RECENT DEVELOPMENTS IN AND CHALLENGES FACING HONG KONG'S INNOVATION SYSTEM[1]

By Naubahar Sharif

In the decade following Hong Kong's transition from British rule to the current "one-country, two-systems" partnership with the People's Republic of China and its new status as a Special Administrative Region of China (the HKSAR), the former colony has survived, thanks to the 1997 Asian financial crisis and the more recent SARS epidemic, in an unexpectedly volatile economic environment. This period of economic and political change followed some 40 years of robust economic growth punctuated only by the occasional short-term adjustment to external events. During this period, Hong Kong became a major regional center of trade, finance, transportation, and communications, consolidating its position as the primary entrepôt between China and the world. However, the ongoing opening of Mainland China to the world economic community and capital investment has displaced Hong Kong as the world's gateway to China.

The economic world order in which Hong Kong now finds itself is driven increasingly by the flow of information through advanced technology. It is a world in which technological innovation, in both manufacturing and service industries, has become essential to growth and development. Innovation is found in both products and processes, and Hong Kong's transition from its role as China's primary shipping hub into a major Asian financial services center provides plenty of opportunity for innovation to play a key role. As we

will see, however, Hong Kong has yet to provide the institutional support needed to fuel development through increased innovation.

A Brief History of Innovation in Hong Kong

Hong Kong's past success was built largely on its capacity to provide cost-effective goods and services, so its colonial governors had little incentive to encourage or support innovation. In fact, the success of Hong Kong manufacturers from the 1950s through the 1970s was rooted mainly in opportunistic exploitation of its geographic land space on the part of Mainland immigrants, particularly textile barons from Shanghai who, fleeing the Communist regime, transferred start-up capital and expertise to the colony.[2] In this environment, technological sophistication was secondary to old-fashioned cost-cutting and the leveraging of established trade networks. Costs inevitably rose, however, and eventually, with the opening of Communist China that began in 1979, Hong Kong's manufacturers moved onto the Mainland, where they enjoyed lower land and labor costs.

Thus in the period leading up to the handover, Hong Kong's entrepreneurs, with the advantage of cultural and linguistic familiarity, overcame higher labor costs in the colony while maintaining their model of export-led growth without needing to invest heavily in research and development. In establishing and upgrading this organizational model, with Chinese business flourishing in Hong Kong while controlling a robust manufacturing base in Guangdong, these firms simply leveraged their

traditional strategy of imitation or followership. Organizational know-how trumped formal R&D for new product development.[3]

These developments played out, of course, against the backdrop of Hong Kong's robustly *laissez-faire* policy of 'positive non-intervention' (a policy approach that is now called 'small government, big market'). Under this approach, the government creates infrastructure that allows entrepreneurs to exploit market opportunities. Otherwise, it assumes a hands-off posture. While some believe that this tradition has been exaggerated into near-mythic proportions—the government has intervened in business affairs in some sectors—it applies quite accurately to the history of Hong Kong's innovation system.[4] Prior to 1998, then, there was little or no structured innovation activity in Hong Kong. In contemporary terms, there was no innovation *system*. Minimalism prevailed.[5]

The shock of the financial crisis of 1997 changed the course of innovation in Hong Kong. With considerable urgency, the government played an active role in spurring economic growth by establishing new institutions to provide Hong Kong with a real innovation system integrating business, government, and institutional components. The government saw in such an innovation system a new engine for growth that might help the newly established SAR extricate itself from a potentially ruinous predicament. In March of 1998, the new HKSAR Chief Executive, Tung Chee-hwa, set up a high-level panel—the Commission on Innovation and Technology (CIT)—to advise the government as it sought to forge institutional arrangements

capable of driving innovation and technological development. The CIT published two reports, the first in September, 1998 and its second and final report in June, 1999. Through these efforts, the HKSAR seemed poised to begin a new era with an active innovation system, and in so doing indelibly mark the system's future trajectory. Unfortunately, it would be several years before the elements of a robust innovation system would begin falling into place.

The CIT itself was short-lived. The government disbanded it following the publication of its second report and left no follow-up mechanism to put its recommendations into effect. Its chair, the influential Professor Tien Chan-lin, died on October 30, 2002. These events left innovation and technology policymaking in the hands of a civil service with little experience in these areas. There would be no fast track to innovation in Hong Kong. Indeed, it would be four years following the commission's demise before the government would again convene a policymaking body with an improved innovation system as its mission.

In attempting to pick up the lost thread of official support, the government formed the Steering Committee on Innovation and Technology (SCIT) in January, 2004. This was to be the "high-level policy group" that would "coordinate innovation policy" in the wake of the CIT, as indicated in its first report. The SCIT was comprised of members of the Council of Advisors on Innovation and Technology (CAIT), plus other academics and industrialists.[6]

In spite of the momentum lost due to disbanding the CIT and the death of Professor Tien, several important developments carried Hong Kong's fledgling innovation system forward. Chief among these was the establishment of an Innovation and Technology Fund (ITF), with HK$5 billion (about US$650 million) at its disposal to finance R&D projects for the business sector. Parallel initiatives included the Applied Science and Technology Research Institute (ASTRI), the Hong Kong Science and Technology Parks Corporation (HKSTPC), and the Cyberport infrastructure project. ASTRI performs 'mid-stream' R&D and transfers it to industry. The HKSTPC provides a range of services that supports industrial production at various stages, including technology start-ups for firms carrying out applied R&D activities.[7] Cyberport provides information technology (IT), telecommunications and digital media facilities to aid in creating a cluster of IT companies that would develop new technologies, applications, services and content. More recently, in April, 2006, the HKSAR government established five R&D Centres to strengthen collaborative work by industry and research organizations. These centres, dispersed among local tertiary institutions and ASTRI, undertake industry-oriented research in automotive parts and accessory systems, information and communication technologies, logistics and supply chain management technologies, nanotechnologies and advanced materials, and textiles and clothing.[8]

The government's drive to make Hong Kong a knowledge-based economy has also required it to revamp its bureaucratic structure. It

established the Innovation and Technology Commission (ITC) to spearhead this development and refocused the Hong Kong Productivity Council (HKPC) to provide integrated support of innovative, growth-oriented firms across the value chain. Finally, an alternative board on the Hong Kong Stock Exchange, the Growth Enterprise Market (GEM), was established to provide a source of equity funding for similar innovative, high-growth companies that have yet to establish their full profitability potential.

Then and Now

The recent history of Hong Kong's innovation system may seem encouraging. Even as the disbandment of the CIT undermined its initial impetus, we have seen movement along several fronts towards a slightly more rational innovation policy. There is little doubt then that innovation in Hong Kong experienced a sea change following 1998. We can summarize this progress by noting five significant changes in the innovation system that distinguishes the post-1998 era from anything that preceded it.

First, the funding of innovation and technology is no longer as ad hoc and piecemeal as it had been prior to 1998. Finance under the umbrella of the innovation fund is not only more plentiful but also more consolidated and better coordinated. Second, more actors—from government, industry and research institutions, among others—have joined the innovation system. We see, therefore, a greater number and variety of institutional elements providing a richer store of resource inputs. This is where ASTRI, for example,

produces new innovations and links industry to new technological developments. Third, the government's post-1998 commitment to innovation has grown dramatically. This has resulted in the various policymaking initiatives we've reviewed here. In spite of the loss of momentum to which we have alluded, the ITC adopted a 'New Strategy' in 2005 that reflects its renewed commitment. Fourth, this New Strategy suggests that government officials are learning from past mistakes; the recent initiatives provide greater integration of services and funding and suggest as much. Finally, and most significantly, the new approach also includes greater integration with the Mainland, particularly in the Pearl River Delta (PRD) region. The ITC's collaboration with the Guangdong Provincial Department of Science and Technology is much more active than anything that occurred pre-1998, and the HKPC's focus now includes the PRD.

For the first time in its history, then, Hong Kong has many of the elements in place to form a robust, integrated innovation system. It faces an uphill battle, perhaps, in the competition for a share in the global information-driven economy, but the light appears to have dawned at last. Instead of maintaining its pre-handover posture of positive non-intervention, the government seems poised to play a role in making Hong Kong a player in the world market. Rather than shrinking in the shadow of the economic behemoth that the Mainland has become, Hong Kong is learning how to leverage its unique position into a new era of growth and progress. Is the future now?

Creating a New Future

Hong Kong's colonial history as a trading hub, coupled with the government's longstanding aversion to active intervention in market mechanisms, has left its innovation system underdeveloped. The aforementioned changes notwithstanding, there is a long way to go. The diversity and institutional range of Hong Kong's innovation system compares poorly with those in many other small countries. Singapore, for example, had already been actively promoting technology development prior to 1990 and has since then redoubled its long-term strategic effort to raise the R&D profile of its firms. In my view, then, Hong Kong's innovation system faces three significant challenges as it moves forward.

First, *Hong Kong must accelerate the pace of innovation system improvement*. It lags behind most comparable economies in this respect. As we have seen, there was nothing resembling a formal, coordinated innovation policy prior to 1998. Even since then progress has been halting and somewhat piecemeal. If we compare Hong Kong's innovation record with those of developed countries, other industrializing Asian countries or other territories and nations of similar size, Hong Kong is a conspicuously late arrival. Even Mainland China has a better innovation record.

Hong Kong's commitment, such as it is, suffers by comparison in terms of both timing and magnitude. As recently as 2005, R&D expenditure by the government was only 0.79% of GDP, a figure that compares unfavorably with similar expenditures in Singapore, Taiwan, Korea, Japan and the Mainland,

where the figure at that time was 1.34%, almost 60% higher than in Hong Kong. If Hong Kong is to join the ranks of small but highly developed nations such as Finland, it must boost its R&D expenditure dramatically

A second challenge to innovation system improvement lies in Hong Kong's relationship with the mainland. *Hong Kong must strengthen its links to Mainland China*. Consider, for example, coordination in economic development among cities and sectors surrounding the Yangtze River Delta region. We have noted that Hong Kong has begun to recognize the opportunities that exist in fostering economic ties with the Pearl River Delta. However, unless innovation system improvements come more quickly than the current pace indicates, it will be difficult for that region not to fall behind the Yangtze delta and other mainland regions. To be sure, the ITC has established mechanisms for collaborating with China at the ministerial, regional and provincial levels, but there are complaints on both sides of the border about effort's pace and intensity. If China's vigorous promotion of innovation and technological development continues unabated, Hong Kong will find itself marginalized at the national level. Perhaps Hong Kong can forge sufficiently strong ties with the Mainland in building upon its traditional role as a trading hub by becoming an 'innovation hub' for the region.

Hong Kong's third innovation challenge is to institutionalize *better coordination of policy measures*. This lack of coordination owes primarily to the comparative novelty of government intervention in the innovation system. We have reviewed several policy changes and initiatives dating to the two CIT

reports, but implementation of its recommendations has been, as we have seen, piecemeal at best. With weak oversight from higher-level agencies, individual initiatives suffer. Consider, for example, the Applied Research Fund (ARF). This fund predates the handover, having been founded in 1993 as a government-owned source of venture capital with an initial holding worth HK$750 million (about US$96 million). It was intended to promote R&D activities with commercial potential among local firms. Due to a poor track record under government management, its operations were turned over to private venture capital firms in 1998. As recently as June, 2004 the fund appeared in an ITC consultation paper as an important element of Hong Kong's innovation system. Yet ongoing losses forced it to discontinue making investments as of March, 2005. Despite the government's many opportunities to shut it down because of continued large losses, its demise came with little notice to stakeholders.

We can further illustrate this policymaking disconnect by noting that in spite of establishing the Innovation and Technology Council as a centralized government agency to oversee and improve the system, several other government agencies have kept their fingers in the innovation pie. For example, the Intellectual Property Department (IDP) continues its role in handling issues involving intellectual property rights and competition over content, the Financial Services Branch (FSB) continues to supervise financial system innovations and regulatory agencies such as the Office of the Telecommunications Authority (OFTA) and the Television and Entertainment Licensing Authority (TELA) continue to manage innovations in media and

telecommunications. No central policymaking body exercises a coordinating function that supersedes the separate operations of such diverse agencies.

Clearly, the Hong Kong government must adopt a more holistic approach. It needs either a dedicated policymaking agency to exercise principal authority for innovation and technology or, in the absence of such an authority, existing agencies must coordinate their individual efforts to provide a more concentrated and coherent deployment of innovation-bound resources.

I close with a note on the conceptualization of an innovation system. Innovation scholars worldwide have shown that innovation systems are almost always complex, highly interactive arrangements with feedback loops that not only generate new knowledge but also make novel use of existing knowledge. Yet from the outset, as evidenced by the original reports of the Commission and Innovation and Technology, Hong Kong's government has operated with a strictly linear model that represents only one among several viable alternatives. This model has been particularly maladapted to Hong Kong, with its historically low levels of R&D and high levels of entrepreneurial activity. It is therefore in Hong Kong's interest to discard it in favor of a more interactive concept that better reflects the unique conditions—namely, high levels of entrepreneurship with low levels of R&D investment—under which Hong Kong has undertaken the development of its innovation system.

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[1] This article is based on a previous publication by the author, "An Examination of Recent Developments in Hong Kong's Innovation System: 1990 to the Present", from Science and Public Policy, vol. 33, issue no.5 (2006).
[2] These Shanghai industrialists concentrated on low-cost manufacturing in the labor-intensive textile and clothing industries.
[3] The bulk of private-firm R&D expenditure in Hong Kong is devoted to redesigning and improving products as well as to making them easier and cheaper to produce. In other words, process innovation has often taken precedence over product innovation in Hong Kong's industries.
[4] Hong Kong's government has always to some extent controlled important sectors of the economy, including land supply, housing policy and exchange rates. Hong Kong has never, for example, allowed unrestricted allocation of land resources because the local government has always monopolized the supply and sale of land in the territory.
[5] Among the few noteworthy resources during this period were the Industrial Support Fund (ISF) and the Services Support Fund (SSF). The ISF, established in 1994, financed mainly technology development. Projects were undertaken mainly by industry support agencies such as trade federations, tertiary institutions, or trade and industry associations. From 1994 to 1998, the ISF had committed HK$1.2 billion to some 340 projects. The SSF financed projects beneficial to the development and competitiveness of Hong Kong's service industry. The SSF received a capital sum of HK$50 million upon its launch in 1996. After this amount was fully committed, an additional HK$50 million was injected into the SSF in late 1997. Both funds were subsumed by the Innovation and Technology Fund in 1999.
[6] The CAIT comprises 17 members, 15 of whom, from the business and academic sectors, locally and overseas, are non-official. Two government officials—the Secretary for Commerce, Industry and Technology and the Commissioner for Innovation and Technology—are the only official members of the CAIT.
[7] The HKSTPC was formed by merging the former Hong Kong Industrial Estates Corporation, the Hong Kong Industrial Technology Centre Corporation (HKITCC) and the Provisional Hong Kong Science Park Company Limited.
[8] The ITF has earmarked HK$2.6 billion to support the establishment and project funding of the R&D Centres in the first five years.