Abstract

Hong Kong´s economy has shown impressive improvements in productivity arising from technical progress. This is despite the fact that Hong Kong has spent very little on R&D and that its industry has been concentrated in labour-intensive sectors with limited technological opportunity. Businessmen and government have been critized for decades over their supposed short-sightedness and lack of support for technology. The characteristics of Hong Kong´s economy are short-termism, flexibility, tight control of unskilled labour, use of general assets only, little spendings on training, family business. What the record of productivity performance shows is that this combination of „high IQ and low technology“ can deliver improvements in efficiency which have not been achieved in more „technophile“ Asian economies. This suggests that the need for high technology industry in East Asia has been exaggerated and that policies and business strategies built on the perception of that need are misguided.

Zusammenfassung

In dem vorliegenden Papier wird die aktuelle Diskussion über die Entwicklungspfade junger Industrienationen im asiatischen Raum aufgegriffen. Kritisch setzt sich der Autor mit dem High Tech-Argument auseinander, nachdem internationale Wettbewerbsfähigkeit ausgeprägte Investitionen im Hochtechnologiesektor erfordert. So zeige jedoch das Beispiel Hong Kong eindrucksvoll, daß auch eine Wirtschaft Produktivitätsprünge und Wachstumserfolge erzielen kann, die sich bislang auf arbeitsintensive Produktionsprozesse und geringe F&E-Aufwendungen beschränkt habe. Ermöglicht werden diese durch eine effiziente Kombination von „high IQ and low technology“, deren Charakteristika Kurzfristigkeit, Flexibilität, ein großes Reservoir unqualifizierter Arbeitskräfte, kurze Anlernzeiten und die traditionellen Strukturen aiatischer Familienunternehmen sind. Da die wirtschaftlichen Zuwachsraten Hong Kong´s teilweise deutlich über denen anderer Industrienationen im Pazifikraum liegen, kommt der Autor zu dem Schluß, daß die Notwendigkeit einer High Tech-Ausrichtung Südost-Asiens bisher deutlich überschätzt worden ist und eine Orientierung hierauf für Hong Kong möglicherweise in eine Sackgasse führen kann.

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THE FUTURE SHAPE OF HONG KONG'S ECONOMY: WHY LOW TECHNOLOGY MANUFACTURING IN CHINA WILL REMAIN A SUSTAINABLE STRATEGY

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INTRODUCTION

The future of work and management in Hong Kong depends upon the distribution of the workforce across sectors, the nature of employing organisations, and the postures they adopt in seeking profits. With policy-making now firmly in local hands, there has been considerably more active debate on those issues and on the role which should be played by government intervention. The purpose of this chapter is to examine the view that Hong Kong may, and should, become a 'world class industrial power' (Berger and Lester, 1997:xiii), competing through innovation in high-technology manufacturing. The argument put forward here can be summed up in three statements. First, Hong Kong has no need for a manufacturing sector within the boundaries of the city. Second, Hong Kong firms manufacturing in China and other low-cost locations have no need to re-orient themselves towards a more 'high-tech' stance. Third, the Hong Kong environment is poorly suited to innovation so that the territory's firms would be unable to make such a shift 'en masse', even if it were desirable.

This is not a pessimistic analysis. Hong Kong's people can look forward to well-paid work in the service sector as the territory continues to re-focus on its traditional "merchanting" capabilities, transforming low-value products in one location into higher-value products in another.

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THE STORY THUS FAR: FROM ENTREPOT TO SERVICE SECTOR ECONOMY VIA MANUFACTURING

For the first century of the colony's existence the economy was dominated by the trading sector and manufacturing was restricted to a few hundred small factories. By 1941, when war broke out with Japan, only about 90,000 workers were engaged in manufacturing, from a population of 1.6 million.

The territory which returned to British rule was a desperate place in which the options open to the population were highly restricted. The UN/US embargo prevented the return of the entrepot trade. Agricultural development was prevented by the terrain. Mineral resources were negligible and manufacturing for the domestic market was restricted by its small size. The production of manufactures for export offered the only opportunity available.

Even within that narrow scope prospects were limited. Hong Kong firms could only compete on the basis of cost-leadership, secured through the management of low-cost labour. Geographical, cultural and linguistic distance from markets in the US and Europe made it too costly for manufacturers to identify the needs of consuming households directly, and the technical knowledge needed to translate those needs into product designs was not available. Hong Kong businessmen therefore relied on their customers to provide the product designs and marketing channels, while they themselves focussed on procuring inputs, managing production and making sales.

The focus on labour-intensive sectors, and the separation between product design, production and marketing, were efficient responses to the pattern of resource prices and availabilities. As a result, 'low-tech' manufacturing provided the engine of growth for Hong Kong's economy from the 1950s until the early 1980s. At its peak, in 1981, manufacturing employment exceeded 900,000, spread across nearly 47,000 establishments.

Manufacturing began to decline as a source of employment in the early 1980s, following the decision of the Chinese Communist Party to open the mainland to foreign investment. Responding with vigour to the market signal that lower cost labour was available across the border, Hong Kong's manufacturers transferred production into China, concentrating initially on Guangdong province and the Pearl River Delta in particular. According to Chinese statistics, (MOFERT/MOFTEC, 1994) by 1993 the country was host to more than 100,000 Hong Kong-invested enterprises. Guangdong alone provided the location for more than 40,000 of them, employing in the region of 6 million workers. 'Made by Hong Kong' (Berger and Lester, 1997) superseded 'Made in Hong Kong' and the re-allocation of Chinese labour from low-productivity agriculture into Hong Kong-managed light industry produced huge increases in the mainland's output and exports. These in turn increased demand for 'manufacturing and trade-related' services in Hong Kong, and the territory's pattern of employment shifted dramatically from manufacturing towards services.

TABLE 1
PERSONS ENGAGED, BY SECTOR, 1982 TO 1997
Manufacturing and "Manufacturing and Trade-Related Services" (MTRS)

Sector	1982	1987	1992	1994	1997
MANUFACTURING	847,194	867,947	565,137	423,015	288,887
MTRS	386,331	558,384	855,637	1,036,831	1,099,654
of which:					
Import/Export	132,629	240,167	395,444	503,039	510,571
Transport, Storage and Communications	87,578	105,974	145,661	164,198	178,104
Finance, Insurance, Real Estate and Business Services	166,124	212,243	314,532	369,594	410,979

Source: Hong Kong Government, Annual Digest of Statistics, various issues

As Table 1 shows, employment in manufacturing is now very significantly exceeded by that in manufacturing and trade-related services.

This process of de-industrialisation has been almost entirely positive in its impact on Hong Kong's people. National income has grown steadily to US$21,670 per capita at purchasing power parity in 1995, above that of the UK, Germany and Japan. Total employment has grown at least as fast as the population, so that the rate of unemployment has rarely exceeded 2.5 per cent, remaining below 5 per cent even in the "crisis" conditions of Summer 1998. These figures mask high levels of inequality (Turner et al, 1980: 65-68, 1991:14-17) and there has been persistent unemployment amongst ex-manufacturing workers who lack the skills to move into the service sector. Nevertheless, it is undeniable that Hong Kong has a high performance economy which has served most of its citizens well.

THE CONTINUING ALLURE OF MANUFACTURING AND HIGH TECHNOLOGY

Despite the prosperity which has accompanied Hong Kong's de-industrialisation, a conventional wisdom has grown up to the effect that there is something amiss with the city's development. In particular it has become fashionable in academic and policy-making circles to express concern about the increasing dependence upon the service sector, and to call for government intervention in support of high-technology industrial development.

There is nothing new about this call for a higher level of technological sophistication. More than thirty years ago Espy (1965) and Leary (1965) warned that Hong Kong firms were paying insufficient attention to technology, and that the city's economy was vulnerable for that reason. At that time, the Hong Kong Government was firmly wedded to the policy of 'positive non-interventionism'. It took no heed of the call for more

technology, businessmen wisely ignored the advice proffered, and the economy prospered. By 1977, however, the policy environment had changed. Concern was expressed in official circles that the territory's ability to compete in export markets was being eroded by rising wages, the emergence of lower-cost locations and the impact of protectionist policies in major markets. Government became receptive to the call for technological up-grading and commissioned a study on the diversification of the economy. The resulting Diversification Report (Hong Kong Government, 1979) marked the beginning of a shift away from the policy of 'positive non-interventionism' towards one of 'minimum intervention with maximum support' (Yeh and Ng, 1994).

In the event, the concerns which led to the Diversification Report were rendered irrelevant by the opening of the Chinese mainland, which provided a ready supply of cheap labour. Nevertheless, the arguments in favour of the high-tech vision have retained their currency and they have been pressed with vigour as the city has returned to Chinese rule. Those arguments may be presented as a set of four propositions, which are as follows.

Proposition 1. Hong Kong 'needs' to have manufacturing within the borders of the SAR.

Proposition 2. Hong Kong has fallen behind other 'dragon' economies in respect of technological development, and needs to 'catch up'.

Proposition 3. Hong Kong's manufacturing sector will lose its ability to compete in world markets unless it implements a significant change in its competitive posture, away from cost leadership, flexibility and speed in low and medium technology market segments and towards differentiation and innovation in high technology segments.

Proposition 4. Hong Kong has the conditions which are required to achieve the shift in posture suggested in Proposition 3.

The argument put forward here is that each of these propositions is false. Hong Kong only needs manufacturing within its borders if the definition of 'manufacturing' is extended so far that it includes most of the service sector. Hong Kong has no need to emulate the technological development activities of its neighbours in the region. The city's manufacturers do not need to shift their competitive stance and they would be unable to do so if it were in fact required. Each of these apparently contrarian assertions may be considered in turn.

DOES HONG KONG NEED TO HAVE MANUFACTURING OPERATIONS WITHIN ITS BORDERS?

The proposition that Hong Kong needs manufacturing activity within the borders of the SAR is articulated by Kwong (1997) and in the collection of studies which make up the recent MIT Report (Berger and Lester, 1997). Kwong (p.5-6) puts forward three arguments. The first is that services cannot be exported on a massive scale. The second is

that even if some services are exportable they will not provide significant additional employment. Third, it is argued that the service sectors (and financial services in particular) do not exhibit sufficient growth in labour productivity to bring rising prosperity.

Every one of these claims is wrong, in principle and in Hong Kong fact. Services can be exported on a massive scale as Hong Kong firms earn foreign exchange through financing trade and investment, insuring goods and property overseas, and brokering trade, as well as hosting tourists. As Table 2 shows, Hong Kong enjoys a balance of payments surplus in services, while suffering a deficit in goods.

Table 2
HONG KONG'S TRADE IN GOODS AND SERVICES
($HK billion, 1990 prices)

	1986	1989	1991	1993	1994	1996
Exports of Goods	310.5	583.9	750.7	1,021.0	1,127.3	1,322.0
Imports of Goods	319.2	579.0	767.8	1,057.5	1,206.0	1,430.9
Balance of Trade in Goods	- 8.7	+ 4.9	- 17.1	- 36.5	- 79.0	- 108.9
Service Exports	105.0	137.4	148.9	178.0	189.1	223.5
Service Imports	55.8	78.2	97.6	113.3	121.9	133.1
Balance of Trade in Services	+ 49.2	+ 59.2	+ 51.3	+ 64.7	+ 67.2	+ 90.4

Source: Hong Kong Government, Annual Digest of Statistics

While these figures demonstrate the service sector's ability to export its own output, they also represent a massive under-estimate of the sector's contribution to the city's total overseas sales. As the 'manufacturing and trade-related' service industries provide indispensable inputs to the process of exporting manufactures, they are also responsible for a very significant, though unknown, proportion of the value of those exports and re-exports. The city can earn the foreign exchange it needs by servicing the manufacturing sector. It does not need to produce its own manufactures.

The service sectors are also capable of absorbing large amounts of labour, as has already been shown in Table 1, and those workers have been employed at higher levels of value-added per person than have obtained in manufacturing. Table 3 shows the available data.

Table 3
VALUE ADDED PER PERSON ENGAGED IN MAJOR ECONOMIC SECTORS
1984 and 1995 ($HK,000)

Sector	1984	1995
Manufacturing	55	229
Wholesale/retail, import/export, restaurants, hotels	86	266
Financing	174	450
Business Services	136	263

Storage	130	264
Communications	178	650
Transport,	101	313

Source: Hong Kong Government, Annual Digest of Statistics, various issues

Clearly, Hong Kong does not need manufacturing in order to export, to provide employment, or to secure high levels of productivity.

The MIT Report also asserts that manufacturing is needed in Hong Kong, but it approaches the issue in a rather different way. First it is noted that manufacturing and services have been converging (Berger and Lester, 1997:27-30). The service sector provides inputs to manufacturing and the value of manufactures depends increasingly on services which are embodied in the product , including design, customisation, and timely delivery. Many firms in the service industries are closely dependent upon manufacturing and could not survive without it. Indeed, as a Hong Kong Trade Development Council (1997) report confirms many companies which were previously classified as manufacturing firms have been re-classified as service sector establishments. The implication of this convergence is that there is significant 'undermeasurement of the real scale and scope of manufacturing industry in Hong Kong' so that the employment and output figures under-estimate the importance of manufacturing to the city's prosperity.

This is undoubtedly true. However, it has no bearing on the question of whether Hong Kong needs manufacturing, as conventionally defined, within the boundaries of the SAR. The important debate is not whether the city needs to have manufacturing in the broader sense suggested by the MIT Report. No sensible commentator would ever suggest otherwise, because manufacturing has, in effect, been re-defined to include most of the service sector. The debate is about whether the city needs to have the material-cutting and stitching, metal-fabricating, plastic moulding and extrusion activities which once employed so many people and which have now moved to China. The evidence set out above on trade, employment and productivity shows that Hong Kong does not need to have those operations within its boundaries. Manufacturing is important to the city but it does not need to be located inside the SAR. The manufacturing activity which matters is that which takes place elsewhere.

HAS HONG KONG FALLEN BEHIND ITS NEIGHBOURS IN RESPECT OF TECHNOLOGY, AND DOES IT NEED TO CATCH UP?

The second proposition put forward in support of the high-tech vision has two parts. The first is that Hong Kong has fallen behind other countries in the region, with respect to the resources devoted to technological development. The second is that there is a need to catch up.

There is no doubt about the validity of the first part of this proposition. If attention focusses on the inputs which are applied to technological development in Hong Kong, the immediate outputs of scientific endeavour, or the city's technological infrastructure, then

Hong Kong is a “low-tech” backwater in comparison to countries like Singapore, South Korea or Taiwan . Table 4 draws together some of the macro-level indicators.

Table 4
TECHNOLOGICAL INDICATORS

	R&D as % of GDP 1994	Annual Growth Rate of Scientific Publications 1980-95	US-registered design and utility patents 1995	Patents registered per 100,000 residents 1992-3	'Technological Infrastructure' Indicator [a]
Singapore	1.18	82.85	61	n.a.	40
S.Korea	2.29	280.98	1,240	9.25	41
Taiwan	1.80	83.47	2,087	66.46	35
Hong Kong	0.10	40.41	248	0.20	21

[a] an indicator constructed by the US National Science Foundation
Sources: Amsden (1997) p.344-5, World Competitiveness Yearbook, 1995, 1996

However, these figures do not themselves demonstrate that there is a need to catch up. If the objective of the economy is to provide growth in the incomes of its residents, then Hong Kong has actually outperformed its more technophile neighbours in important respects (Davies, 1996). A whole series of studies on East Asian growth, including those by Young (1994, 1995), Krugman (1994) the World Bank (1993), and the Hong Kong Monetary Authority (Hawkins, 1994) reach the conclusion that the Hong Kong economy has delivered higher rates of growth in total factor productivity (TFP) than Singapore, Korea and Taiwan.

At first sight, there appears to be a contradiction between the evidence that Hong Kong is technologically backward and the finding that its economy has delivered higher rates of TFP growth than its more technophile neighbours. The complexities of econometric technique certainly provide room for debate over the details (Chen 1997). However, for the Hong Kong case, the central point is clear. The city's economy has delivered rapidly increasing productivity over a period in which activity has shifted dramatically towards the service sector, and when TFP in the manufacturing sector has actually been declining (Kwong, 1997:34). Those facts alone demonstrate that it is the move to the service sector which has been delivering the gains in productivity. Hong Kong's re-allocation of resources away from low productivity manufacturing towards the merchanting function has produced rates of productivity increase which have exceeded those achieved in nearby economies which trumpet their 'high-tech' aspirations and continue to focus on relatively inefficient manufacturing sectors.

The proposition that Hong Kong 'needs' to emulate its more technophile neighbours because it has 'fallen behind' them is false. What matters is not the resources or the publicity devoted to high-technology, but the results achieved. Hong Kong has reason to be proud of its record in respect of productivity growth. There has been no falling behind.

DO HONG KONG FIRMS PRODUCING IN CHINA NEED TO CHANGE THEIR STRATEGY?

The third proposition put forward in support of the argument that Hong Kong 'needs' high technology manufacturing is that the current 'Hong Kong Model' is not sustainable as a means of competing in world markets. The reasoning behind that view has a number of components. On the cost side, the MIT Report (Berger and Lester, 1997:.51) points out that Hong Kong firms in China are very heavily concentrated in the neighbouring Guangdong province. In that province both wages and land prices have been rising, so that there is pressure on costs, making it more difficult to compete on the basis of cost-leadership. However, the concern over wages is misplaced. Certainly, according to Sung et al (1995), wages in Guangdong province in 1992 were 45-76 per cent higher than in neighbouring provinces, having been roughly comparable in 1978. However, the difference in cost between one Chinese province and another is of very little relevance to firms who are competing in overseas markets. What matters for their ability to compete in world markets through labour-intensive operations is the cost of labour in comparison with other places in the world. The reality in that respect is that labour costs in Guangdong continue to be remarkably low in comparison with labour costs elsewhere. According to Morgan Stanley (Economist, 1996) the total hourly cost of labour in China, including benefits provided and sick pay, was 25 US cents in 1995. That was the same as the cost in India and compared with 30 US cents in Indonesia, 46 US cents in Thailand, 71 US cents in the Philippines, $1.59 in Malaysia, $US13.77 in Britain, $US17.20 in the United States, $US23.66 in Japan and $US31.88 in Germany. Even if labour costs in Guangdong were 100 per cent higher than the national average they would still be little more than two-thirds of the cost in the Philippines. Given Guangdong's advantages in respect of its access to Hong Kong's trading infrastructure, and the difficulty of conducting business in other low-cost locations (which have been significantly exacerbated by the Asian financial crisis), there is little reason to fear that the output of Guangdong province will become uncompetitive.

One of the reasons for the continuing low cost of labour in Guangdong province lies in the availability of an estimated 5-6 million migrant workers from other parts of the country. The MIT Report (Berger and Lester, 1997:53) points out that their rootlessness is a source of tremendous local tension and hence a threat to the Hong Kong model. That is certainly true, and industrial development in Guangdong is not a pretty sight. Nevertheless, the presence of these workers, and the tens of millions being made redundant from state enterprises, will keep labour costs in China extremely low for many years to come. Many of these workers are far from Guangdong but improvements in transport and communications are making it much easier for the workers to come to the work and vice versa. With a per capita income of $US424 in 1994, China still has an effectively infinite supply of low-cost unskilled labour. Hong Kong firms producing in China have little to fear in respect of being replaced by lower-cost locations.

In any event, it is myopic to see such competition as damaging to the competitive prospects of Hong Kong firms. If labour becomes available at lower cost elsewhere it will

become efficient to transfer some activities to those new locations, especially those which are most labour-intensive. Hong Kong firms excel in the management of those processes, and in delivering their outputs to the global market, and they will be well-suited to take advantage of the opportunity. This does not imply that there must be a down-turn in the economy of Guangdong. To argue thus is to assume that the amount of work is fixed, so that new jobs created in one location must mean fewer jobs elsewhere. As new manufacturing locations increase their output they become customers as well as competitors, providing new markets for Guangdong products: NAFTA has not resulted in American jobs disappearing to Mexico. Nor would there be a net disappearance of Guangdong jobs and factories. Trade and development is not a zero-sum game in which one region's gain is another's loss but a process of exchange in which all parties may reap gains.

The second set of factors which led the MIT Report (Berger and Lester, 1997:55-57) to doubt the sustainability of the Hong Kong model concerns the effectiveness of the city's competitors, especially the Japanese. Drawing on Hatch and Yamamura (1996) they suggest that Chinese businessmen seek quick profits and therefore fail to acquire the 'dynamic technological efficiency' which results from Japanese long-term investment. They suggest that American business has also been making remarkable progress in managing production in East Asia and that the advantage of Hong Kong firms when operating in China will soon be eroded. A central feature of the argument is that the existing Hong Kong model has led to a 'lock-in to low-wage manufacturing' which has 'retarding effects on technological advance.' (p.159)

The problem with this assertion is that it assumes erroneously that more advanced technology is essential to competitive success, even where such technology is entirely inappropriate. This is shown most pointedly by the way in which the MIT researchers misunderstand their own example of 'modular manufacturing' in the apparel industry. Modular manufacturing provides a means by which rapid response can be achieved, using teamwork amongst multi-skilled workers (Berg et al.,1996). Attempts were made in Hong Kong to introduce this technology, and a pilot factory was constructed - the kind of government intervention sought by the high-tech lobby. However, modular manufacturing failed to attract interest from Hong Kong manufacturers and today none of them use it. The MIT interpretation is that this demonstrates the weakness of the Hong Kong model by showing how the availability of low cost labour retards the adoption of technologies which offer productivity gains. The proper interpretation is that modular construction is not appropriate in the Hong Kong/China situation. To introduce a technology which requires multi-skilled team-workers where such workers are not available would be a stupid move, not a wise one. The unquestioned conviction of the MIT researchers that more advanced technology is necessarily better begets the elementary economic error commonly made by 'engineering man' (Wells, 1984) when taking decisions in a low-wage environment.

It is certainly the case that Hong Kong firms place great emphasis on 'quick money' which directs them away from spending on research and development. However, that

short term focus is the driver of their superb performance in respect of speed, flexibility and cost. It also directs them into industries and market niches which American and Japanese firms have given up, so that they do not compete with them directly. Hong Kong firms would certainly have difficulty if they tried to compete head-on with the Americans and Japanese. They very sensibly do not. This may limit Hong Kong firms' 'dynamic technological efficiency'. However, if profitability can be sustained by using mature technology developed elsewhere at someone else's expense it is irrational to incur the risk and expense associated with innovation. Only if local technological development is seen as an end rather than a means is this a disadvantage.

While the MIT Report raises doubts about Hong Kong firms' ability to maintain cost leadership, and draws attention to the supposed dangers of retarded technological development, other commentators have cast doubts on the demand side of the Hong Kong model. As one local economist, Tsang Shu-ki, put it;

> 'Can the world continue to accept so many cheap goods so that the Pearl River Delta can have continual growth?' (Lau, 1996:9)

This seems intuitively appealing but it ignores the fact that it is the market for cheap goods which is expanding most rapidly, while the market for expensive goods is relatively static. Despite the current financial turmoil, most of the world's economic growth in the next two decades is still expected to come from five nations - China, India, Russia, Brazil and Indonesia. These are countries with low per capita incomes whose citizens cannot afford higher-value-added products. What they can afford are the kind of cheap but decent products which Hong Kong firms produce in China. Conversely, the rich countries, whose citizens provide the market for the more expensive products which would result from high technology manufacturing, are growing slowly. They are also well-endowed with firms who are adept enough at the production of innovative and high-value products to be able to pay their workers more than 130 times the cost of a Chinese worker. If we re-phrase Tsang Shu-ki's question to ask 'will the world start to buy expensive goods from the Pearl River Delta?', the fallacy is made clear.

A final consideration in the debate over the sustainability of the 'Hong Kong model' lies in the problem of ensuring a supply of Hong Kong managers to direct manufacturing operations in China. The MIT Report (Berger and Lester, 1997:161) notes that Hong Kong people continue to play a key role in the day to day management of Guangdong manufacturing and that the development of PRC managers has been very slow. Growth may therefore be inhibited by shortages of managers, particularly if Hong Kong firms attempt to move further inland in pursuit of cheaper labour.

A number of responses may be made to this argument. First, there are many ways in which Hong Kong firms can economise on managers' time, and economising is something at which they are expert. Improved communications are reducing journey times in China so that managerial resources can be stretched much further. Second, there are hundreds of thousands of PRC nationals in supervisory positions who are now

experienced in the manufacturing aspects of the Hong Kong model. If a tiny proportion of them become managers, the problem will be resolved in respect of those functions. It is certainly true that PRC nationals will have difficulty in fulfilling functions which require regular communication with buyers in sophisticated markets. However, those activities are already carried out in Hong Kong itself.

There is no reason to suppose that the supply of managers in China is inelastic and the predicted shortage of managers will probably not materialise. Even if it does, and Hong Kong-controlled firms reach the limit of their growth for that reason, the "high-technology" route does not offer a viable alternative. The pursuit of high-technology manufacturing would create an even greater demand for managers having skills of a much higher order. These are even more scarce, and more difficult to develop, because they are totally different from those applied in Hong Kong and Guangdong over the past forty years. In any event, if Hong Kong-controlled manufacturing firms do reach their limit in this way, that does not preclude growth in the rest of China's manufacturing sector. The city's income can continue to grow by providing the services needed to process the trade arising from PRC-controlled manufacturing. As argued above, Hong Kong 'needs' manufacturing in the sense that manufacturing provides the demand for the city's services. However, that manufacturing does not need to be located in the city, nor does it need to be controlled by Hong Kong firms. As long as Chinese output is growing, so can the city grow.

In summary, there is no convincing reason to suppose that Hong Kong firms need to shift their competitive stance. China contains tens of millions of cheap workers who can fuel the growth of low-cost operations for decades. If other locations do become more attractive in terms of labour costs, Hong Kong firms have well-established advantages in the management of labour-intensive production for sale in world markets, which will allow them to manage and profit from operations in those new locations. The markets for low to mid-range products are growing more rapidly than those for top-end products. While this certainly means that the level of technology applied remains low, that is no cause for concern. It simply reflects an appropriate choice of technique in the Chinese circumstances. It might be the case that Hong Kong firms producing in China reach a limit to their growth, set by the limited supply of managerial resources. However, the supply of those resources is probably elastic and in any event Hong Kong's growth could continue with a further re-focussing on the services needed to support manufacturing and trade.

COULD HONG KONG'S MANUFACTURING FIRMS GO HIGH-TECH IF THEY NEEDED TO?

If Hong Kong does not need high-technology manufacturing then it matters not whether the manufacturing sector is capable of taking that route. However, the high-tech lobby's argument is partly based on the contention that Hong Kong's business systems are ready to take up the high-tech 'opportunity'. That idea forms the central thrust of the MIT Report and it is also to be found in Kwong (1997), which recommends a 'design-

intensive' version of the 'high-tech' strategy. It also appears in statements and speeches made by leaders of the technophile lobby. Consider the following example;

> Today, I strongly believe that in the next few decades, Hong Kong stands a better chance than any other place in the world of repeating the Silicon Valley story. All the right ingredients are in place. There has been a mushrooming of knowledge or technology based entrepreneurial initiatives in Hong Kong. We see more and more well-educated young Hong Kong people leaving teaching and research posts at universities and technology-oriented jobs in large firms to start up their own businesses. Typically, they are armed with limited personal savings and one bright idea. Importantly, many of them have a good knowledge of the talents available in the various pockets of scientific and engineering excellence in China, where their bright ideas can be complemented at a relatively low price (Chi'en, 1994).

The first problem with this romantic vision is that it involves a misunderstanding of Silicon Valley (see Florida and Kenney, 1990). The second is that it runs counter to the evidence which has been collected on the nature of Hong Kong's environment and the capabilities of its business system. It has been shown above that Hong Kong lags behind the other 'dragon' economies in respect of the macro-level indicators of technological capability - spending on R&D, patenting and technological infrastructure. That finding is reflected in almost every study carried out on Hong Kong manufacturing. Davies and Whitla (1995) report that the ratio of value-added to gross output in Hong Kong's most successful domestic manufacturing sectors hardly changed at all between 1978 and 1991. Lui and Chiu (1993) found that Hong Kong firms had continued to rely on labour-intensive methods. Leung and Wu (1995) concluded that Hong Kong's 'innovation environment' is not conducive to innovation, because the industrial system is dominated by small firms, technology linkages are weak and interactions amongst firms, support organisations and universities are also weak. Kwong (1997:34) found that the level of technology in manufacturing has been falling, with a particularly rapid decline since 1989. The Hong Kong Industry Department (1996) reported little activity in respect of new products and processes. Yeh and Ng (1994:466) found that 'when we look at the formidable list of factors for successful high-tech industrial developments, Hong Kong does not seem to stand a good chance of succeeding.'

These findings are re-inforced by research and consultancy reports on individual sectors. The MIT Report's own chapter on textiles and clothing confirms an earlier study by Kurt Salmon Associates (1988) with the finding that 'promising areas in new product development and new technologies are barely represented in Hong Kong today' (Berger, Gartner and Karty, 1997:166). A report by P-E Consulting (1988:8) on the metals and light engineering sector found that 'few leading edge technologies are employed in the sector and the general level of production technology is not high'. The MIT Report 's chapter on electronics found that there is 'relatively little technology and/or product innovation taking place in Hong Kong today' (Reif and Sodini, 1997:196). In biotechnology, where the Technology Road Map study declared in 1991 that 'Hong Kong is sufficiently innovative, dynamic and intellectually resourceful to become a

biotechnology centre in the Asia Pacific region' (Chang et al, 1991:168), MIT found in 1996 that 'one would not expect any drug discoveries or biopharmaceutical manufacturing to emerge from the territory's industrial sector' and that in the universities 'we were not able to find any new products at the discovery stage' (Wang et al, 1997:258). While the MIT Report went on to identify traditional Chinese medicine as a possible opportunity for biotechnology in the city, it has already been reported that hospitals in Hong Kong lag behind those in the US in its use (Moir, 1997).

What is remarkable about many of the studies which have examined Hong Kong's technological capability is that they provide detailed and accurate descriptions of Hong Kong's inadequacies, but then make a contradictory leap of faith to draw the conclusion that Hong Kong therefore both needs and has great potential for technological development. Having found the environment unconducive to innovation, Leung and Wu (1995:533) assert that because Hong Kong has 'local entrepreneurship, technical ingenuity and an established trading network' the city has the potential to develop an 'indigenous advanced technology base'. How the one set of conditions leads to the other is not explained. Yeh and Ng (1994:466) follow their description of the territory's technological inadequacies with the assertion that 'we have established that there is an urgent need for Hong Kong to develop high-tech industries'. The only evidence offered in support of that conclusion is the observation that value-added as a percentage of output is relatively low in Hong Kong's domestic manufacturing and the state has done more to support high-tech industry in Japan, Korea, Singapore and Taiwan.

This conflict between evidence and conclusions is most pointed in the main body of the MIT Report. Chapter after chapter explains that Hong Kong faces 'challenges' and 'hurdles' in its attempts to introduce high technology, and yet faith in the high tech vision never wavers. This is equivalent to examining a desert, finding it dry and then concluding that it provides major opportunities for the development of water-intensive agriculture! The MIT study does identify a few manufacturing companies who have been successful in following the higher value-added route, and others are exhorted to follow that route with Government help. However, the high-value-added group is very small indeed, comprising perhaps 20 companies, out of more than 100,000 Hong Kong firms producing in China. Only in Amsden's 'minority report' does the MIT study connect with reality, when she notes that 'Hong Kong's seemingly negligible R&D activity does not inspire hope that manufacturing capabilities will prove an engine of growth in the near future' (Amsden, 1997:332)

This lack of logic might have been avoided if the studies in question had appropriate methodologies, allowing them to proceed in a meaningful way from the evidence to their conclusions. However, the methodology they employ consists of listing Hong Kong's strengths and weaknesses and then recommending that the weaknesses be addressed. What that approach fails to recognise is that the strengths and weaknesses of Hong Kong's manufacturing industry both arise from the same set of characteristics. The features which allow fast response, flexibility and effective cost leadership are the same features which prevent innovation, design leadership and the move into high technology.

As Leonard-Barton (1992) has indicated ‘core capabilities’ often bring with them ‘core rigidities’. This can be seen more clearly by returning briefly to the history of Hong Kong manufacturing.

Hong Kong’s manufacturing sector came into existence as a response to the geo-political changes of the 1950s, which deprived the city of its entrepot function.. The entrepreneurs who created Hong Kong industry had very limited resources. They had to work within the technical competence available to them, they had to overcome the problems caused by the large physical and psychic distance to their markets, and they had to protect themselves from the impact of unpredictable changes in those markets. They also had to work within the context of Chinese culture within which individuals exhibit low levels of trust towards those outside the family (Carney, 1998).

The manufacturing sector which developed from that inauspicious set of circumstances was a miracle of collective ingenuity, having a number of highly idiosyncratic features. First, it was restricted to the low-price segments of just four sectors: textiles and apparel; metal products and machinery; plastic products; and electrical/electronics. Second, it was overwhelmingly made up of small Chinese family businesses who have been well-described as ‘merchant-manufacturers’ (Riedel, 1974) These firms had low levels of funding, raised within the family. They focussed on quick returns and they carried out vertically very shallow ‘single-phase’ operations (usually assembly), using limited amounts of general-purpose equipment. The entrepreneurs who owned these firms were expert at controlling cheap labour working at high intensity and adept at avoiding the unnecessary expense of product design, marketing or staff development. If markets changed, they could exit one segment and enter another, using the same low-cost general purpose equipment - sewing machines, simple materials handling equipment, low-tech metal and plastic-working tools. Managerial role definitions, functional structures and hierarchies were non-existent and technical expertise from outside the family was regarded with suspicion. They operated by ‘mechanical market response’ and their key ‘merchant manufacturing’ capability lay in taking orders, purchasing inputs at lowest cost and monitoring single-phase production operations.

This population of firms was a highly effective adaptation to a niche in the environment. As a result it has reproduced itself with very little change. Its key capability has persisted (Davies, 1998) and Hong Kong manufacturing today retains the characteristics which defined it in the 1950s. However, the attributes which make those firms so effective in that niche are inconsistent with the requirements of a system designed for innovation. The ability to shift rapidly from one supplier or customer to another is a strength but it prevents the development of the intense relationships which are needed for innovation. Vertical shallowness allows the close monitoring of cheap labour which gives low cost, speed and flexibility. At the same time, it restricts the domain of the workers’ knowledge base and prevents them from identifying opportunities for innovation which may arise in connection with the inputs to the process, the use of its outputs, or the links between them. High intensity of effort holds down costs but it also limits workers’ opportunities for learning. Innovation requires ‘patient money’, which is not to be found in Hong Kong.

It requires investment in specialised assets, the placement of trust in technical experts and the development of close links with the most sophisticated customers, who are still at a long distance from Hong Kong. Innovation requires large-scale spending in pursuit of uncertain returns. None of these requirements are consistent with the objectives and behaviour of the firms which make up the Hong Kong manufacturing sector. If such firms were forced to choose between attempting to compete through innovation and exit from the sector, their most likely response would be to exit, investing their accumulated profits in property, while making use of their well-developed merchanting ability in other activities.

CONCLUSION: IF NOT HIGH-TECH MANUFACTURING, THEN WHAT?

If Hong Kong's economy is unlikely to shift towards high-technology manufacturing, it remains to consider the shape which the city's economy will take in future. The most likely scenario, disappointing as it may be to the technophile lobby, is a continuation of the current trend. Perhaps the most remarkable feature of the city's economic development has been the persistence of its merchanting capability, built around rapid response to market signals. That capability provided the basis for the entrepot economy, it determined the nature of the 'merchant manufacturing' sector which grew up in the artificial circumstances of the closed-China period, and it underpins the manufacturing and trade-related service sector which now dominates. The best prediction for the future is that the city becomes increasingly focussed on the provision of those services. Its industrial structure will consist of tens of thousands of tiny Chinese family businesses 'doing the deal' and adding value to China's manufacturing output,. Those tiny firms cannot fulfil those functions where there are economies of scope or scale. They will therefore continue to operate in an infra-structure of transport, communications and financing provided by the hierarchies of the government, the multinationals, the few large Hong Kong firms and (increasingly) firms from mainland China.

If this prognosis is correct, it is also interesting to ponder the future of the 'Made by Hong Kong' manufacturing sector, made up of Hong Kong-controlled firms producing outside the city. It has been argued here that this sector may prosper and grow by maintaining its current competitive posture in low-cost manufacturing activities. However, faced with more comfortable opportunities in the service sector, the entrepreneurs who own these activities may choose to opt out from the rigours of direct control and management. It is reasonable to speculate that management, and perhaps ownership, may pass to PRC citizens. It would be only natural for the 'merchant manufacturers' of Hong Kong to sell off their manufacturing facilities to mainland interests, invest the proceeds in property, and then continue to make money by organising the sales of their erstwhile establishments and others. Such a prospect may horrify those who believe that owning and controlling manufacturing operations is a must. For the citizens of the city it bodes well. After all, why would any pragmatic Hong Kong businessman, faced with a choice between that comfortable future and addressing the expensive 'challenges' and 'hurdles' associated with the high-tech route, chose the latter?

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