

INNOVATED BY HONG KONG

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Executive Summary

Hong Kong's economy has enjoyed rapid growth in recent years. However, the transformation of Hong Kong's economy remains a significant problem. The increasingly high labour cost and the recently implemented regulations on labour protection in the Mainland of China, especially in the Pearl River Delta (PRD) area, has severely challenged Hong Kong's industrial sector.

In fact, it is not the first time for Hong Kong to meet such a challenge – the situation was almost the same 30 years ago when Hong Kong's labour and land cost went up. It was the open-door policy of China that has enabled Hong Kong to maintain its traditional low-cost and labour-intensive business model by simply moving factories to the PRD area - a paradigm change from “Made in Hong Kong” to “Made by Hong Kong”.

In the midst of the pressures of globalization and our weakened industrial competitiveness, the industry of Hong Kong has a choice to perish or to reinvent itself. This time, should Hong Kong's industrial sector try to extend the cost minimization business model by simply moving its factories to other places with lower cost labour and land than that of the PRD? In the context of globalization and the evident trend of setting focus on innovation and technology by industry in almost every economy of the world, Hong Kong may have no other choices but to transform its economy and develop its innovation and technology sector. In the mean time, new models of technology innovation, especially the “Open Innovation” system, can offer Hong Kong policymakers some insights by casting new lights into how the traditional “Closed Innovation” business model could be transformed to bring in new energy to Hong Kong companies and cultivate an innovation and technology sector. Should visionary policies be implemented based on this framework, Hong Kong would have a good chance to turn itself into a successful innovation and technology-orientated economy.

A. Urgency to Change

It has been well studied that an economy's competitiveness will come from her capacity to innovate and upgrade the industry, rather than her natural resources or labour pools as the latter can be easily accessed elsewhere through modern technology¹. Studies also indicate that an

¹ Porter, Michael E. (1990). *The competitive advantage of nations*. New York: Free Press c1990

economy may fall into the “wealth-driven” stage after passing through “factor-driven”, “investment-driven” and “innovation-driven” stages². In some of the highly developed economies, the innovation-driven stage and the wealth-driven stage are going in parallel and in a synergistic fashion. In the “wealth-driven” stage, firms are run by stewards rather than entrepreneurs, and the nature of foreign investment changes from technology transfer to purely financial investment. It is a stage that leads to wealth accumulation rather than wealth creation.

Unfortunately, Hong Kong has arguably leaped into the “wealth-driven” stage without going through and benefiting from the “innovation-driven” stage as other economies have, at least in the innovation and technology-orientated industrial sector. The Global Competitiveness Report 2007-2008 by World Economic Forum³ has Hong Kong ranked 12th in the world according to the overall Global Competitiveness Index (GCI), a decline from the 10th position in 2006-2007. As a measurement of Hong Kong’s ability in innovation, the sub-index for innovation ranks Hong Kong at the 23rd place compared to Korea (8th), Taiwan (9th) and Singapore (11th).

The danger that Hong Kong is falling into the “wealth-driven” stage prematurely and the fact that Hong Kong has an imbalanced economic structure (Figure 1), calls for an urgent examination of our innovation and technology policy.

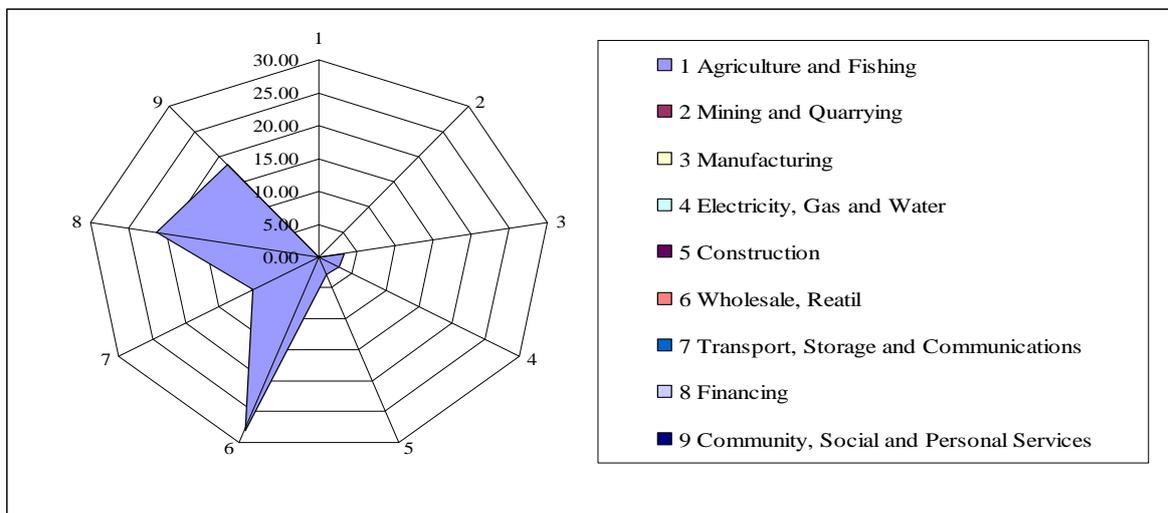


Figure 1 Gross Domestic Product (GDP) by Economic Activity 2005 (percentage)

² DS Cho, HC Moon, (1998). A nation's international competitiveness in different stages of economic development. *Advances in Competitiveness Research*, 6(1): 5-19.

³ <http://www.weforum.org>



B. Myths for Innovation and Technology Development in Hong Kong

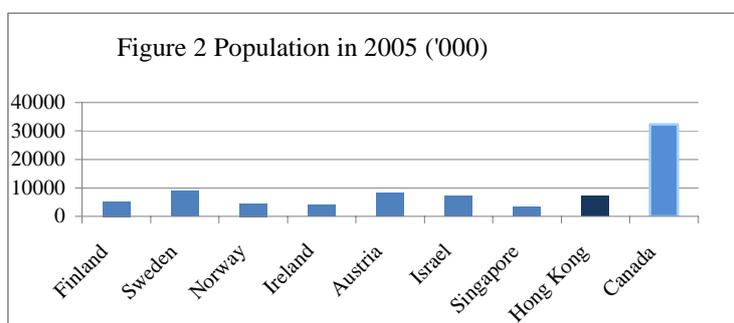
There have been various arguments and counter-arguments on the needs of public policies related to innovation and technology in Hong Kong. Voices against initiatives of developing innovation and technology in the past can be summarised as follows:

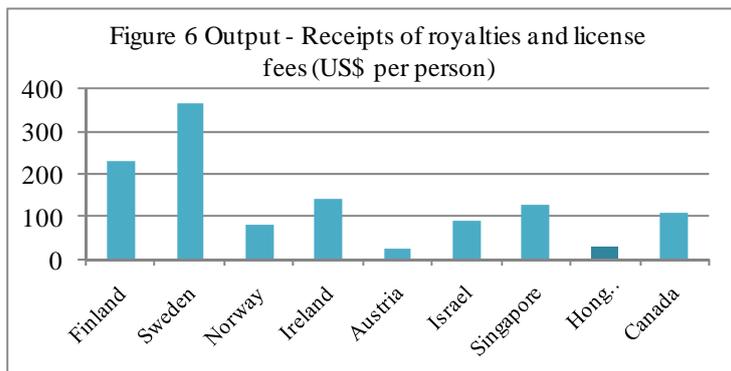
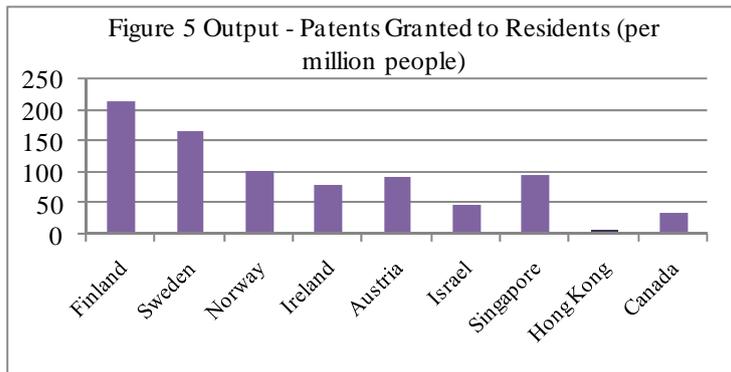
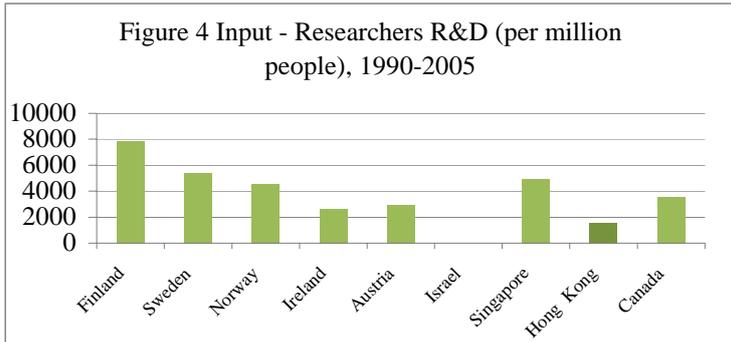
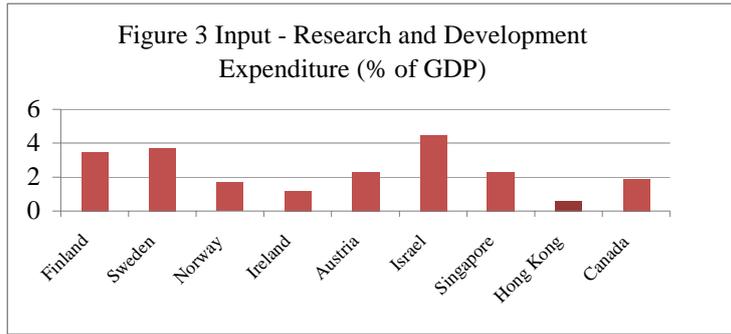
- Hong Kong is too small to have its own innovation and technology industry and, there is therefore no need for such a public policy
- Hong Kong should focus on developing itself into a financial centre like New York and London; attempting to do anything else will be distracting;
- Hong Kong can just be a “buyer” and “user” of innovation and technology, and there is really no need for Hong Kong to be engaged in the development of innovation and technology;
- Hong Kong has neither talents to innovate nor the infrastructure to be engaged in innovation and technology development.

These myths are misleading. To formulate a sound innovation and technology policy, these myths need to be clarified as follows:

1. Does Size Matter?

Figure 2 to Figure 6 benchmarked economies with a population size similar to that of Hong Kong; but we have also included Canada for discussion purpose. These figures clearly indicate that the main reason for Hong Kong lagging far behind other economies is the low input in the innovation and technology sector measured by the expenditure on R&D as a percentage of GDP and the number of researchers per million citizens.





2. *Financial Centre but not Technology Centre?*

Firstly, the Government should not rely on a single economic sector to develop Hong Kong's economy as it is risky and unsustainable. The financial sector, as an example, is a provider of services and would only develop in conjunction with other economic sectors which have a propensity to consume such services. With the fading of the traditional manufacturing sector in their respective economies, innovation and technology industries have been the fuel propelling the growth of the financial services sector in cities like, New York and London. Secondly, developing the innovation and technology industry will not necessarily distract Hong Kong from being an international financial centre. Innovation and technology are in fact critical to the further strengthening of Hong Kong's status as a regional financial centre.

3. *Buying or Making?*

According to the World Bank, "the extent and quality of technology transfer from abroad is highly dependent on the absorptive or learning capacity of the domestic economy, which in turn depends on the education and training of the labour force, the extent of domestic R&D and domestic innovation effort."⁴

Characteristic of small and medium size enterprises, Hong Kong companies are not directing much of their resources into R&D. The lack of R&D means Hong Kong may suffer from a relatively slower learning process and thus higher costs. In order to build up a strong innovation and technology-orientated economy, a meaningful level of R&D should be carried out.

4. *Does HK have Enough Capacity to Develop Innovation and Technology?*

Hong Kong has a solid tertiary education foundation and a large talent pool with high potentials. It can also leverage talents from the Mainland of China and other regions as long as effective schemes can be deployed.

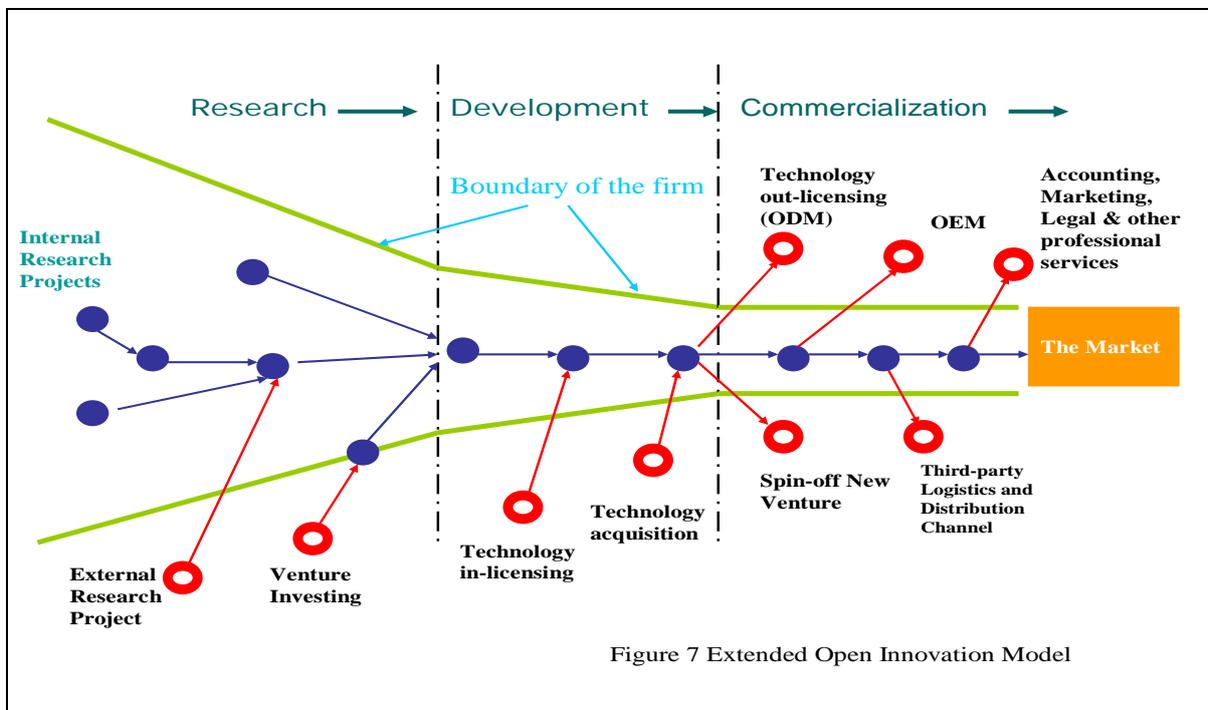
Hong Kong also has a top-tiered technology infrastructure including wired and wireless communications, reliable and trustworthy legal framework, and a solid financial infrastructure.

⁴ Brahmabhatt, M. and A. Hu, (2007) "Idea and Innovation in East Asia", *World Bank Policy Research Working Paper* No. 4403, World Bank.

C. Implications of Open Innovation to Hong Kong

For decades, industry has operated in “Closed Innovation” thinking – a business philosophy which believes that successful innovation requires control. However, “Closed Innovation” is regarded as a paradigm in the age of “BI” (Before Internet). Since the beginning of this century, or in the age of “AI” (After Internet), we have witnessed a paradigm shift towards “Open Innovation” thinking⁵. This paradigm shift has significant implications for Hong Kong’s innovation and technology policies.

Figure 7 shows an Extended Open Innovation Model we proposed.



In the Extended Open Innovation Model, there are at least nine approaches for external parties to work with the “major company” at different stages of the overall innovation process. Correspondingly, the “major company” can take at least nine approaches to leverage external resources.

⁵ Chesbrough, Henry (2003) The logic of Open Innovation: Managing Intellectual Property. *California Management Review* 45(3): 33-58.

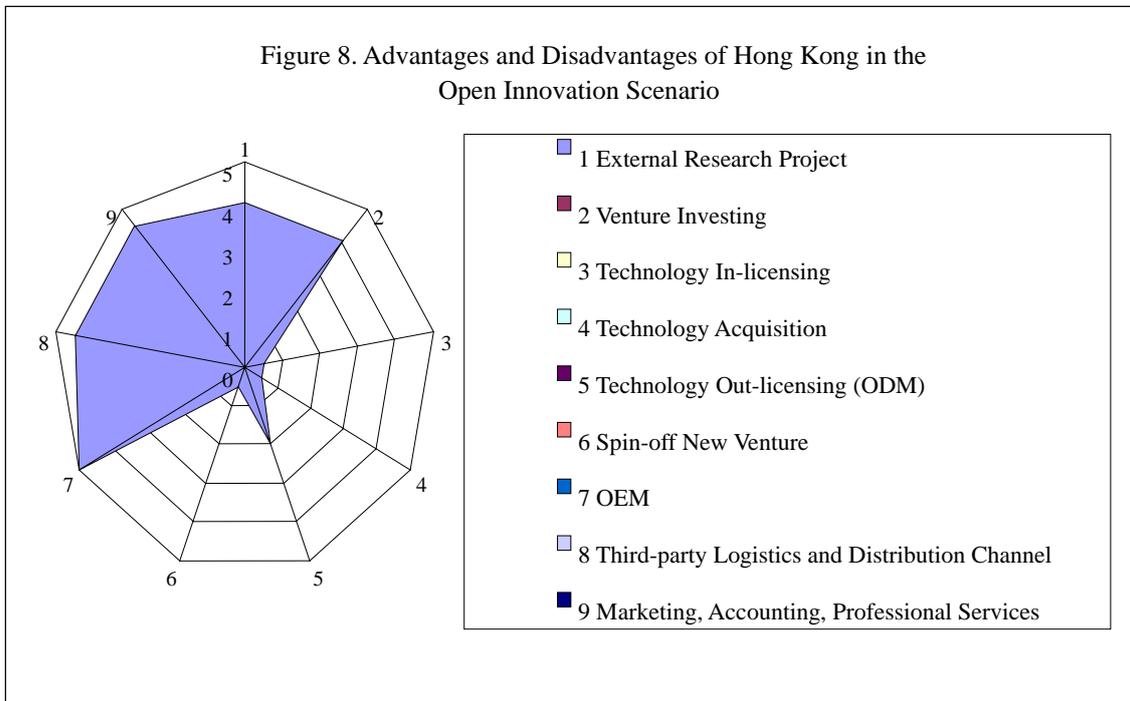
Hong Kong as external party of major companies has advantages in the following aspects:

- a. In the performance of contracted R&D projects, as universities in Hong Kong have successfully positioned themselves as research universities;
- b. Given Hong Kong's status as Asia's largest Venture Capital (VC) centre, venture investing jointly with the "major company" on projects of high market potentials could be encouraged;
- c. Many Hong Kong's companies are motivated to take the Original Design Manufacturing (ODM) business model by licensing-in technologies from other parties including the "major company" for product design and production, although this is still at its initial stage;
- d. Operating the Original Equipment Manufacturing (OEM) business model by taking orders from the "major company". Hong Kong has great strength in OEM as a result of experience accumulated in past decades;
- e. Providing efficient third-party logistics and distribution channels; and
- f. Providing marketing, accounting and other professional services.

Due to Hong Kong's low input in innovation and technology development, and the absence of major technology companies, Hong Kong has almost no advantages in the following aspects:

- a. Licensing-out intellectual property to the major company;
- b. Having the technology, or, even the company, being acquired; and
- c. Setting up spin-off new ventures.

Figure 8 is a conceptual diagram that illustrates the advantages and disadvantages of Hong Kong in the "Open Innovation" scenario based on the above analysis. To develop Hong Kong's innovation and technology industry, Hong Kong should invest more in R&D and take possession of more intellectual properties. Hong Kong should also strengthen its traditional sectors by upgrading its technical level, such as the adoption of advanced manufacturing systems. The government should also build up an efficient intellectual property transaction platform.



The “Open Innovation” could also provide an opportunity for Hong Kong’s companies to transform themselves into “major companies”. They may take a reverse approach, namely changing their business model from OEM to ODM and then to Original Brand Manufacturing (OBM) by leveraging external parties’ advantages. Should they be successful along this reverse development path, they may become “major companies” instead of just providing services to the incumbent “major companies”.

The “Open Innovation” provides an opportunity for Hong Kong to leap forward to an innovation and technology-oriented economy. To take full advantage of this opportunity, a visionary government policy is needed.

D. Hong Kong's Innovation and Technology Policy: A Review with Reference to the "Output-thinking" Framework

"Input-thinking" refers to the mode of thinking that focuses mainly on the injection of financial resources when fostering innovation and technology development, while paying no heed to how effectively these resources are used and neglecting the quality of the processes involved. The underlying rationale is that more input would bring more useful output. However, empirical evidence shows that this is not necessarily the case.

Scholars of the European Institute for Innovation and Technology Management have advocated an alternative mode of thinking – "Output-thinking". "Output-thinking" denotes that the economic competitiveness of companies and countries depends on whether the processes are managed successfully. It takes into account of all factors influencing the successful outcome of the innovation process that determines the competitiveness of companies and entire national economies. These factors include the efficiency and productivity of resource utilization in addition to the input of financial resources. The high effectiveness and productivity of innovation process is the result of successful innovation and technology management.

The Hong Kong government has long adopted a "laissez faire" policy and has been reluctant to interfere too much in industry development. In response to the pressure from the industry, they adopted an "Input-thinking" approach by injecting funds on various ends to facilitate industry development. However, since it is a piece-meal effort instead of a coherent effort with a vision for the future, the processes are not properly managed. The fact that the government had neglected the importance of streamlining the processes, and the lack of a proper organizational structure in policy formulation reflects the "Input-thinking" nature and leads to duplication and ambiguity, resulting in ineffective use of resources.

Hong Kong has been rather late in formulating innovation policies. While the other "Tiger or Little Dragon" economies⁶ have caught up with the trend to upgrade their economies with visionary innovation and technology development policies in the 1980s, Hong Kong developed a

⁶ Sharif, N. and E. Baark (2005). "The tamest of tigers? Understanding Hong Kong's innovation system and innovation policies." *International Journal of Technology and Globalisation* 1(3/4): 462-479, 18p.

formal and coordinated innovation policy for the first time only in 1999⁷ upon the publication of two landmark reports by the Commission on Innovation and Technology (CIT).

Subsequent to the issue of the two CIT reports, the Hong Kong government adopted many of the recommendations and launched a series of initiatives trying to demonstrate its commitment to innovation and technology development in Hong Kong. Strategically, Hong Kong government set up an inter-bureau policy group and also a standing advisory body to foster innovation and technology development. However, as the government's efforts were still confined within the context of "Input-thinking", the added resources input did not necessarily transform into more productive outcomes. For example, the partially overlapping roles of the Cyberport and Science Park in attracting overseas tenants and conducting extensive marketing activities in advanced industrialized countries have unavoidably introduced unproductive and inefficient resource allocation⁸. To catch up with other technology and innovation leading economies, especially the progress made in the other three of the four "Little Dragon" economies, it is necessary to review and revise Hong Kong's current innovation and technology policies.

E. Leveraging the "Extended Open Innovation" Business Model – The New Policy Framework

The underlying policy focus for the initiatives is that government could never have better senses than the private sectors in terms of the needs for innovation and technology development. However, the perpetuation of a "laissez faire" policy would make Hong Kong lose its long term directions. In order to strike a balance, government should provide a clear policy directive showing its commitment to innovation and technology development in the long run while leaving industry and universities to decide what innovation and technology are required to be developed over time. In other words, the government provides a solid stage on which different kinds of performances could be hosted.

On the basis of Hong Kong's innovation and technology policy review, we propose the following policy recommendations:

⁷ Sharif, N. and E. Baark (2005). "The tamest of tigers? Understanding Hong Kong's innovation system and innovation policies." *International Journal of Technology and Globalisation* 1(3/4): 462-479, 18p.

⁸ Baark, E. and A. Y. So (2006). "The Political Economy of Hong Kong's Quest for High Technology Innovation." *Journal of Contemporary Asia* 36(1): 102-120, 19p.

1. *Thin Institutions*

Streamlining the institution arrangement and the relevant processes can create an enabling environment to cultivate innovation and technology development. On the basis of our study, the following suggestions are proposed:

Firstly, the high-level Steering Committee on Innovation and Technology currently chaired by the Secretary for Commerce and Economic Development should be retained. However, the chairperson should be changed to the Financial Secretary to highlight the importance of innovation and technology development.

Secondly, the Innovation and Technology Commission (ITC), currently under the Commerce and Economic Development Bureau (CEDB), should be spin off from CEDB and upgraded to Bureau level which specifically takes care of innovation and technology issues. Since innovation and technology related activities are embedded in a wide variety of government policies, it may not be feasible to take all the innovation and technology related elements out and centralize in the newly formed Bureau. However, the newly formed Bureau could provide policy directives and take lead to coordinate the policies associated with innovation and technology development area. The size of the Bureau should be thin such that it focuses purely on policy issues instead of being sidetracked by operational issues.

Thirdly, the various existing institutions related to innovation and technology development should be grouped into three functional areas, namely facility support, funding support and consultancy support.

- a. For facility support, the Hong Kong Science and Technology Parks Corporation (HKSTPC) and Hong Kong Cyberport should be merged so as to centralize and simplify the management of facility-based resources for advocating innovation and technology development.
- b. For funding support, UGC and RGC should remain as they are now. The Applied Research Fund (ARF), which has ceased making new investment since March 2005, should be integrated into Innovation and Technology Fund (ITF) to centralize and simplify the funding allocation processes. In addition to public funding, Hong Kong

government should leverage the advantage of Hong Kong as a regional centre for Venture Capital (VC) centre and facilitate industry to source funding from the VC for innovation and technology development.

- c. The proposed mergers under facility support and funding support areas represents a major effort to streamline the institutional infrastructure to avoid confusion, especially for SMEs.
- d. For consultancy support, including technology commercialization and transfer, the Hong Kong Applied Science and Technology Research Institute (ASTRI), Hong Kong Productivity Council (HKPC) and Hong Kong Design Centre (HKDC) should be merged to form an InnoBridge Centre (IBC) to serve as a bridge among the government, the industry and universities to commercialize and capitalize the R&D efforts. In addition to centralizing the consultancy support currently being provided by different institutions to avoid fragmentation, the IBC is positioned as a bridge to help industry to tap into the research results of universities and facilitate industry (especially SMEs) to establish fruitful interaction with universities. The ultimate target is commercialization of research output. While the government should provide the initial funding, given the strategic positioning of IBC, it should be operated on a commercial basis. The source of revenue should be the consultancy fee received from successful commercialization projects and possibly the remuneration arising from the successful commercialization and sale of research outcome. This aligns the interests of the participating parties (industry, universities and IBC) together such that IBC could sustain its survival by creating a win-win situation for all. This operation model should provide IBC with a substantial incentive in playing its bridge role successfully. Another important role the InnoBridge could play is to fill the gap between the stringent vetting requirements of VC and the R&D efforts of the industry and universities.
- e. The facility and funding support involves the management of resource input while the consultancy support is a coherent effort in process streamlining. The restructuring of the institutions would serve as a basis for Hong Kong to transform from an “Input-thinking” mode to an “Output-thinking” mode. With the paradigm shift, a foundation could be laid to facilitate “Open Innovation”.

Fourthly, the existing research centres under the respective focus research areas should be spinned-off to industry and universities. In the new framework, the focus should go beyond the existing University-Industry Collaboration Programme (UICP) under the ITF such that universities should become the major R&D arm of the economy, while the industry is encouraged to deal with the proposed IBC to establish cooperation with local and/or overseas universities and research institutions. The current UICP confines the cooperation of private sector to Hong Kong universities only. This should be relaxed to allow Hong Kong companies to establish cooperation with both local and overseas universities and research institutions to maximize the benefits of “Open Innovation” and globalization.

In this regard, the institution arrangement could maximize the energetic characteristics of private sector while providing the necessary facility, consultancy and funding support to make R&D feasible for all kinds of organizations including SMEs.

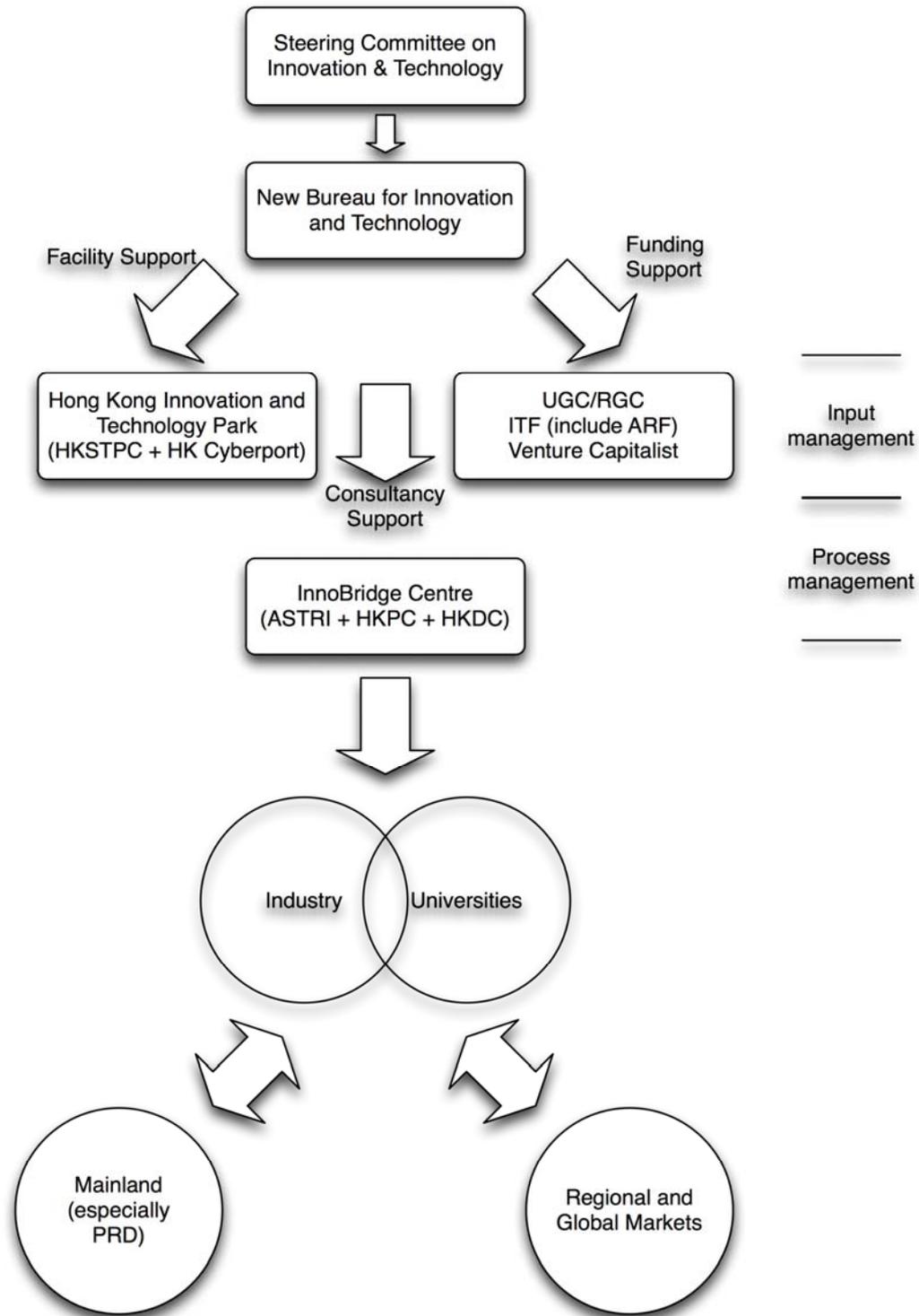


Figure 9 The proposed framework of Hong Kong's innovation and technology infrastructure



2. *Innovation Hub*

The concept of Innovation Hub expresses a vision for a centre of exchange for innovation activities⁹. This can be illustrated from two perspectives.

Firstly, Hong Kong can be a hub for innovation resources such that exchange for innovation management and commercialization services could be conducted here. The solid legal and financial framework and well-trained business experts with globalized vision are concrete foundations based on which substantial additional value could be created for innovation management and commercialization activities. This is illustrated in the “Commercialization” session in the Extended Open Innovation Model.

Secondly, Hong Kong can be an exchange for innovation output – intellectual property exchange. The simple tax system, concrete legal framework, uncorrupted government and world class information technology infrastructure¹⁰ in Hong Kong forms a good foundation to carry out this kind of activities.

3. *Providing Incentives - Process Streamlining and Others*

For process streamlining, we propose that the newly formed Bureau should review the existing policies and regulations relating to the innovation and technology development and take lead in streamlining the processes involved so as to reduce the barriers for the industry, especially SMEs, to participate in R&D activities. Creating a facilitating environment by streamlining the processes in various aspects of innovation and technology development such as funding application and patent application, etc. could not only effectively help local companies to engage in R&D but also help improve the environment on which overseas companies could be attracted to participate in intellectual properties exchange activities in Hong Kong.

Apart from process streamlining, providing tax incentive is also a very effective way to encourage local companies to do R&D and provide a good environment for building a strong intellectual property exchange.

⁹ Baark, E. and N. Sharif (2006). "From Trade Hub to Innovation Hub: The Role of Hong Kong's Innovation System in Linking China to Global Markets." *Innovation: management, policy and practice* 8(1-2): 193-209.

¹⁰ Carney, M and E. Gedajlovic (2000). "East Asian Financial Systems and the Transition from Investment-driven to Innovation-driven Economic Development" *International Journal of Innovation Management* 4(3): pp. 253-276.



Given the innovation and technology development requires well-trained talents, Hong Kong government should further enhance the local tertiary education by providing more resources for R&D activities and also attract talents from overseas to study and work in Hong Kong. The expansion of talent pool would provide companies wishing to engage in R&D with higher quality at the proximity.

4. Synergy with the Mainland

As shown in the Extended Open Innovation Model analysis, Hong Kong is especially good at the commercialization of innovation and technology development processes while that is the major insufficiency of innovation and technology development in the Mainland. In this regard, a similar synergy could be created as in the case of the manufacturing regime. Hong Kong could serve as a marketing frontend for the Mainland innovation and technology and at the same time an innovation hub to provide advanced innovation exchange between the Mainland and the global markets. In addition to the existing initiatives including the Mainland/Hong Kong Science and Technology Cooperation Committee, the Pan-PRD Joint Conference on Regional Cooperation in Science and Technology, the Guangdong/Hong Kong Expert Group on Cooperation in Innovation and Technology, and the Steering Group on Shenzhen/Hong Kong Co-operation in Innovation and Technology, the newly formed Bureau could deepen the cooperation further for a win-win situation where additional values could be created from the synergy. For example, the industry-university cooperation could be extended to include universities and research institutes in the Mainland to expand the source of “Open Innovation” on the one hand, and foster competition between local universities and Mainland universities for higher quality technology transference.

5. Cultivating an Innovation Culture

“Innovation culture” is to be understood in terms of attitudes towards components related to the innovation process, for example, innovation, technology, exchange of knowledge, entrepreneurial activities, business, uncertainty, and related behavior and historical trajectories.¹¹

¹¹ Hofstede, G. (2001) *Culture's consequences – comparing values, behaviours, institutions and organizations across nations*, London: Sage Publications.



An environment of psychological safety and freedom could increase the courage of individuals to take the risk of innovation. Government should educate people that many ideas will fail before one can be commercialized. Government should also try to establish a culture in which people will learn from failure rather than avoiding it or even blaming it. One important way of signaling that something is important is by rewarding it.¹² Therefore, innovation award system could be established to encourage people to take the risk. More flexible research environment should be provided to the research centers and universities. The research funding should not just be provided to the hot topics but also some creative projects with high risk of innovation.

Hong Kong's business people are popular for their entrepreneurship. However, as innovation and technology management is a new subject, while most SMEs have no resource to obtain such knowledge, the InnoBridge should make use of the General Support Programme (GSP) under the ITF as funding source for offering training on innovation and technology management (especially to SMEs) including topics such as intellectual property management, open innovation, and user generated innovation.

The government should also act as a show model of openness. For example, government sponsorship can go to foreign companies as long as these companies have registered in Hong Kong and the outcome will benefit Hong Kong. The government can also sponsor projects a Hong Kong registered companies when they conduct joint research with overseas parties, such as universities in the mainland of China. In addition, the government should also take lead in adopting relevant innovation in its own operations.

We believe the above policy initiatives will effectively facilitate Hong Kong's innovation and technology development by leveraging the emerging "Open Innovation" model. Hong Kong's industrial sector as well as the economic structure will experience another paradigm shift, namely from "Made by Hong Kong" to "Innovated by Hong Kong", if it is able to participate in the global-wide "Open Innovation" system.

¹² ML Tushman, CA O'Reilly. (2002). *Winning Through Innovation: A Practical Guide to Leading Organizational Change and Renewal*. Harvard Business Press

