more active and prominent **(see Section 3.1.1)**. In the GBA, Hong Kong will play an increasingly instrumental role as the producer service provider for production bases in the Mainland.

In this regard, the volume of industry-related activities in the Hong Kong economy will grow and new types of industries will emerge in response to the changing business landscape. From FHKI's point of view, it is necessary for Hong Kong to review the economic statistics as soon as possible in order to more accurately present the impact of "industry" as a whole to Hong Kong. This will serve as the basis for long-term industrial policy planning, as well as a clear indication to all sectors of the society to understand the influence of industry in Hong Kong's economy today. There are two major aspects that have not been addressed in current statistics collection process:

1. The producer services performed by Hong Kong are an integral part of the industry. As advanced technology gains momentum in industrial activities, more diverse and higher value-added producer services will take place. At present, the Census and Statistics Department **has not yet clearly differentiated "producer services" and present their output value in economic statistics, making it difficult to assess the contribution and importance of industries to Hong Kong's overall economy,** as well as to understand the development trends of related industries. According to the estimates in this study, producer services account for more than 40% of Hong Kong's GDP **(see section 2.3)**. It is worthwhile to devise in-depth classification and analysis to help formulate industrial policies in the future.

2. The current industrial census adopted by the Census and Statistics Department **does not include the offshore production activities and output value of Hong Kong-invested manufacturers.** According to the findings in this study, the total profit of Hong Kong-invested manufacturers in the Mainland in 2019 is approximately HK$680.1 billion, which is equivalent to 23.7% of Hong Kong's GDP that year **(see section 2.1)**. This is a considerable amount to effectively drive the demand of the local producer services. The study also used big data to estimate and analyse the geographical and industrial distribution, business scale and market tendency of Hong Kong-invested manufacturers in the Mainland to serve as a reference for policy advocacy **(see Sections 2.1 to 2.3)**. More systematic collection and analysis of such data by government authorities would definitely help reflect the actual situation of Hong Kong-funded industries more accurately and illustrate the impact of production activities in other places on Hong Kong's economy.

Therefore, FHKI advises that the Hong Kong government review and update statistical methods with reference to foreign practices to obtain useful data for policy planning and target setting:

I. Review the classification method of the service industry

It is recommended to disaggregate "producer services"[78] from the service industry to clearly differentiate the economic value of producer services in local GDP. References can be made to the National Bureau of Statistics' producer services industry classification in 2019 regarding the classification method and concept[79]. This can separate the statistics of producer services and consumer services that are originally calculated together, and to help policymakers understand the output value and trends of various producer services so that more targeted industrial policy deployments can be made.

II. Update industrial classification

With the staunch government support on promoting new industries such as innovation and technology, it can be expected that more diversified economic activities are going to take place in Hong Kong. In order to closely follow the development trajectory of various sectors and make appropriate policy interventions, FHKI suggests the government to revise the industrial classification regularly (e.g. every five years) according to latest economic development, removing outdated categories and adding emerging industry classifications. At the same time, the statistical methods of industrial census can be fine-tuned to enhance data accuracy and aid the analysis of the rapidly-changing modern economy.

III. Conduct census on the offshore production activities of Hong Kong-invested manufacturers

Industrial census is instrumental to the planning of industrial development blueprint. At

78 "Producer service" refers to a service industry that provides guaranteed services for maintaining the continuity of the industrial production process, promoting technological advancement, industrial upgrading and improving production efficiency. It is a supporting service industry directly related to manufacturing and emerging industry emerged from the manufacturing sectors' internal operations, without providing consumers with direct and stand-alone service utility. "Producer service" mainly includes R&D, product design, technical services to support manufacturing activities, transportation, warehousing and courier services, information services, financial services, energy-saving and environmental services, manufacturing leasing services, business services, human resource management and training services, wholesale brokerage agency services and productive support services.

79 National Bureau of Statistics. "Notice on Printing and Issuing the Statistical Classification of Producer Services (2019)" http://www.stats.gov.cn/tjsj/tjbz/201904/t20190417_1660042.html.

present, the Census and Statistics Department only collects data on the domestic industrial activities of Hong Kong-invested manufacturers which can hardly help understand how offshore production activities and conditions induce impact on the Hong Kong economy. Offshore production activities of Hong Kong-invested manufacturers (including the Mainland and Southeast Asia) are becoming more prominent and that the "overseas production and triangular trade value" of Hong Kong-invested manufacturers is an important reference for policy formulation. FHKI advises that the Census and Statistics Department include the gross production value of Hong Kong-invested manufacturers' overseas production units into the "Key Statistics on Business Performance and Operating Characteristics of the Industrial Sector" published every year. This will aid the understanding of how offshore manufacturing activities impact on Hong Kong's economy, and will allow policies promoting Hong Kong-invested manufacturers' overseas production to be formulated to drive the development of the local producer services in turn.

6.2 Develop local "re-industrialisation" of selected industries to build core technological competence

With the northward relocation of manufacturing plants over the years, production activities in Hong Kong have scaled down tremendously. Hong Kong-invested manufacturers take the city as management headquarters only, whereas R&D and product development departments are set up in the Mainland to facilitate communication and cooperation with production teams **(see section 2.3.2)**. However, as technological competence is gaining importance in today's manufacturing sector, Hong Kong-invested manufacturers must look to enhance upstream R&D and core technology capabilities. Through the active policy support of the Hong Kong government, many innovation-driven Hong Kong-invested manufacturers have begun to re-examine the feasibility of establishing R&D base in Hong Kong to ride on the city's rich academic research resources and talents with international perspectives. They are also able to protect key technologies through Hong Kong's sound legal system and become technological leaders in their respective fields.

Having high value-added manufacturing activities locally is the most direct way to drive technological research and the demand for manufacturing technology services. It can also effectively speed up the grooming of talent pool and promote R&D commercialisation between manufacturers and the academia. This will help traditional manufacturers upgrade and transform, create new and advanced manufacturing industries, drive demand of producer services and ultimately reshape the local manufacturing ecosystem. With such foundation, manufacturers can export technology to the Mainland and Southeast Asia to consolidate Hong Kong's dominant role as the headquarters of manufacturing companies in the region. **The Federation is of the view that, despite the fact that large-scale mass production is difficult in Hong Kong, certain most competitive and high value-added manufacturing activities should be selected where policy incentives are offered to encourage their local production, and resources are allocated to tackle the specific challenges faced by Hong Kong-invested manufacturers revealed in this study. These industries will become new pillars of Hong Kong's economy with the focused investments into developing core technology and cultivating manufacturing talent pool.**

6.2.1 Selecting Industries with regard to national economic strategies and local manufacturing capabilities

Among the diverse manufacturing sector, the Government should revisit its "big market, small government" mentality by selecting advantageous industries for promoting local "re-industrialisation". By concentrating resources from the industry, academia and research sectors to develop core technology and groom the manufacturing technology talent base, coupled with facilitative policies and convenience measures, it is expected that the industrial and business communities will be encouraged to invest and pursue development in such industries. When selecting industries, the Hong Kong Government should take into account Hong Kong's ability to deepen industrial advantage. For example, the industry should be a key industry supported by national strategies (including the 14th Five-Year Plan and Outline Development Plan for the GBA). Hong Kong should possess strong R&D capabilities in these fields in our universities and research centres, as well as proven industrialisation capabilities in industrial enterprises. The breadth and depth of producer services driven by the selected industries, market demand and position of the industries across Hong Kong, the Mainland and globally, and whether Hong Kong provides the IP protection, regulations and financing channels needed by the industry, should all be considered. These selected industries may cover traditional and emerging industries, and the level of government participation and means of support are determined in response to industry needs and the challenges faced during re-industrialisation.

In the Federation's view, Hong Kong possesses the ability to develop the following high value-added manufacturing industries, which deserves further government support:

1. **Advanced electronics:** The advanced electronics industry, particularly the semiconductor and integrated circuit industry, is one of the national key scientific and technological domains. The industry has extremely wide applications with strategic significance to national industrial development. In 2020, Guangdong Province issued the *"Action Plan for Cultivating Strategic Emerging Industrial Clusters of Semiconductors and Integrated Circuits (2021-2025)"* to promulgate enhancement in innovation capabilities, breakthrough in core technologies and gathering of top-tier scientific research talents in order to get through the bottleneck of third-generation semiconductor development. Such advancement is instrumental in responding to the huge demand of semiconductors in IIoT applications and bridging the gaps in key components and parts supply in the Mainland. Hong Kong-invested manufacturers have been developing in this industry for a long time and have a solid foundation for industrialisation. Local universities and Hong Kong Applied Science and Technology Research Institute (ASTRI) have also been deeply engaged in this field for many years **(see section 5.1.3 for details)**. Under the government's Innovation and Technology Fund, "Electrical and Electronics" is one of the industrial sectors with the most approved projects and funds[80], with a total of nearly HK$3.99 billion. Moreover, in the "Enterprise Support Scheme" that subsidises local companies to carry out internal R&D projects, this industrial sector accounts for about 30% of the approved projects and funds, which demonstrates that companies

80 Innovation and Technology Fund, ITF Statistics of Distribution of Approved Project among Different Industrial Sectors (As of 28th February 2021) https://www.itf.gov.hk/tc/itf-statistics/index-2.html.

in this industry are keen on scientific research and innovation. On the other hand, Hong Kong's import-export procedures for key components and parts and high-end instruments are more efficient than the Mainland. Coupled with comprehensive intellectual property protection, it is more cost-effective to carry out high value-added assembly processes of advanced electronics in Hong Kong than in the Mainland.

2. **Food technology and food processing:** At present, "food, beverages and tobacco products" is the main local manufacturing industry, accounting for one-third of the total value-added of the industry and is employing more than 34,000 people[81]. For a long time, the processed foods made in Hong Kong have won great reputation from near and far. Local factories have strict food safety and quality control with comprehensive industrialisation qualities, including production facilities, technicians and a mature market network. Moreover, the food industry covers three levels of industries, from fishery and agriculture, vegetarian diet, cultivated meat, food manufacturing technology, plastic packaging, testing and certification, logistics, sales, to food waste treatment and other processes, all of which have great potential for the introduction of innovative technologies to improve production capacity and become high value-added manufacturing industry. The Mainland government actively promotes food quality standards under the directives of the 14th Five-Year Plan, that is, the domestic-sales and export food products of exporting manufacturers must be produced on the same production line, follow the same set of standards and achieve the same quality level in order to align local and overseas food standards. This is an important step to match the food standards in the Mainland and internationally, which will help to streamline regulations on food trade and build up a conducive environment for the export of Hong Kong's processed food items.

3. **Recycling and environmental industry:** Facing the saturation of landfills and increased restrictions against waste export, Hong Kong desperately needs to improve the production chain of its circular economy by promoting the local recycling and environmental industry, thereby expanding the local ability and capacity to handle waste. According to statistics from the Environmental Protection Department, only 29% of municipal solid waste generated in Hong Kong in 2019 was recycled while 88% was exported for recycling[82] . While the government has been promoting the reduction of waste at source in recent years, the next step must involve mobilising the manufacturing sector to construct downstream industries for turning waste into resources; only then can resource recycling be achieved. Therefore, the government should allocate more large scale industrial land to encourage manufacturers to invest in the high value-added recycling industry by introducing new technologies. This will turn the industry into one of the pillars of Hong Kong's re-industrialisation. Moreover, Guangdong Province has promoted the "zero waste city" policy in recent years to encourage green production and resource recycling in manufacturing industries. Local environmental industries can also ride on these policies to take part in the establishment of a cross-border circular economy network.

81 Census and Statistics Department, Table 100 : Principal Statistics for All Manufacturing Establishments by Selected Industry Division (2019).
82 Environmental Protection Department, Statistics of Hong Kong 2019 Municipal Solid Waste https://www.wastereduction.gov.hk/sites/default/files/msw2019tc.pdf.

4. **Biotechnology:** Biotechnology industry is one of the most important areas of scientific research and innovation internationally, as demands for medical healthcare are continuously on the rise due to aging population. Enterprises seek technological breakthroughs and new therapies to promote the development of life sciences. Medical technology is also an important area of innovation promoted by the Hong Kong government. Hong Kong possesses a profound biotechnological research foundation, where many world-class biomedical R&D experts in the university have won top-tier scientific awards at home and abroad. Among the 16 state key laboratories in Hong Kong, nine are engaged in research related to biotechnology, seeking scientific and technological breakthroughs for the country. The Government allocated HK$10 billion to set up two InnoHK Clusters in Hong Kong Science Park, among which the "Health@InnoHK" focuses on medical technology. There are already 15 R&D centres specialising in biomedical technology, including the Guangzhou Institutes of Biomedicine and Health under the Chinese Academy of Sciences, set up under the "Health@InnoHK" platform and has been bringing in overseas scientific research elites to Hong Kong. Through the Hong Kong Science and Technology Parks Corporation, the Hong Kong Government also provides funding and facility support to the biomedical technology sector, which often requires huge investments and a long payback period. Important measures including the set up of Biobank and Biomedical Informatics Platform near the end of 2020. The governments of Mainland China and Hong Kong are actively looking to streamline cross-border circulation of scientific research elements, including the relaxation of restrictions on the transit of human genetic resources and customs clearance for imported animal-derived biological materials, that will facilitate R&D cooperation between institutions in the two places. Furthermore, Hong Kong is the first place in the world whose clinical test data has been approved by international authoritative drug administration agencies like the National Medical Products Administration (NMPA), the US Food and Drug Administration (USFDA) and European Medicines Agency (EMA) for drug registration purposes at one location. In addition, Hong Kong implemented the new listing system at the end of April 2018, allowing pre-profit biotech companies to list on the Hong Kong Exchange. So far, 31 companies have been listed in Hong Kong under the new system, with the amount of IPO financing reaching US$10 billion and the amount of refinancing reaching US$8 billion, making Hong Kong the world's second-largest biotechnology fundraising centre[83]. The above conditions are greatly beneficial to biotechnology manufacturers in riding on Hong Kong's scientific research and intellectual property protection, as well as the Mainland's industrialisation capabilities to fully commercialise the most advanced upstream R&D outcomes.

FHKI advocates that the Hong Kong government should further study feasible policy measures for the high value-added manufacturing industries recommended above. Staggered development strategies should be developed by making full use of the Mainland's industrial policy and focused investments shall be allocated to improve scientific research, education, vocational training, industrial land supply and policy facilitation to these selected industries. It is much anticipated that the Government will facilitate Hong Kong-invested manufacturers engaging in these industries to

83 LCQ9: Biotechnology and healthcare technology. (9th June 2021) https://www.info.gov.hk/gia/general/202106/09/P2021060900432.htm.

establish high value-added production lines in Hong Kong as a new field of development **(Further policy recommendations to be discussed in section 6.2.4)**.

6.2.2 Restructuring the industrial talent system

According to research findings, many Hong Kong-invested manufacturers face difficulties such as industrial talent shortage and high turnover rate when pursuing strategies like upgrading and transformation and local re-industrialisation. Ever since the northward migration of Hong Kong-invested production lines, the demand for manufacturing technicians in Hong Kong has gradually diminished. The industrial talent training system has then lost momentum, whereas colleges and universities no longer offer manufacturing-related courses. Students today mostly adhere to the impression of the older style of labour-intensive manufacturing industry that hinders them from joining the industry. The industry generally faces the predicament of lack of successors, which has also become the biggest obstacle to Hong Kong's re-industrialisation and development of high value-added manufacturing industry. In recent years, some colleges and universities have launched new industry-related courses in view of the global advancement of advanced manufacturing industry, but this remains minority in the education system. Without government intervention to direct local talents towards high value-added manufacturing industries, the progress of talent cultivation would be extremely slow and pull Hong Kong back from advanced manufacturing development opportunities.

In terms of local re-industrialisation, the required industrial talents can be broadly divided into two categories: scientific R&D professionals and industrial technicians. Scientific R&D professionals require more academic background and innovation capabilities to establish core technologies for enterprises and formulate new products and application solutions. On the other hand, industrial technicians are more inclined to practical experiences on production technology, quality control etc., where work experience is more important than their academic background. Generally speaking, Hong Kong-invested manufacturers employ a team of industrial technicians to manage daily production activities. Now, as more Hong Kong-invested manufacturers have shifted from the OEM model that focused on the assembly process to the ODM and OBM model, they need to strengthen the internal capacity in design and development of new products. Therefore, it is necessary to establish internal R&D team to build up core technological competence and develop products more efficiently. Ever since the Hong Kong government has begun promoting the development of innovation and technology, funding programmes for R&D talent have been introduced for tertiary institutions and the industry. The education and employment support in this area are gradually getting on track with wide support from the industry. However, the process of grooming industrial talents required by "re-industrialisation" still lags behind and needs timely catch up.

In this regard, FHKI advocates for three major directions in building the talent pool for Hong Kong's re-industrialisation:

- Strengthen the provision and recognition of applied subjects in the education system and construct articulation pathway
- Attract experienced industrial talent by utilising the Qualifications Framework and accreditation system
- Reshape the image of the modern industry with joint efforts of schools and industry

Besides, Hong Kong-invested manufacturers are also actively seeking to obtain the most advanced R&D findings from the researchers in universities and research centres to speed up scientific research and innovation in the enterprises. This part will be discussed in section 6.2.4.

I. Strengthen the provision and recognition of applied subjects in the education system and construct articulation pathway

Over the past few decades, due to the reduction of manufacturing jobs, the original vocational elements in Hong Kong's education system have also been gradually removed. There have been less technical subjects in secondary schools where students are guided to focus on literature subjects and coping with public exams. Vocational and technical diplomas in applied subjects are often regarded as inferior to university degrees. However, advanced manufacturing requires a large number of technical professionals with vocational training and hands-on experience of industrial operations. In this regard, Germany, Switzerland and Singapore etc. have adopted dual degree programs. In addition to traditional academic degrees, students can choose more practical applied degree courses based on their interests, which allows them to study and work in internship positions at the same time. This system supplies sufficient industrial talents who are knowledgeable and work-ready for the development of advanced manufacturing in these countries.

Therefore, FHKI recommends that more courses related to advanced manufacturing should be provided across secondary school, apprenticeship schemes, diplomas and degree programmes, with industry's participation to strengthen the credibility of applied subjects across the board:

- Encourage colleges and universities to offer a larger variety of Applied Degrees, including degrees funded by the University Grants Committee (UGC)[84] and self-financing degrees. Courses related to modern industry, such as artificial intelligence, data science, advanced production technology, robotics, etc., should be included into the funding scope of the Study Subsidy Scheme for Designated Professions/Sectors (SSSDP) to encourage self-financing institutions to develop more applied degrees. This will allow secondary school students to choose from more comprehensive and diversified study fields, as well as provide clear pathways for vocational diploma graduates to pursue further studies. The government should also consider that institutions offering courses related to modern industrial technology should obtain additional funding to procure machinery or equipment for teaching purposes.
- Industry and colleges should be subsidised to jointly organise dual education programmes with reference to the mature systems in Germany and Singapore. The programmes integrate classroom learning and internships for students to accumulate work experience and earn remuneration. This also allows the industry to systematically participate in the training of young industrial talents and alleviate the shortage of manpower.
- Increase the quota and subsidy for the existing Apprenticeship Training Scheme and "Earn and Learn" Scheme, and include more courses relating to high potential industries that are lack of technical talents (e.g. food processing, environmental industry,

84 The Education Bureau (EDB) launched the Pilot Project on the Development of Applied Degree Programmes in December 2020. EDB invited institutions with at least three years' experience in offering self-financing degree programmes under the Study Subsidy Scheme for Designated Professions/Sectors (SSSDP) to express interest and submit proposals for taking part in the Pilot Project. The selected institutions will be invited to modify the programme structure and curriculum of an existing degree programme with a strong industry element in a discipline with keen manpower demand, with reference to the coverage of the SSSDP. Subject to the satisfactory completion of relevant accreditation, the selected institutions are expected to launch the applied degree programmes in the 2022/23 academic year at the earliest. The qualifications of applied degrees should be equivalent to those of conventional academic degrees (i.e. to be pitched at Qualifications Framework Level 5). Other relevant factors such as achievements in Applied Learning subjects, skills-based competence and achievements, working experience will also be considered during admission. (https://www.info.gov.hk/gia/general/202012/10/P2020120900853.htm)

innovation and technology, computer applications). This also encourages the industry to participate and attracts students to sign up for the programmes.

- Strengthen the credibility and participation of "applied learning subjects" in secondary schools. At present, the highest score in Applied Learning Subjects in HKDSE is "Attained with Distinction (II)", which is only equivalent to Level 4 of other Senior Secondary Subjects, undermining the value of applied learning courses. Under these circumstances, students are less motivated to pursue applied learning subjects because the grades are unfavourable for further studies. It is recommended that the assessment grades of Applied Learning subjects should be aligned with typical Senior Secondary Subjects. Colleges and universities should be encouraged to consider Applied Learning subjects as one of the admission references to attract students.
- Promote business-school collaboration and jointly develop the curriculum and content of the "Engineering and Production" applied learning subjects (including constructing smart cities, electrical and energy engineering, and tech basics). For example, elements of product manufacturing management, production networking technology etc. can be included to the curriculum so that secondary school students have an early understanding of advanced manufacturing.
- Broaden the coverage of "STEM Internship Scheme" to manufacturing-related disciplines and associate degree students of locally-accredited full-time STEM courses, so as to attract young people to join the innovation and technology industry and manufacturing industry.

II. Attract experienced industrial talent by utilising the Qualifications Framework and accreditation system

Besides training young graduates, Hong Kong should formulate policies for the accreditation and attracting of experienced industrial talents to aid the industry in hiring veteran technicians in the short-run for re-industrialisation; as well as to promulgate the continuous professional development for advanced manufacturing industries:

- Open up the talent market to attract industrial talents (such as engineers and technicians) from the Mainland China and abroad to Hong Kong and rebuild the foundation of local industrial talent pool. The government should expand the existing talent attraction schemes to include technicians with many years of experience but without university degree, and regularly review and update the talent list under the Quality Migrant Admission Scheme[85] based on industry needs.
- Provide engineers in the industrial sectors with professional qualification certification to establish a professional image and attract students to enter the industry; and develop a continuous professional development mechanism to help the industry maintain professionalism.
- Fully utilise the Qualifications Framework and its "Recognition of Prior Learning" mechanism for the accreditation of experienced technicians that allows them to pursue higher education, such as obtaining bachelor or higher degrees and continuing education.

85 In June 2021, the Talent List Hong Kong featured 11 professionals including waste treatment specialists, asset management professionals, marine insurance professionals, actuaries, fintech professionals, data scientists & cyber security specialists, innovation and technology experts, naval architects, marine engineers & superintendents of ships, creative industries professionals and dispute resolution professionals & transactional lawyers.

III. Reshape the image of the modern industry with joint efforts of schools and industry

Without the presence of production lines in Hong Kong, both students and the general public have less exposure to advanced manufacturing and the entire modern industrial system. In order to draw public support to the re-industrialisation in Hong Kong, the Government must start with building up a positive impression of advanced manufacturing and enhancing understanding to the socio-economic benefits of this industry. FHKI recommends that the government promote closer cooperation between businesses and schools to organise extra-curricula activities relating to advanced manufacturing and include contents relating to the modern industry into teaching materials, so as to help students understand how industry and technology are closely related to our daily life. Industrial technical talents and vocational professionals should also be encouraged to participate in competitions and exhibition activities such as the "World Skills Competition" to help the public establish a more concrete and positive impression towards the modern industry and the spirit of craftmanship.

6.2.3 Support specific industries with Government procurement

SMEs are indispensable and important members of the regional industrial system. Because of their relatively small scale, they must form a complete industrial chain by complementing each other, so as to build an ecosystem for the joint development of the manufacturing industry and producer services. Many governments cause funds to flow into the market and simultaneously facilitate the development of SMEs in specific industries by strategically employing public procurement policies that are beneficial for SMEs to tender **(see section 5.3)**. However, under the existing government procurement policies in Hong Kong, it is difficult for SMEs to compete with large scale manufacturing corporations with their very limited resources.

FHKI recommends the government to further review its procurement policies to provide local manufacturing SMEs with more business opportunities, and to encourage them to invest in advanced manufacturing and upgrading traditional operations:

1. **Invoke negotiation exemptions under the "WTO Agreement on Government Procurement":** The Government should maintain public procurement as a tool to guide the flow of resources and actively negotiate for exemptions under the WTO Government Procurement Agreement. The Government should reserve the right to use any form of intervention to promote the development of SMEs through public procurement; Especially, selected industries should be added to the list of exempted entities, and the government can prioritise the procurement of locally produced recycled and reused products with aim of sustainable social development.

2. **Set out a target ratio of public procurement from SMEs:** Making reference to other economies, the Government should require public institutions to provide SMEs the opportunity to take part in procurement, and the target proportion of SMEs procurement should reach at least a certain target level, such as 50% of the total procurement volume. Payment mechanisms that can ease the SMEs' financial pressure should be implemented; and a product list should be formulated with SMEs associations for which only bids from SMEs would be accepted.

3. **Increase public green procurement:** The green procurement list should be broadened with increased budget for government departments to procure green products. Also, specific green standards and target procurement ratio should be set out for locally recycled and reused resources, so as to provide environmental manufacturers with specific guidance to follow through. The government can also pilot subsidy schemes to fund private organisations to purchase locally-made green and recycled products.

6.2.4 Improve industry support measures and formulate "re-industrialisation" performance indicators

Hong Kong has always adhered to the governance principle of "big market, small government" and free market economy. However, compared with the mainstream financial industry and consumer service industries, Hong Kong's re-industrialisation requires considerable investments and long time for return of investment. Policy support is pivotal to initiate industrial development. Economies that are undergoing "re-industrialisation" or promoting advanced manufacturing industries (including China, the United States, and Singapore, etc.) all have rolled out diverse policies to benefit industrial development. The Hong Kong Government needs to adopt more proactive approach and review existing industrial policies or regulations that were made for traditional, labour-intensive manufacturing activities. This will lead to the gradual establishment of core competence and a facilitative industrial ecosystem that is favourable for re-industrialisation.

I. Industrial land planning

Hong Kong's industrial land covers an area of about 27 square kilometers, which is about 2.4%[86] of the total land in Hong Kong. At present, industrial land is generally divided into general business uses (traditional manufacturing, warehousing and other industrial lands) and special industry uses (industries with strict requirements on environment or work tools, such as higher loading, higher ceiling, larger floor plate, back-up power supply and cleanroom environment). The latter land use, which is required for advanced manufacturing, is expected to reach a shortage of 70 hectares in 2033, while the shortage of the former land use is 38 hectares[87]. When promoting re-industrialisation, the government must ensure a sustained supply of industrial land for advanced manufacturing industries with factory space that meets their needs.

Moreover, most of the existing industrial buildings were built in the 70s to 80s where the facilities can hardly meet the operational requirements of advanced manufacturing. In 2000, the Government initiated the revitalisation of old industrial buildings completed before 1987. Most of the successfully revitalised industrial buildings have been renovated into commercial buildings, shopping malls or hotels etc., and the floor space for industrial use has continued to shrink. FHKI believes that for the long-term development of Hong Kong's re-industrialisation, the Government must preserve existing industrial land as much possible, and at the same time conduct thorough planning to increase supply in new development areas in response to the needs of Hong Kong's manufacturing industry:

86 Land Utilization in Hong Kong 2019 prepared by Planning Department. https://www.pland.gov.hk/pland_tc/info_serv/statistic/landu.html.
87 Hong Kong 2030 Planning Vision and Strategy prepared by Planning Department.

- In early 2021, the Government launched a two-year pilot scheme for charging land premium at standard rates for redevelopment of industrial building, giving owners more certainty in land premium assessment with an aim to encourage redevelopment of old industrial buildings. However, the standard rate of land premium for "commercial/ modern industrial" uses is the same, and it can be expected that more owners will choose to rebuild old industrial buildings for commercial use. FHKI suggests that the Government should consider providing more attractive standard land premium (such as a further 30% discount) for redevelopment into new industrial buildings suitable for advanced industries, so as to encourage owners to preserve industrial buildings for industrial use.
- It is recommended to set up industrial parks or special-use industrial buildings for selected industries, with common facilities, infrastructure, emission systems, industrial support, logistics and transport facilities. Take the food industry as an example, factories generally require more land to install machines and the setting up of sewage treatment systems. In this regard, the Government can allocate land to set up industrial parks for centralised regulatory management. The park should allow factories to operate 24 hours a day and facilitate the loading and unloading of large trucks etc. to support traditional industries upgrade and transform.
- The recycling and environmental industry needs a large amount of land available for long-term lease to invest in large-scale machinery and equipment. For instance, the EcoPark at Tuen Mun opened in 2007 provides leasing term of up to 20 years. However, the EcoPark is already full and thus the Government must look for new land for expansion as soon as possible, so as to encourage industry investment and strengthen local recycling capacity to tackle local waste disposal issues.

II. Facilitate technology transfer between the industry and institutions

The tertiary institutions in Hong Kong have rich scientific research outcomes, which are valuable resources for the high value-added development of the manufacturing industry in transforming academic knowledge into longer-term socio-economic value. Hong Kong-invested manufacturers reflected to FHKI that even though they actively approach universities to seek R&D collaboration opportunities, very few can eventually succeed in collaboration as technology transfer and industrialisation are not the priority for university faculties. FHKI advocates that the Hong Kong Government should commit to encouraging academic institutions and industry to cooperate in the R&D projects so that the funded research projects can be applied in the industry, and private enterprises would be more eager to invest in scientific research activities, forming a virtuous circle in technology transfer:

- When granting funds to universities' scientific research projects, the government and the Research Grants Council should designate part of the funds for the commercialisation of research outcomes in order to encourage investment into applied research and allow researchers to help solve practical technological challenges in the industry.
- The existing funding schemes should be optimised to encourage cooperation between universities and the industry in carrying out applied research projects. Researchers from related private companies should be allowed to use advanced R&D instruments and equipment in universities to promote technical exchanges between industry and academy.
- Since the patents generated by scientific research are owned by the universities instead of the researchers, the inventors do not receive much income through knowledge transfer. It is suggested that local universities increase flexibility in patent rights and

licensing policies as a financial incentive for scientific researchers to commercialise research outcomes, and thereby encourages R&D teams to carry out research projects with strong practicality and commercialisation potential.

- Currently, academic staff only has four days a month to practice off-campus. To facilitate exchange, regulations concerning the practice of R&D personnel outside schools should also be appropriately relaxed. For example, researchers should be allowed and encouraged to conduct knowledge transfer activities in industrial and commercial enterprises during weekends, public holidays and annual leave to help them master the technical needs of the industry and introduce the latest research results into the industry.
- Representatives from industrial and commercial enterprises should be invited to join the universities' technology transfer offices as consultants or steering committee members, so that they can share market needs and actual industry operations with the academic community and line up industry-academia cooperation and technology transfer opportunities.

III. Review factory licensing and certificate of origin requirements in light of the characteristics of advanced manufacturing

At present, the local manufacturing sector is developing towards small volume, high value-added and more producer service-oriented, which the nature and factory set-ups are very different from the labour-intensive manufacturing in the past. Therefore, FHKI suggests the government should make appropriate review and adjustments to the application procedures and requirements for "Factory Registration" and "Certificate of Origin", taking more proactive approach in seeking to understand the operations of advanced manufacturing enterprises and facilitate their license applications:

- The authority can understand latest production technology adopted by individual industries from the industry chambers and then determine whether the production procedures of the products comply with the principle of substantive processing, in order to optimise the approval procedures for the factory registration and certificate of origin. Consideration should also be given to the setup of an operation mechanism with the participation of Customs and Excise Department and the Government Laboratory to review the latest production processes and deal with the license applications of new products more efficiently.
- Provide more active assistance to advanced manufacturing companies, such as on-site visits to the applicant company and explaining how the production process can meet the standards and regulations, in order to facilitate the establishment of high value-added production lines in Hong Kong.
- Explore the possibility of classifying R&D costs as local production costs when calculating the certificate of origin. Edwin Vermulst, who has provided legal advice on the Rules of Origin for the European Union and different developing countries, published a study and point out that the US, the European Union, Australia, Canada and Japan have included R&D work to calculate the domestic content of their non-preferential and preferential "certificate of origin". The study pointed out that the above five countries include the production processes "incidental to" and "necessary for" the production, including indirect workers, depreciation, product research and development etc., as manufacturing overheads and part of the manufacturing costs[88].

88 "Production costs can be broken down in cost of manufacture and overhead costs. The cost of manufacture, in turn, can be divided into costs of materials, direct labor costs, and manufacturing overheads...Manufacturing overheads include all expenses incidental to and necessary for the production of the product, such as indirect labor, supervision, depreciation, production royalties, rent, power, maintenance and repairs, product-related R&D..." Rules of Origin As Commercial Policy Instruments?, Edwin A. Vermulst. https://www.vvgb-law.com/media/1024/vermulst-rules-of-origin-as-commercial-policy-instruments.pdf

IV. Appropriately relax the application requirements for government funding schemes

The Government has always maintained various funding schemes for encouraging R&D and technological applications. However, as many schemes can involve larger sums (for example, up to HK$15 million can be granted under the "Re-industrialisation Funding Scheme"), the approval processes are complicated and create heavy administrative burden on SMEs applicants. The overly cautious attitude of the authorities in assessing applications also creates extra hardship for applicants. FHKI advocates that authorities should review the application requirements of these funding schemes and consider relaxing the requirements appropriately for applications of smaller funding amount to facilitate SMEs using the funds for upgrade and transformation:

- Enhance the funding ratio of the "Re-industrialisation Funding Scheme" to 1 (government): 1 (enterprise). Modification or installation of automated processes to existing production lines should also be eligible for application, and express approval mechanism to be set up for small grant applications below HK$500,000.
- With reference to the establishment of Proof-of-Concept Grant and Technology Enterprise Commercialization Scheme in Singapore, funding scheme for supporting small-scale research projects of less than HK$1 million for SMEs should be set up and applicant companies are allowed to cooperate with non-local scientific research institutions;
- The "Technology Voucher Programme" under the Innovation and Technology Commission is popular among SMEs. The authority may make reference to the Guangdong Technology Voucher Application Platform to pre-approve qualified service providers and pre-approve small grants to eligible companies to allow them to conduct service transactions on the technology voucher platform, thereby reducing the time required for the application process.
- The Government's overly cautious attitude in approving funding applications has discouraged many companies who worry that they would not be able to meet the requirements of the authorities. The authorities should adopt a more lenient and tolerant attitude[89] in funding assessments, letting more innovative technology experts and industrialists participate in funding approval to give specific suggestions on technological innovation and market acumen to applicants.

V. Formulate cross-department implementation plans for "re-industrialisation" and performance indicators

Due to the fact that "re-industrialisation" involves multiple policy areas from economic development, R&D, education, talent admission, land supply to financing, FHKI is of the view that the government should formulate cross-department development roadmaps, implementation plans and performance indicators to help review the progress of each policy area. The government can formulate five-year plans according to the trends of specific industrial data, and to promote the local industrial output value to reach a certain targeted proportion of the

89 The government's "no-failure" mentality is particularly unveiling in the approval of innovation and technology funds. Respondents indicated that the government requires innovation and technology companies to provide successful cases of related technologies as reference. The application was eventually rejected as the start-ups cannot submit sufficient application experiences for its new technology.

GDP. At the same time, through the statistical revision of economic data mentioned in Section 6.1, the needed data of the producer service industry can be collected and analysed to help understand the value of manufacturing to the overall economy more comprehensively.

In addition, keeping track of and evaluating industrial development ecology is instrumental for policy making. Therefore, it is suggested that the government, together with relevant industrial support organisations, to design the Hong Kong Re-industrialisation Development Index to provide valuable data for the formulation and enforcement of re-industrialisation policies.

6.3 Strengthen producer services to become the hub of regional manufacturing development

Hong Kong has always been Asia's financial and trade centre, possessing a mature international business network and extremely favourable conditions for becoming the core of manufacturing production value chain in Asia. Using the GBA and Southeast Asia as bases for mass production and fully utilising its advantages as a knowledge-based economy with profound manufacturing foundations, Hong Kong is well-positioned to provide upstream and downstream producer services (including scientific research, design, procurement, logistics and trade, sales, financing and insurance etc.) as well as advanced manufacturing procedures, which are the highest value-added economic activities along the production chain. Moreover, by taking advantage of beneficial policies such as the "14th Five-year Plan" and RCEP, Hong Kong can lead the development of the manufacturing sector in the region by transferring innovations and technical know-how to upgrade manufacturing activities within the region, and will ultimately usher in a new era of Hong Kong's industry.

6.3.1 Strengthen Hong Kong's role as an international innovation and technology centre in the GBA

Hong Kong has been positioned as the GBA's international innovation and technology centre under the "14th Five-Year Plan", with research focus on medical technology, big data and AI, robotics, new materials, micro-electronics and fintech. FHKI is of the view that Hong Kong should seize this opportunity by actively strengthening the innovative abilities of selected industries and streamlining policies with the rest of GBA to allow seamless integration of scientific research activities, movement of talent, protection of intellectual properties, product standards, trading and professional services etc. These measures will allow cooperation between the scientific research teams from Hong Kong and the Mainland to achieve technological breakthroughs and the commercialisation of research outcomes.

- Due to the fact that Hong Kong-invested manufacturers are active in R&D in the Mainland, the government should accordingly formulate more comprehensive strategies to assist Hong Kong-invested manufacturers in the Mainland in facing challenges such as talent acquisition and cross-border R&D cooperation **(see section 4.3 for details)**, and thereby to promote the high-tech development of local producer services.

- Due to the small market size in Hong Kong, Hong Kong-invested manufacturers must expand their businesses to the GBA in order to broaden application scenarios and enjoy a large-scale consumer market to support the commercialisation of scientific R&D results. The GBA market is instrumental to improve the survival rate of new products and enable the continuous development of Hong Kong's re-industrialisation. For this, FHKI urges the Government to actively negotiate with other GBA cities on the integrated policy for the free flow of manufacturing personnel, goods, scientific R&D and production elements in the GBA. A unified coordination mechanism shall be established for the movement of professionals, customs clearance standards and various trade-related systems (such as taxation and commercial mediation systems). In-depth research on the legal implications of cross-border data application in the GBA should be carried out to seek for earlier release of more big data that is beneficial to the development and application of the industry, such as customs statistics, cargo flow and types, and product quality and safety statistics etc..
- In order to achieve "China Standards 2035", provincial and municipal governments provide incentives to encourage enterprises to invest in the standard-setting of various high-tech industries **(see section 5.2 for details)**. The Hong Kong Government should also incentivise local R&D teams to take standards setting as an important benchmark for their R&D achievements, thereby strengthening the synergy between Hong Kong and other GBA cities;
- As an important node connecting the GBA with the world market, Hong Kong has the essential qualities to become a product testing and certification centre to assist GBA and overseas corporations to meet various product specifications requirements and certification standards. With a comprehensive and internationally acclaimed certification system, Hong Kong has 228 accredited laboratories, 26 accredited certification bodies and 22 accredited testing institutions as of May 2020. All conformity assessment bodies accredited by Hong Kong Accreditation Service can also obtain international recognition through mutual recognition agreements[90]. Hong Kong can help companies in the GBA and overseas to align product specifications and certification standards for various markets.
- It is recommended that the Government discuss with relevant Mainland authorities to jointly establish safety and testing standards for goods sold in the GBA, especially in food, Chinese medicines, toys and electronic products etc., which are mutually recognised and in line with international standards. Joint laboratory can be set up to provide testing and certification services. Qualified products can pass the customs clearance through the green channel with reduced spot checks, helping Hong Kong-made products enter the domestic market and strengthening the advantage of setting up high value-added production lines in Hong Kong.

90 Mutual Recognition Agreement is recognised by accreditation bodies in more than 100 economies, including China, Japan, South Korea, ASEAN, Australia, New Zealand, EU, the US and multiple Belt and Road countries. Details are as follows: https://www.itc.gov.hk/ch/quality/hkas/information/mra_mla_arrangements.html

6.3.2 Strive for a leading position in the Asia's manufacturing production chain

As the manufacturing in the Mainland is transforming towards high-tech directions, labour-intensive manufacturers are beginning to set up production lines in Southeast Asia instead. In addition, the implementation of RCEP will also gradually eliminate trade barriers across the region. It is anticipated that manufacturing activities in Asia will substantially increase, with stronger cooperation between economies in different parts of the production chain. As the gateway between the GBA and the world, FHKI recommends the government to step up its effort to assist Hong Kong-invested manufacturers to seize the opportunity and to strive for an advantageous leading position in the production chain of Asia:

- Last year, the 15 Asia-Pacific countries signed the "Regional Comprehensive Economic Partnership" (RCEP), covering 30% of the world's population and many emerging Asian markets with increasing consumption power. The Partnership is expected to boost trade volume in the region and build a complementary manufacturing supply chain **(see section 3.2.2 for details)**. Although Hong Kong has free trade agreements with many RCEP signatories, it does not have free trade agreements with Japan and South Korea yet. FHKI supports the Hong Kong government to actively strive to join RCEP and take advantage of the complementary supply chains of China, Japan and South Korea to help Hong Kong-invested manufacturers develop toward the upstream of the supply chain and procure components and parts from more diverse sources. In addition, business personnel in RCEP signatories are expected to enjoy more visa convenience and preferential treatment, which is an important and convenient measure for Hong Kong-invested manufacturers that intend to send staff to develop production lines and sales markets in ASEAN countries.
- Southeast Asia is an important production base and market along the Belt and Road. Although many Hong Kong-invested manufacturers have adopted "China+1" strategy **(see section 4.1 for details)**, they still encounter obstacles that can only be resolved on the G2G level. FHKI recommends that the Government can introduce targeted measures, such as improving the existing subsidy schemes, introducing preferential loans and insurance, and fighting for subsidies and policies from the Central Government to support Hong Kong-invested manufacturers establishing in overseas economic and trade cooperation zones of ASEAN countries. Due to the comparatively low production efficiency of Southeast Asian workers, Hong Kong-invested manufacturers often need to invest in training skilled workers. It is suggested that the Government should negotiate with Southeast Asian countries that foreign-funded enterprises can obtain subsidies or tax reductions when they provide training for local workers. This will also help Southeast Asian countries improve the labour quality.

Chapter 6
Policy Advocacy

- Hong Kong has long served as a trading gateway between the Mainland and global market. The Government has also always encouraged companies to make use of national policies to open up new markets. However, the industry generally agrees that the Hong Kong Export Credit Insurance Corporation (HKECIC)'s products and insurance policies are too conservative for Hong Kong enterprises to reduce the risk of expanding the emerging markets. FHKI advises that HKECIC should review its positioning and strengthen commercial operations. In order to align with local trade policies, HKECIC may have to consider reviewing its risk appetite and roll out insurance products to better cover emerging markets and high-risk markets. HKECIC should assess the potential trade risks related to technological standards for different industries and introduce suitable insurance policies to help Hong Kong-invested manufacturers reduce the risks of trading with new markets.
- The "Made in Hong Kong" brand has always been a quality guarantee trusted by international brands and consumers, regardless of whether it is produced in the Mainland or Southeast Asia. This reputation is extremely important for Hong Kong-invested manufacturers to open up the market and worth the Government's investment for further promotion in order to create business opportunities for Hong Kong-invested manufacturers. FHKI recommends the Commerce and Economic Development Bureau to work in consortium with the Hong Kong Trade Development Council and chambers of commerce to formulate a trade promotion strategy for the "Made by Hong Kong" brand in the GBA, the ASEAN region and other emerging markets, including online and offline marketing presence, exhibition opportunities and showcase on e-commerce platforms. This can allow local SMEs with limited resources to tap into new markets with the help of brand effects. The Government can also make reference to Singapore's Business Sans Borders plan[91] to develop an online marketing platform for SMEs to connect with other trading platforms around the world to save corporate costs for digitisation and cross-border trade.

91 Business sans Borders achieves successful proof-of-concept to enhance SME access to trade opportunities. Monetary Authority of Singapore (11th November 2019). https://www.mas.gov.sg/news/media-releases/2019/business-sans-borders-achieves-successful-poc-to-enhance-sme-access-to-trade-opportunities.

Appendix 1
Summary of focus group discussions

In October 2020, the research team held four focus group discussions to understand the business strategy and development direction adopted by Hong Kong-invested manufacturers and the challenges and opportunities therein.

"China +1"

While Hong Kong-invested manufacturers maintain production lines in the Mainland, they also set up factories in Southeast Asia to reduce operating costs and risks. Respondents are mainly engaged in the toy, electronics and textile industries. Among which, two toy companies also manufacture electronic products including electronic toys. Therefore, the respondents of this focus group broadly covers labour-intensive industry, technology-intensive industry and the hybrid of both. Most of them established factories in Southeast Asia only in recent years.

1. Common challenges:

- The increase in labour costs in the Mainland and the increase in the minimum wage level;
- Shortage of workers and challenges in recruitment in cities where most Hong Kong-invested manufacturers set up their factories;
- Tightened environmental requirement in the Mainland in recent years have increased compliance costs;
- Tariffs imposed by the US on China's imports under the trade dispute;
- Customers require companies to adopt the "China +1" strategy.

The above conditions have shrunken the profit margins of companies. Therefore, some of them establish new factories in other places to reduce operating costs and avoid tariffs imposed by the US.

2. Labour-intensive industry respondents are more active in adopting "China +1", followed by semi-labour-intensive companies, while technology-intensive manufacturers such as electronics or household goods are less inclined to adopt this strategy:

2.1 Reasons of labour-intensive industry respondents being more active in adopting "China +1":

- Since labour costs account for a high proportion of overall operating costs, reaching 40-50%, there's significant benefit of setting up factories in countries with lower labour costs;
- The manufacturing processes involve less high-tech machinery and equipment, hence the initial capital investment for establishing new factories overseas is relatively low.

2.2 Reasons of technology-intensive manufacturers being less inclined to adopt the "China +1":

- Labour costs account for less than 10% of overall operating costs, the effect of establishing new factories overseas to reduce costs is less significant;
- The entire production line consisted of a lot of automated machines, the design and installation cost can be as high as hundreds of millions of Hong Kong dollars;
- Most products are on the exclusion list of Section 301 Tariff and alternative suppliers cannot be found in a short period of time, it is easier for their customers to obtain US exemptions on tariff.

3. Target destinations for textile and toy companies adopting "China +1" strategy:

3.1 Low labour costs and stable supply are the primary considerations. Respondents mostly choose Southeast Asian countries to establish their factories, such as Vietnam, Thailand, Cambodia, Myanmar, the Philippines and Malaysia.

3.2 The second consideration is geographical location. Southeast Asian countries have certain advantages in terms of logistics, production chain, risk control and ease of management:

- Logistics and production chain: Respondents said that most of the raw materials still have to be supplied from the Mainland to fulfill customers' standard requirements. Since Southeast Asian countries are close to China with accessible water and land channels, it is easier to manage logistic costs;
- Risk control: Due to the proximity, it is easier for companies to keep track of the operating status of local factories. Some Southeast Asian workers, such as those near Guangxi, can speak Cantonese or other Chinese dialects. It is easier to communicate with workers and hence lower the risks in factory management;
- Management: The transportation time to and from Southeast Asian countries is within 24 hours, which is more convenient for managerial personnel to visit the factory to supervise operation, provide technical advice and conduct staff training.

3.3 Respondents believe that the Southeast Asia is a better choice over South America (such as Mexico) for Hong Kong-invested manufacturers as they pursue global markets. South America is more suitable for those focus on the North American market.

4. Considerations and strategy for textile and toy companies to set up factories in the above-mentioned countries:

4.1 Two to three respondents pointed out that they tend to set up factories in more remote towns, preferably with about 500,000 population within 20 kilometers of radius or about 50,000 population close by so as to ensure the stable supply of 3,000 to 4,000 workers.

4.2 Benefits:

- The wage level is lower than that of Guangdong cities;
- The trade union culture is not as prevalent as in big cities;
- With abundant and stable labour supply to carry out the "three shifts" system and reduce the cost of overtime work.

4.3 Considerations:

- Technicians lack experience and training investment is required;
- Productivity is generally about 30% lower than that in the Mainland;
- Factory site must be accessible to a well-established port with stable freight schedule;
- Most respondents are not inclined to enter the industrial park because of the fierce competition. Most of those in industrial parks are larger companies, and the rent is relatively high;
- Special case: Due to public security and corruption problems, some companies entering the Philippines tend to settle in industrial parks even though the rent is about 50 to 70% higher than those outside, where they can get rid of the said issues.

5. Challenges faced by the textile and toy industries in adopting "China +1" strategy:

- The productivity of workers in the Mainland is relatively higher. The respondents mentioned that only Thailand workers are as efficient as the Mainland workers. The Philippines and Vietnam are 60% to 70% compared with Dongguan; while Indonesia can reach about 80%;
- Companies must stay cautious to political dynamics. If the relationship between the country and China becomes tense, companies may face tariff increase at any time;
- Compared with RMB, the exchange rate of Southeast Asian currencies against USD fluctuate greatly. Therefore, companies have to face higher foreign exchange risk.

6. Special strategy in response to China-US trade dispute:

- The China-US trade dispute and rising production costs in the Mainland China have forced manufacturers to set up additional factories in Southeast Asia to distribute the supply chain and reduce risks;
- In response to the China-US trade dispute and additional tariffs, Hong Kong-invested manufacturers have no tax concessions for exports from the Mainland to the US, which greatly reduces their cost competitiveness. Some Hong Kong-invested manufacturers and the US importers divide their labour by relocating some of the manufacturing processes to the US or regions that have received preferential tariffs from the US in order to acquire the "made in USA" label for export and domestic sales.

6.1 Division of labour between the Mainland factories and overseas factories:

- Factories overseas mainly carry out labour-intensive production processes while factories in the Mainland are the R&D bases to provide technical support and technical training for the production lines overseas.

6.2 Strategies adopted by the electronics industry or non-labour-intensive companies:

- Faced with the uncertainties of the China-US trade dispute, some respondents set an upper limit to the US orders to manage risk, for example, by controlling the total sales value of US orders within 10% of the total sales value;
- Expanding new sales markets, such as riding on China's dual circulation strategy to increase the proportion of domestic sales;
- Settling in overseas industrial parks in accordance with the national policies.

7. Policy advocacy:

7.1 Some respondents pointed out that the Singapore Government actively promotes manufacturers to set up factories overseas where industrial parks are established overseas in a government-to-government (G to G) manner. Customs and banks are set up inside industrial parks, so that manufacturers can enjoy preferential treatment and administrative convenience. It is hoped that the Hong Kong Government can take similar measures for Hong Kong-invested manufacturers.

7.2 In recent years, Hong Kong-invested manufacturers with establishments in the Mainland have mostly resorted to Mainland policies for overseas investment. At present, the Mainland Government hopes to relocate low value-added industries to address labour shortage and free up resources for the development of high value-added industries. Therefore, local governments in the Mainland are active in negotiating with overseas governments about the relocation of factories and strive for preferential treatment.

8. After the COVID-19 outbreak, the respondents stated that many counterparts have postponed their plans to set up factories overseas and avoided choosing locations with poor pandemic-control performance, such as India.

Upgrade and transformation

The production bases of these companies are typically located in the Mainland and maintain competitiveness through R&D and innovation. Most of them are technology-intensive companies that manufacture high value-added products to cope with cost competition. Most of the respondents are engaged in automation technology, while some others are engaged in electronics, furniture, moulds, plastics, toys and environmental industries.

1. The timing to start R&D investment of respondents:

- Most of the respondents, especially the environmental and electronics industries, have always set up R&D departments and invested resources;
- A respondent stated that its innovation and R&D centre is located in the Mainland where its customers were mainly downstream manufacturing companies in the past. As his customers moved out of the Mainland after the enforcement of the Labour Contract Law, the company began developing online sales and order management systems to continue its business.

2. The motivation of conducting R&D:

- OEM businesses usually conduct research to design suitable production plans that meet the cost requirements of customers;
- Since the competition in the Mainland market is fierce with rampant plagiarism, manufacturers have to invest into R&D to speed up the launch of new and unique products to gain market share;
- Environmental and electronics industries are R&D-intensive by nature where core technologies are instrumental in maintaining competitiveness.

3. Difficulties in conducting R&D and innovation in Hong Kong:

3.1 Human resources:

- The cost of hiring talents in Hong Kong is higher than that in the Mainland;
- The turnover rate of Hong Kong researchers is high, and they usually only stay in the same job for two to three years.

3.2 Industry-Academia-Research Collaboration:

- R&D cycle of new products to market is approximately only 6 months, while the R&D projects in universities usually takes 2 to 3 academic years to complete. Moreover, universities focus on basic research that are very remote to market needs;

- In order to avoid conflicts of interest, university professors in Hong Kong are reluctant to conduct joint R&D projects with commercial partners. Respondents pointed out that Germany is more successful in technology transfer and it allows university professors to receive income from both teaching and commercial collaboration projects, which is rarely the case in Hong Kong;
- Compared with the Mainland Government, the Hong Kong Government provides insufficient equipment support and subsidies to the industry.

3.3 Cross-border R&D collaboration between the Mainland and Hong Kong:

- Respondents suggested that R&D collaboration is conducted between Shenzhen and Hong Kong, but there are issues in customs clearance and tariff for small batches of research samples or materials;
- There are currently no companies or institutions that specialise in the customs declaration of such materials. R&D progress is obstructed as it is time-consuming and costly to arrange logistics for samples and test materials across the border.

4. Difficulties in conducting R&D and innovation in in the Mainland:

- Respondents indicated that the patent protection to enterprises is unclear in the Mainland. There's possibility of R&D employees taking away the patents they obtained at work after resignation;
- The Mainland's R&D capabilities are stronger than those of Hong Kong and the time required is shorter. However, companies usually lack sufficient support in background research when they apply for patent protection in Europe, which impairs their intellectual property rights.

5. Experiences of manufacturers:

- Talent development: A manufacturer built up internal development programme for its engineers with specific training and career progress plans. The engineers in the company set up a R&D community to exchange and learn from each other. Also, the company recruits new staff every year for the succession of R&D knowledge and experience;
- Cross-sector Collaboration: A manufacturer assigns R&D leaders to design and develop courses with universities to train talents needed by the industry. The R&D direction of the company was also introduced as the topic for final year projects.

6. Policy Advocacy:

- The Government should actively promote collaboration among industry, academia and research sectors, and encourage university professors to engage in joint R&D with the industry by revising the assessment criteria of the University Grants Committee;
- Provide R&D units in the Mainland China and Hong Kong with a green channel for the customs clearance of small batches of scientific research samples or materials;
- Encourage universities to allow private companies to use R&D instruments and equipment in the university;
- The government should fund the establishment of a scientific research equipment platform for companies with fewer resources to carry out innovation or scientific research;

- Some respondents pointed out that one of the biggest considerations when investing in innovation and scientific research is the predictability of policies. The Government should ensure the smooth operation of "One Country, Two Systems" so that companies are willing to make long-term investment;
- Some respondents hope to enhance exchange among industrial estates companies for joint innovation.

"Business Repositioning"

Manufacturers maintain production lines in the Mainland and shift the market focus from Europe and the US to the Mainland and Southeast Asia. Most of the respondents are engaged in automation technology, while some others are engaged in electronics, furniture, moulds, textile, toys and environmental industries.

1. **The discussion found that "repositioning" is not just the shift in sales market. Instead, manufacturers have to extend its services from just manufacturing to the other upstream and downstream producer services according to the needs of their customers.**

2. **Considerations of respondents in market positioning/repositioning:**

2.1. Since individual markets limit the scale of production, there is a necessity to expand businesses globally:

- Automobile parts: Most automobile parts are designed for a certain type of car, and the number of sales of a single type of car is probably only a few hundreds of thousands. Hence, usually automobile parts manufacturers target global markets across Europe, America, Southeast Asia or the Mainland.
- Textile industry: Respondents revealed that the scale of China's textile industry accounts for more than 50% of the global market. With this scale, products are exported to all parts of the world and the market is huge;
- There are respondents that produce heavy-duty machines, which are highly customised for small-scale production, with the local market and the Mainland as the main sales markets.

2.2. Manufacturers must provide different products based on consumer culture:

- Most respondents believe that European, American and Southeast Asian markets have different consumer cultures. European and American consumers tend to pursue quality and don't mind paying premium for high-quality goods; On the other hand, consumers in Southeast Asia and Asia are mostly looking for the price-performance which are cheap but in high-quality.

2.3. Markets are shaped by policies where manufacturers are playing a passive role:

- In the early years, the automobile parts industry faced trade barriers from different countries, such as protectionism in Japan, Europe and the US. Therefore, manufacturers established production lines in Europe and America to gain easy access to the local market. The industry commented that ASEAN countries have neither drawn out a blueprint for the automobile industry nor introduced the market to foreign investors. The unclear development pathway discourages them from setting up production lines in ASEAN;
- The toy industry, on the other hand, faces protectionism in countries such as Indonesia and India. Toys must be tested locally before they are imported, but the standards are often unclear. The goods are sometimes detained by the local customs for non-

compliance with the inspection regulations, which hinders foreign manufacturers from selling products there;

- The textile industry revealed that fluctuations in the supply and demand of raw materials led to trade instability. Under the China-US trade dispute, the US imposed a ban on the import of products with "Xinjiang cotton". However, Xinjiang cotton accounts for about 50% of the total domestic supply, forcing the industry to procure from other countries;
- Respondents pointed out that some Southeast Asian countries, such as Bangladesh and Vietnam, have strong favouritism to domestic SMEs. If Hong Kong-invested manufacturers intend to set up there, they must establish a joint venture with a local company in order to meet compliance requirements and obtain approval.

2.4. In the post-COVID-19 period, manufacturers can use the local Hong Kong market as a starting point for brand building:

- The pandemic has stimulated the Hong Kong industry to develop a remote business model. Revenue of companies engaged in digital solutions has increased;
- Respondents revealed that products sales improved in local neighbourhoods despite decline in tourist areas. The strong local consumption power opens up new market for local brands;
- As a cosmopolitan city, Hong Kong's consumer tastes can be considered a trendsetter for the global market. Therefore, companies may consider establishing a brand with Hong Kong as a starting point, and then develop the Mainland and overseas markets with the reputation of Hong Kong brands.

3. Difficulties in the domestic sales of products originally designed for export:

- Difficult to collect payment: Respondents encountered long collection periods and difficulty in collecting payment on domestic sales. When expanding domestic market, respondents indicated that they intend to cooperate with relatively credible regional governments or enterprises to ensure the payments can be recovered;
- High cost of 3C license application: Cost of 3C licenses in the Mainland for each type of product varies. If the product involves 4G or 5G technology applications, the licenses can cost RMB 500,000 to 1 million, whereas similar license only costs a few thousand dollars in Hong Kong;
- Respondents in the textile industry pointed out that the consumer preferences and pursuit of consumption experience in the Mainland is vastly different from those in the traditional European and US markets. At present, the use of Internet celebrities for sales is popular in the Mainland, who can drive hundreds of millions RMB of daily sales. Therefore, companies must accurately use Internet celebrities to achieve targeted marketing and brand building in order to succeed in the domestic sales of products originally designed for export.

4. Develop upstream and downstream producer services:

- Respondents suggested that manufacturers will no longer rely on cost reduction as the selling point in the future. While global manufacturing enters the era of Industry 4.0, customers nowadays require manufacturers to provide high value-added services, such as optimisation of production management system to establish just-in-time production chain to reduce customer's inventory costs;

- In addition, companies can now predict product demands by big data analysis and purchase the right amount of materials for production. Through B2C business channels built on cloud technology, manufacturers can produce small batches of customised products and compress the entire production process from 60 days to 7 days through smart production methods;
- A manufacturer of environment engineering machinery have expanded its business to provide customers with manufacturing solutions and services, but have outsourced the manufacturing part to increase flexibility;
- To conclude, manufacturers will not only be responsible for the manufacturing and assembly processes in the future, but also to provide production-related services. The businesses of the manufacturing industry will cover a wider spectrum and blurs the boundary between the manufacturing and service industries.

5. Policy Advocacy:

- Optimising BUD Fund: BUD Fund currently approves funding applications based on standard ratios. However, the restrictions on the use of funding do not allow companies to allocate funds for upgrade and transformation flexibly. Respondents recommended that the authority to enhance the flexibility of utilising funds in the approved projects;
- Establishing mutual recognition for product quality across the GBA and Hong Kong: As 3C certification in the Mainland is expensive, it is particularly disadvantageous for goods produced in small quantities. Therefore, respondents suggested the Government to strive for a mutual recognition system for product quality and safety certification between Hong Kong and the GBA. Products that have obtained certification in Hong Kong are equivalent to obtaining 3C, and a green channel is established for such products (especially food and beverages) to facilitate entry into the GBA market;
- Respondents pointed out that it is difficult for individual companies to set up factories overseas alone and obtain favourable conditions from the local government. They expect the Government to negotiate with foreign countries in a G to G manner, and FHKI to organise business missions for exchanging with foreign economies suitable for investment, so as to obtain more preferential treatment for Hong Kong-invested manufacturers to invest or set up factories there.

Re-industrialisation in Hong Kong

Manufacturers maintain production lines in the Mainland, while moving some high value-added processes back to Hong Kong or setting up high value-added production lines for emerging industries in Hong Kong. Respondents are mainly engaged in automation technology, while some other are also engaged in electronics, food, automation, toys, textiles and environmental industries.

1. The current challenge of re-industrialisation in Hong Kong

1.1 Machinery and equipment industry:

- Since heavy machinery industries require large area of land and Hong Kong lacks technical talents, companies in automobile parts manufacturing and environmental engineering tend to only move their R&D centres from Shenzhen back to Hong Kong, while keeping the production processes in the Mainland factories or by outsourcing;
- These companies now focus on providing customers with complete production

solution or design of integrated production system.

1.2 Traditional industry:

- Take the toy industry as an example, the production chain involves a large number of production processes and it is difficult to move the entire production chain back to Hong Kong. Manufacturers only incline to conduct R&D in Hong Kong;
- Some of the more advanced garment manufacturers have introduced automated production and engaged in small-batch customised production in Hong Kong, while large-scale factories overseas are responsible for mass production in a complementary manner.

1.3 Respondents pointed out that the reputation and quality assurance of "Made by Hong Kong" is still an attractive selling point, which is a major incentive for companies to set up production lines in Hong Kong.

2. Challenges faced by food industry in setting up production lines in Hong Kong and policies suggestions:

2.1 Difficulties:

- Hong Kong's factories are relatively small, making it difficult to introduce large-scale automated machinery. In addition, SME manufacturers usually produces a variety of products in small quantities, so it is not cost-effective to adopt automated production;
- Manufacturers lack market information on solutions and production technology for their upgrade and transformation. The supply of technicians for food processing is also limited;
- The setting up of a centralised food factory requires complicated licensing procedures. For example, the company needs to apply for sewage treatment license and fire safety license from different government departments;
- If there is a residential area around the factory, it is difficult to implement a three-shift system due to concerns of nuisance and production efficiency would be significantly impeded.

2.2 Advocacy:

- With reference to the agricultural parks of the Agriculture, Fisheries and Conservation Department, the Government should consider to establish a food industrial park to provide tenants with technical support, centralised wastewater treatment, fire safety provisions, food safety labs, appropriate road design and surrounding facilities, allowing factories to operate 24 hours a day and providing cargo loading areas for large trucks;
- Making reference to the US administration, customs officers can conduct inspection in the factory before products are exported to the GBA. Certified products can go through a green channel to speed up custom clearance and reduce procedures, which will help Hong Kong companies expand the domestic market.

3. Challenges faced by environmental industry in setting up production lines in Hong Kong and policies suggestions:

3.1 Difficulties:

- Hong Kong's recycling industry is still in the inception stage of development. Material upcycling and processing manufacturing is immature where the industry's survival and capacity are at a relatively low level;
- The Government is less devoted in promoting recycling industries, and it is difficult to encourage long-term investment in the industry;

- There are not many courses on the environmental industry in colleges and universities. By contrast, in Germany, Japan and Taiwan, there are specialised training courses in product design, production line design, R&D of recyclable materials, waste-to-energy conversion etc;
- At present, the scale of the industry is relatively small, making it difficult to attract young people to join the industry. There is not much room for the career development of technicians and the turnover rate is high.

3.2 Advocacy:

- The Government should take the initiative in purchasing more locally produced recycled products to provide a solid market foundation for the recycling industry, helping to retain talents and create room for industry development;
- Establish industrial clusters to help the environmental industry cooperate with other industries.

4. Challenges faced by electronics industry in setting up production lines in Hong Kong and policies suggestions:

4.1 Difficulties:

- It is difficult to collaborate with academic sector. Respondents received no response even they have repeatedly contacted universities for discussions;
- A manufacturer of environmental-friendly vehicles indicated that there is very few technicians for automobile manufacturing in Hong Kong. The company attempted to apply for the Research Talent Hub, but the programme requires foreign talents to possess academic qualifications in high rankings universities and colleges. Most of the technical talents hired by manufacturers only have work experience and cannot meet the academic requirements.

4.2 Advocacy:

- Relaxing the academic requirements of talent attraction schemes so as to allow manufacturers to recruit technical professionals with abundant work experience.

5. Challenges faced by textile industry in automated production stage in setting up production lines in Hong Kong and policies suggestions:

5.1 Difficulties:

- There are not sufficient digital technology talents for the textile industry in Hong Kong. It is difficult to hire data analysts, programmers, colour management technicians and UX/UI designers.

5.2 Advocacy:

- Optimising the Reindustrialisation and Technology Training Programme (RTTP) to subsidise companies for technician training;
- Introducing new business models to revitalise traditional industries, so as to hire senior technicians in Hong Kong to encourage re-employment and pass on skills and experiences to more junior practitioners.

6. Other suggestions:

6.1 Establish industrial clusters: Respondents commented that the lack of land supply and industrial cluster planning is the major cause of inefficient local industrial development. It is advised that government policies should be more industry-oriented, where Government takes a more active approach in the building up industrial clusters for synergised development.

6.2 Small Factory Vision:

- Respondents suggested that Hong Kong should make use of the well-established logistics infrastructure and cloud technology to develop towards “Co-Factory” and smaller factories in the future;
- Cloud technology can connect idle machinery and equipment in different factories with a centralised system for sharing among manufacturers;
- This model may increase the logistic cost of materials and semi-finished products, but land and equipment resources can be used more effectively and hence is worth exploring the feasibility.

6.3 The impact of COVID-19 on the industry:

- Manufacturers of school meal boxes were hit hard by class suspension. They have increased investment in R&D to produce food products to enter the GBA market;
- Some industries benefit from the new demand arising from the pandemic with booming business performance. Manufacturers of automated equipment have doubled their business volume after the pandemic.

Appendix 2
Interview Report

Background

The FHKI Chairman's Committee convened a meeting in March 2020 to collect members' views on the draft outline of the research report. At the meeting, members suggested that in-depth interviews should be conducted to understand the industrialists' views on enhancing the long-term competitiveness of Hong Kong's manufacturing industry and prospects of re-industrialisation. After the meeting, the Committee designated the following traditional and emerging industries **(refer to page 124 for the list of companies interviewed)** as the subjects of the interview:

Traditional Industries	Emerging Industries
• Microelectronics • Food processing • Jewellery design and processing • Printing • Recycling	• Information and communications technology ("ICT") • Data analysis, big data application, IoT • Biotechnology, medical care • AI and robotics • New materials

From May to June 2020, FHKI Secretariat interviewed 19 companies in both traditional and emerging industries with the following topics:

1. Importance of manufacturing industries;
2. Industry prospect;
3. Promote industry development and break through obstacles;
4. Views on re-industrialisation;
5. Views on the cooperation between Hong Kong and the GBA
6. Roles of the Government; and
7. Expectations on FHKI.

1. Importance of manufacturing industries

Traditional industries

- The electronics industry is Hong Kong's largest merchandise export earner, accounting for 68.3%[1] of Hong Kong's total exports in 2019. As electronic products are becoming smaller in size, Hong Kong's electronic products must receive support from the advanced microelectronics to remain competitive in the global arena.
- In recent years, the cross-border trade in food products has grown steadily, making food safety a matter of great concern to global governments and consumers. As a "Food Paradise", almost all of Hong Kong's food supply is imported. But we are able to maintain top level of food safety standard consistently to earn the reputation of Food Safety Port. Food processing industry not only provides high-quality and reliable food for the local society, but also wins the confidence of foreign consumers with its image of top quality. It is an industry with huge development potential.
- Hong Kong is one of the major jewellery centres in the world. As one of the world's top jewellery exporters in terms of annual total export value, the design and craftmanship of Hong Kong's jewellery are highly recognised by international buyers. Hong Kong is also the destination for many Mainland tourists to purchase fine jewellery. International jewellery exhibitions are held in Hong Kong in every March, June, September and November, attracting tens of thousands of international buyers to Hong Kong to purchase quality jewellery products. This brings in a large number of high-quality business travellers for the tourism industry. The jewellery design and processing industry not only brings extensive foreign income, it also provides a gateway

1 HKTDC: Economic and Trade Information on Hong Kong (28th May 2020)

to showcase the soft power of Hong Kong to international tourists and brings benefit to tourism, retail and exhibition industries.

- Freedom of press and free flow of information lead Hong Kong to become one of the world's major printing centres. The printing industry is an indispensable industry to support other manufacturers (such as publishing, toys, food and cosmetics), in the printing of collatoral, labels, promotional items, catalogues, and even bills, monthly statements and new stock prospectus. Local printers are the best partners for customers who have high requirements on copyright or confidentiality, or who need small-volume printed matters in a short time.
- In 2017, the added value of the recycling industry in Hong Kong was HK$9.3 billion (0.4% of local GDP), with an annual growth of 10.8%, with a total of 44,080 employees in the same year (1.2% of total employment in Hong Kong). Hong Kong has a high population density and limited land supply, but still we have to deal with a large amount of municipal waste everyday with an over-reliance on landfill. Therefore, Hong Kong must develop green technology and environmental industries to expand local waste processing capacity to tackle the ever-growing waste challenge.

Emerging industries

- In recent years, Hong Kong has been active in promoting re-industrialisation. The Government encourages companies to adopt latest ICT to establish Internet of Things (IoT) and Internet of Service (IoS), linking machinery and equipment, personnel, processes and data in operating processes together to build capabilities in communication, monitoring, analysis and decision making. In this way, enterprises can operate in more flexible and automated manner in response to rapid market changes. ICT, AI and robotics, data analysis, big data application, IoT and new materials are the core technology fields for the re-industrialisation of Hong Kong.
- According to Deloitte Global, global health care expenditures are expected to grow at an annual rate of 5.4% from 2018 to 2022, which shows a significant increase when compared to 2.9% from 2013 to 20172. In particular, the increasing ageing population and those with chronic diseases will continue to drive demand for healthcare services and expenditures. In addition, with the COVID-19 outbreak around the world, consumers' demands for biotechnology, medical treatment and health-related products have increased. Hong Kong has strong scientific research background in biotechnology and medical care3 to help cope with an ageing global population and the surging need for new biomedical technology.

2. Industry prospect

Traditional industries

- The development of 5G applications, Industry 4.0 and the miniaturisation of electronic products will promote advancement of microelectronics industry.
- With the limited local demand, it is necessary for the food processing industry to develop the Mainland market. The industry expressed that the Government needs to be more active to help Hong Kong-invested food factories to enter the Mainland market. For example, by setting up the express customs channel to speed up clearance procedures of Hong Kong food products to Mainland and relaxing restrictions for the sales of Hong Kong food exports to the Mainland.

2 Deloitte. 2019 Global Life Sciences and Health Care Outlooks. https://www2.deloitte.com/content/dam/Deloitte/tw/Documents/life-sciences-health-care/tw-2019-LSHC-Outlook.pdf.

3 First, Hong Kong has excellent R&D capabilities. Shenzhen-Hong Kong cluster formed by the innovation and technology players across the cities was ranked as the second largest technology cluster in the world by the 2019 Global Innovation Index. In addition, Hong Kong has two outstanding medical schools, ranking among the top in the world in the field of clinical medicine by "ISI Essential Science Indicators". The universities in Hong Kong publish about 250 highly-influential biomedical academic papers every year.

- Europe and the US are important markets for the jewellery design and processing industry. While the overseas economy comes to a standstill under COVID-19 pandemic, the demand for luxury goods shrinks significantly. Nevertheless, the industry believes that the 400 million[4] middle class in the Mainland is the future market for the luxury jewellery businesses. As Mainland consumers are keen on online shopping, the industry believed that it is necessary to explore the Mainland e-commerce market.
- Consumers nowadays are more inclined to electronic books. The reduced printing quantity and declining sales are the two major challenges faced by the printing industry. As the Mainland's printing industry has more advanced technology and applications than the counterparts in Hong Kong, coupled with their extensive business network, it is difficult for the printing industry in Hong Kong to open up the Mainland market. In addition, the talent gap in printing industry in Hong Kong is severe. In this challenging environment, the industry attempts to explore related businesses (e.g. gift and premium) to expand its business opportunities.
- The recycling industry believes that policy changes will determine their business prospects. The industry hopes that the Government will soon fully implement measures for waste separation at source, recycling and levy schemes according to the "polluter pays" principle. The implementation of relevant policies will provide the industry with stable supply of wastes for processes to enhance the scale and efficiency of waste treatment. which can promote the application of the local waste treatment technology. It is also possible to build more innovative technology industries in Hong Kong by regenerating wastes into products that can be widely used in local markets.

Emerging industries

- With the increasing global competition, manufacturers must invest in enhancing their product features (including design, functions, materials and manufacturing technology), fulfilling consumer needs (e.g. consumers' environmental and health concerns) with reduced product costs. Global consumers' attention to health and hygiene grows significant due to COVID-19, thereby driving the new materials industry to develop anti-bacterial application across medical care and daily lives. This trend is expected to continue after the pandemic, posing bright prospects to the new materials industry in the future. In addition, the biotechnology and medical care industries also benefit from the above situation with good development potential in the future.
- There will be more development opportunities for industries such as ICT, data analysis, big data application, IoT, AI and robotics driven by the wide adoption of 5G and the development of Industry 4.0 in various economies.

3. Promote industry development and break through obstacles

Traditional industries

- Most respondents in traditional industries (including microelectronics, food processing, jewellery design and processing and printing) expressed that brain drain limits the development of the manufacturing industry, particularly for the jewellery design and processing and printing industry. The northward movement of factories, ageing of skilled workers, and the perception

4 Xin, Zhou. (2018, October 12). The question mark hanging over China's 400 million-strong middle class. South China Morning post, Retrieved from https://www.scmp.com/economy/china-economy/article/2168177/question-mark-hanging-over-chinas-400-million-strong-middle

of declining industrial prospects among youngsters all constitute to the talent shortage and loss of industrial techniques. Relatively speaking, the problem of talent shortage in the recycling industry is less acute.

- The jewellery design and processing industry and the printing industry hope that the Government can provide training courses for technical talents to meet the needs of the industry and subsidise apprentices to encourage youngster joining the industries. The jewellery design and processing industry also hopes the Government can provide financial support for manufacturers to participate in overseas exhibitions and design competitions so as to expand overseas markets and widen the horizons of industry practitioners.
- In addition, the shortage of industrial land supply also limits the development of microelectronics, food processing, printing and recycling industries. Among which, the recycling industry has a large demand for land (far away from residential areas with more than 100,000 square feet of open space), and the microelectronics industry needs large clean rooms to accommodate advanced equipment. Besides, both the food processing and printing industries need sufficient space for large equipment; whereas the jewellery design and processing industry is more relied on craftmanship with relatively less demand for land.
- In addition, microelectronics, printing and recycling industries have financial needs for purchasing advanced equipment. However, the banking sector is usually more conservative to manufacturers due to the lack of understanding.
- As mentioned in Part 2, both the food processing industry and recycling industry required policy support from the government to promote development

Emerging industries

- All emerging industries (including ICT, data analysis, big data application, IoT, biotechnology, medical care, AI and robotics and new materials) believed that their development is highly dependent on the sufficient supply of talents. However, Hong Kong has a considerable shortage of engineering talents. Respondents indicated that top students in Hong Kong aim at studying medicine, law and business. Engineering is not attractive to elite students and the manufacturing industry lacks career appeal to graduates.
- Hong Kong's emerging industries have established a good foundation in product development. The investment required to enter the market (A-round financing) or make an initial public offering in the stock market are relatively not difficult. However, funding required to expand the scale of operation and expand the market share (B and C rounds of financing) could be challenging. Investors are often deterred from these financing rounds where the investment amount is huge in spite of the considerable risk of failure. Respondents expressed that Hong Kong should improve B and C rounds of financing to stimulate growth of emerging start-ups.
- In addition, they are concerned of the Government's mindset of "failure is not an option" where authorities are often overly cautious against innovations. This mentality is particularly unveiling in the approval of innovation and technology

funds. Respondents reflected that the Government requires tech start-ups to provide successful cases of new technologies as reference when applying for financial support. The application was eventually rejected as the start-ups cannot share sufficient application experiences. Although the Government is accountable to using public funds appropriately, officials must understand that innovative projects and industries have guarantee of success and this mentality of not allowing failure would obstruct the development possibilities of innovative technology and businesses with potential .

- Respondents from emerging industries also expressed that the small local market affects the commercialisation of innovative R&D outcomes. The Government should take lead in adopting new technology to speed up the commercialisation process. The industry understands the Government's role in ensuring fair competition in open tendering. However, it is hoped that the Government can relax restrictions on the tender requirements so as to achieve a win-win situation in which local innovative products are given priority in public procurement while not violating the WTO regulations.
- The collaboration among the Government, industry, academic and research sectors in Hong Kong is not smooth enough while the private sector is reluctant to engage in R&D. According to the *2018 Hong Kong Innovation Activities Statistics* published by the Census and Statistics Department, the investment in R&D of industrial and commercial sectors accounted for about 44.9% of total expenditures in R&D, far lower than that of South Korea (78.2%), Japan (77.8%) and Singapore (60.2%)[5]. While finance and trading are the major economic activities in Hong Kong, private companies rarely have manufacturing and production operations locally and therefore little R&D investment is made. Moreover, the assessment mechanism of university professors is mainly based on the quality of research papers. Professors are less involved in R&D commercialisation and collaborating with private companies in the middle and downstream R&D projects. There is not much opportunities for industry and academic cooperation.
- The current laws and regulations are established for traditional businesses, which may impede the progress of innovation-driven economy and restrict the application of innovative products. For example, the Hong Kong's first autonomous golf cart developed by the HKUST can only be tested in Shenzhen as the Transport Department does not allow the road test in Hong Kong. Some sharing economy business models cannot operate in Hong Kong as they contradict with existing laws. There is an urgent need for Hong Kong to review legislations to facilitate the commercialisation of innovative technologies.
- Land cost is a heavy burden for respondents. Also, the office space under Government supervision is much higher than those in the Mainland, which makes it difficult to attract innovative high-tech companies to remain in Hong Kong for development.
- Respondents believed that science, technology, engineering and mathematics (STEM) education is particularly important in building up problem-solving skills and logical thinking among students, getting them ready for innovation and technology development in Hong Kong. Hong Kong needs to strengthen STEM education to develop students' interest in related subjects from an early age and to lay a solid foundation for Hong Kong's talent pool.

5 UNESCO Institute for Statistics (2020), How much does your country invest in R&D? [Online]. Available from http://uis.unesco.org/apps/visualisations/research-and-development-spending/ [Accessed: 23 June 2020]

4. Views on re-industrialisation

Traditional industries

- By promoting re-industrialisation, Hong Kong hopes to revitalise traditional manufacturing industries with the latest technologies and smart manufacturing. It also supports the development of high value-added manufacturing industries that do not require much land and labour, which can become new economic growth engines for local economy.
- Traditional industries (including micro-electronics, food processing, jewellery design and processing, printing and recycling), particularly the microelectronics and jewellery design and processing industries, are high value-added manufacturing industries that do not require a large number of labour (only technical labour needed), which fulfills the conditions for re-industrialisation. On top of that, a competitive microelectronics industry is instrumental for the advancement of technology industries in Hong Kong by supplying necessary components with sound intellectual property protection.
- The printing industry does not require a large amount of labour neither. New technology is more critical for them to improve production capacity and quality. It can provide efficient and confidential services for other manufacturing industries during re-industrialisation. The recycling industry is also looking to solve waste disposal problems with technology applications through re-industrialisation. With the implementation of international regulations on waste trade, such as the latest revision of the Basel Convention, Hong Kong would not be able to export mixed, unrecyclable and contaminated plastic wastes anymore in the future. Hong Kong must speed up the re-industrialisation of the recycling industry to help resolve the local waste problem.
- The food processing industry can be re-industrialised by enhancing technology application and smart manufacturing. However, the industry requires a considerable amount of land and poses certain environmental costs (e.g. wastewater and sewage treatment). The benefit and purpose of re-industrialisation may be defeated if only low-value food is produced.

Emerging industries

- In a highly competitive global business environment, the manufacturing industry must adopt innovative technologies to enhance competitiveness. Hong Kong promotes industrial innovation by fostering the adoption of information technology, AI, data analysis, new materials and IoT, in order to move towards high technology and high value-added manufacturing models with key processes conducted in Hong Kong to inject growth momentum to the local manufacturing industry. Therefore, industries such as ICT, data analysis, big data application, IoT, AI and robotics and new materials believed that they will benefit from the implementation of re-industrialisation in Hong Kong. However, biotechnology and medical care industries do not relate their developments with re-industrialisation.

5. Views on the cooperation between Hong Kong and the GBA

- Respondents from both traditional and emerging industries believed that their counterparts in the GBA have surpassed those in Hong Kong in terms of production capacity and technology. Industrial companies in the GBA are important OEM partners for Hong

Kong-invested manufacturers. Besides, respondents hoped that the GBA can be more open to Hong Kong products so as to serve as a gateway into the Mainland market.

6. Roles of the Government

Traditional industries

- Respondents are concerned that the Government has underestimated the importance and impact of manufacturing sector, especially when the tourism and retail industry has already absorbed most of the low-skilled workers. As a small export-oriented economy, Hong Kong's economy is particularly vulnerable to external factors. COVID-19 pandemic has exposed the shortcoming of Hong Kong's over-reliance on tourism. More importantly, the northward shift of manufacturing has made it difficult for Hong Kong to produce anti-pandemic supplies locally at critical moments.
- The industry hopes that the Government can change its attitude towards manufacturing and recognise the strategic significance of the industry. In addition, the Government should also formulate long-term strategies for the future development of the manufacturing industry instead of relying on the defected market to determine the future of this sector. The Government should actively formulate short, medium and long-term targets, timeline and road maps, as well as the responsibilities of various stakeholders in the manufacturing sector. This is the only way to build social consensus in promoting industrial advancement.
- The industry has the following suggestions on the roles of the Government:
  - ⇨ Provide talent trainings according to the industry's needs, and subsidise trainees to attract young people to pursue career in the industry;
  - ⇨ Increase the supply of industrial land (e.g. build new industrial estates with discounted rent; review the policy on revitalisation of industrial buildings);
  - ⇨ Prepare information to help the banking and finance sector in understanding the prospects and credit risks of different manufacturing industries; and
  - ⇨ Provide financial support for participating in overseas exhibitions and design competitions.

Emerging industries

- Instead of long-term industrial development policy, the industry is more looking forward to the government's change of "failure is not an option" mentality. The Government should take lead in procuring local technologies and inject resources into education, financing, legislation review and land supply:
  - ⇨ Authorities should get rid of the "failure is not an option" and overcautious mentality in the approval of innovation and technology support grants. The application and assessment process should be speeded up and simplified;
  - ⇨ Invite more venture capital funds and industrialists to join the assessment panels of I&T related grants to enhance the sensitivity of exploring high potential new technology;
  - ⇨ Remove the barriers for new inventions/ new products to be included in the Government's procurement list. The Government should take lead in adopting or promoting new inventions/products of the industry to the public to accelerate commercialisation of innovative R&D achievements;
  - ⇨ Identify the bottlenecks in the collaboration among the Government,

industry, academic and research sectors and tackle them with specific actions;

- ⇨ Strengthen the functions of overseas Economic and Trade Offices, and improve the supporting services to help Hong Kong's companies in understanding procurement and tendering information in foreign markets;
- ⇨ Improve the investment environment for B and C rounds of financing to facilitate emerging industries in obtaining private funds for development;
- ⇨ Strengthen STEM education in school curriculum and cultivate students' interest in STEM from an early age. Students should be encouraged to take STEM elective subjects and to become the needed innovation and technology talents for the industry;
- ⇨ Review legislations to create a favourable environment for the innovation and technology industry; and
- ⇨ Increase land supply and allow local innovation and technology companies to rent public-owned premises at more favourable rents.

7. Expectations on FHKI

In terms of promoting industrial development, both traditional and emerging industries have the following expectations on FHKI:

- Understand and reflect industry needs to the government to advocate for policy support;
- Strive for more market opening measures with the Mainland Government;
- Seek to establish an express channel to facilitate customs clearance of Hong Kong's products through discussion with the Mainland Government;
- Strengthen the brand image of Hong Kong's manufacturing industry, especially to showcase the actual operations of the modern manufacturing industry (e.g. automated plants) and explain to students and parents the demand for technical professionals and career prospects in the manufacturing industry; and
- Strengthen business matching services to enhance mutual understanding among different manufacturing industries and create cross-industry cooperation opportunities.

Furthermore, it is suggested that FHKI needs to facilitate interactions between the traditional and emerging industries. This can allow traditional industries to identify their technology needs while emerging industries can offer corresponding solutions.

Conclusion

Respondents from both traditional and emerging industries believe that Hong Kong's manufacturing industry is competitive and promising with strategic significance to the local economy. The Government should rethink its approach on manufacturing industry and formulate long-term industrial strategy and policies to address development needs (e.g. solving the problems of brain-drain and land supply). In this regard, FHKI should take up a more proactive role in advocating for better conditions for Hong Kong's manufacturing development.

Appendix 3 "Made by Hong Kong" Research Questionnaire

Part I: Company Basic Information

1. According to main business focus, the industrial sector your company engaged in is:
   _____

2. Your company has set up the following facilities in Hong Kong:
   (may choose more than one option)
   ☐ Factory ☐ R&D ☐ Retail store ☐ Others: _____

3a. Your company opened the first factory in the Mainland in _____ ,
   located at _____ .

3b. At the peak time, how many factories does your company operate in the Mainland?
   _____ , of which _____ are in Guangdong Province.

4. As of end of September 2020, how many factories does your company operate in the Mainland?
   _____ , and they are located at _____ .

5. As of end of September 2020, how many workers does your company employ in the Mainland?
   ☐ Less than 100 people ☐ 101 – 500 people ☐ 501 – 1000 people
   ☐ 1001-3000 people ☐ 3001- 5000 people ☐ 5001 people or more
   (please specify: _____)

6. As of end of September 2020, does your company have any overseas factories?
   ☐ No (skip to question 7) ☐ Yes, a total of _____ factories and _____ workers hired

6a. Location of overseas factory (may specify more than one place): _____

6a. Total investment for overseas factories (in HK$): _____

7. Top three major markets of the company, please specify the percentage:

☐ Mainland	_____ %	☐ Europe	_____ %
☐ United States	_____ %	☐ Middle East	_____ %
☐ Southeast Asia	_____ %	☐ Africa	_____ %
☐ Japan and South Korea	_____ %	☐ Others	_____ %

8. In the past one year, what is the total annual sales of your company? (in HK$)
   ☐ <50 million ☐ 50 - 99.99 million ☐ 100 - 999 million ☐ >1 billion

9. As compared with the previous year, how does your company predict the total annual sales next year?
   ☐ Increase by _____% ☐ Decrease by _____% ☐ No change

Part 2: Condition of business upgrade and transformation

10. Which of the following industrial phase is the main factory of your company at?
☐ Traditional production ☐ Hybrid of traditional and automated production
☐ Automated production ☐ Industrial IoT production

11. Do you think the production line of your company has much room for development in the following areas?

	Not Likely				Very Likely
a. Introduction of automation technology	1	2	3	4	5
b. Introduction of industrial IoT technology	1	2	3	4	5

12. As compared with 2010, what upgrade and transformation strategies has your company adopted?
☐ Maintain consistent business strategy without much change (skip to Part 3)
☐ Management innovation ☐ Brand Building
☐ Strengthen product design ☐ Strengthen technology R&D
☐ Other strategies _____

13. In the past one year, what was the percentage of R&D spending in your overall operating expense?
☐ < 1% ☐ 1% - 2.9% ☐ 3% - 4.9%
☐ 5 - 6.9% ☐ 7% - 9.9% ☐ > 10%

14. In the next year, how will the percentage of R&D spending in your overall operating expense change?
☐ Increase by _____% ☐ Decrease by _____% ☐ No change

15. What difficulties does your company face in the process of product R&D ?
(may choose more than one option)
☐ Difficult to protect intellectual property rights in the Mainland
☐ Difficult to hire suitable professionals in Hong Kong
☐ Difficult to hire suitable professionals in the Mainland
☐ There are issues on customs declaration for transferring small batch of test samples or materials between R&D teams in Hong Kong and the Mainland
☐ Procedural obstacles in the knowledge transfer with academic and research institutions in Hong Kong
☐ Loss of tech talents in Hong Kong
☐ As compared with the Mainland, Hong Kong government has
☐ insufficient policy support ☐ insufficient subsidy support
☐ insufficient in both policy and subsidy support

16. In the past, has your company applied the **BUD Fund** to upgrade and transform your operations and production?
☐ No, but I am aware of the BUD Fund
☐ No, I am not aware of the BUD Fund
☐ Yes, my company has been granted with funding of HK$ _____

Part 3: Industry Relocation

17. Where is the headquarter of your company?

☐ Hong Kong ☐ Mainland ☐ Other places: _____

18. What function is the Hong Kong company responsible for? (may choose more than one option)

☐ Sales and marketing
☐ Technical support
☐ R&D
☐ Administrative management
☐ Product design
☐ Finance, accounting and legal support
☐ Engineering technology (e.g. for quality control)
☐ Others _____

19. What function is the Mainland company responsible for? (may choose more than one option)

☐ Sales and marketing
☐ Technical support
☐ R&D
☐ Administrative management
☐ Product design
☐ Finance, accounting and legal support
☐ Engineering technology (e.g. for quality control)
☐ Others _____

20. To what extent does your company think the following roles of your Hong Kong company will be replaced by Mainland company?

	Very unlikely				Very Likely
a. R&D	1	2	3	4	5
b. Sales and marketing	1	2	3	4	5
c. Finance, accounting and legal support	1	2	3	4	5
d. Engineering technology	1	2	3	4	5
e. Administrative management	1	2	3	4	5

Part 4: Set up production lines in Hong Kong

21. To what extent your company will face the following situations when considering to set up advanced and high value-added production lines in Hong Kong:

	Strongly Disagree				Strongly Agree
a. Unable to recruit necessary professionals	1	2	3	4	5
b. High cost of in-house talent development	1	2	3	4	5
c. Design of industrial buildings fail to meet the technical requirements of the new production line	1	2	3	4	5
d. Insufficient industrial land supply	1	2	3	4	5
e. Difficulties in financing R&D projects in Hong Kong	1	2	3	4	5
f. Obtaining government approval and permits is time-consuming and the procedures are complex	1	2	3	4	5
g. Insufficient information in application for factory license or certificate of origin	1	2	3	4	5
h. Lack of industrial policy support	1	2	3	4	5
i. Insufficient support for industrialisation	1	2	3	4	5

22. If your company conducts advanced manufacturing and high value-added production activities in Hong Kong, please evaluate the importance of following third-party producer services to your company 's development

Third party service	Strongly Disagree				Strongly Agree
a. Automated production system design and construction	1	2	3	4	5
b. Industrial design and product development	1	2	3	4	5
c. Advanced product testing and certification	1	2	3	4	5
d. Centralised logistics and warehouse services	1	2	3	4	5
e. Factory layout and 3D production	1	2	3	4	5
f. Development of precision engineering technology	1	2	3	4	5
g. Small batch production	1	2	3	4	5
h. Technical Training	1	2	3	4	5

Part 5: Strategies and development directions in response to China-US trade disputes

23. Has your company adopted "China+1" strategy in response to China-US trade disputes?

☐ No (skip to question 25) ☐ Yes, location: _____

23a. Reasons for adopting "China+1" strategy (may choose more than one option)

☐ Customers' requirement ☐ Avoid US tariffs
☐ Maintain stable supply of labour ☐ Convenience in materials procurement
☐ Cope with increasing production costs in the Mainland
☐ Expand overseas markets

23b. What difficulties have you encountered when setting up a factory in this place? (may choose more than one option)

☐ Shortage and instability of labour supply
☐ Labour efficiency is lower than that in the Mainland
☐ High land costs
☐ Prevalence of trade unions hinders operation
☐ Difficulty in financing
☐ Difficulty in mastering local laws and regulations
☐ High logistics cost
☐ Difficulty in liaising with local government
☐ Difficulty in finding local partners
☐ Others _____

24 Has your company adopted the following coping strategies in response to China-US trade disputes ? (may choose more than one option)

☐ Expand the domestic market in Mainland with the support of dual circulation economic strategy (increase: _____%)
☐ Shift market focus from Europe and US to the Mainland and Southeast Asia (transfer: _____%)
☐ Increase the share of domestic sales and expand production lines in the Mainland
☐ Explore the ASEAN market (increase: _____%)
☐ Relocate to Hong Kong
☐ Terminate business

Part 6: Policy Advocacy

26. To what extent do you agree that following measures can facilitate the development of manufacturing in Hong Kong?

	Strongly Disagree				Strongly Agree
a. Maintain Hong Kong's status as a separate customs territory	1	2	3	4	5
b. Promote collaboration among the government, industry, academic and research sectors	1	2	3	4	5
c. Provide tax incentives and subsidies for R&D and advanced manufacturing	1	2	3	4	5
d. Enhances efficiency, transparency and communications in government approval processes	1	2	3	4	5
e. Speed up the revitalisation of industrial buildings to meet the needs of high-tech production	1	2	3	4	5
f. Strengthen communications between relevant government departments and the industry to introduce industrial support measures as needed	1	2	3	4	5
g. Promote industrial development alongside sustainable development	1	2	3	4	5
h. Provide special customs channels for scientific research materials between Hong Kong and the Mainland	1	2	3	4	5

Part 7: Contact Information

Company name: _____

Company representative: _____

Tel. / Email: _____

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Binary Semiconductor Company Limited
Chewy International Foods Limited
Shan Shau Jok
Able Jewellery Manufacturing Limited
Elegance Jewellery International Limited
Regal Printing Limited
Ideastore Limited
Baguio Green Group
Mil Mill
Cherrypicks Limited
Synap Technologies Limited
Vita Green Health Products Company Limited
Time Medical Limited
Winner Medical (Hong Kong) Limited
Tung Hing Automation Investment Limited
Goa International Limited
Raze Technology Limited
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