

Towards a Step-by-Step Approach to Developing a Knowledge-Based Economy In Hong Kong

**Gordon McConnachie &
Alan K. L. Lung**

Asia Pacific Intellectual Capital Centre

Sharon Gal Or

Israeli Chapter of
the STARS Foundation

A prime role for any Government in the age of a developing knowledge-based economy (KBE) is to promote, encourage and stimulate participation across all sectors in this KBE: the HKSAR Government has made some promising moves in this respect but there still remains much that can be done when we compare regional economies such as Japan, Singapore and South Korea.

The story to be told in this paper is about Hong Kong's political economy—how to build the institutional support and the political consensus needed to move forward Hong Kong's economic transformation into a high value-added knowledge-based economy.

The HKSAR Government said it will target economic development. "This government wants to be proactive," said C.Y. Leung after the first meeting of the Economic Development Commission held on 13 March 2013. Mr. Leung also acknowledged Hong Kong's uniquely separate legal and administrative structure under "One Country, Two Systems" in the economic development section of his election manifesto. From his viewpoint as the Chief Executive of Hong Kong, there is a strong desire to create high-value-added jobs expected by the highly educated younger generation.

There is a general consensus that the Hong Kong economy needs to diversify from heavy reliance on the financial services and property sector. In April 2009, "Six New Industries" were proposed by The Hon. Donald Tsang and there was an attack from the Hong Kong General Chamber on this sector biased approach to economic support.

In papers published in 2011 and 2012, the Asia Pacific Intellectual Capital Centre had suggested that Hong Kong should seek a new role in the context of a rising China and the globalised Knowledge-based Economy. Tam, at the time a Member of the Legislative Council of Hong Kong, in a newspaper article in 2012 proposed the formal recognition of a Guangzhou-Hong Kong Knowledge Corridor. A South China Morning Post editorial (SCMP 15 April 2013) also noted Hong Kong's unique advantages: free economy, first-rate infrastructure and low tax rates. The same editorial, however, suggested "... lack of entrepreneurship" as the primary cause of the slowdown in Hong Kong's economic progress. SCMP claimed that no one had studied the subject of entrepreneurship in Hong Kong. Yet Getz and Segal (2008) in an Israeli study ranked Hong Kong as number two in the world in terms of "Overall entrepreneurship ranking." Hong Kong was ranked just behind Iceland (which went bankrupt after the Global Financial Crises) and was ahead of Israel, Taiwan, USA, Canada, Ireland, Australia and Singapore.

There were strong hints from the Central Government¹ suggesting that in moving forward Hong Kong's economic transformation into a high value-added knowledge-based economy, Hong Kong should put emphasis on implementation and try to make things happen. Hong Kong, however, has yet to develop a sound intellectual argument and a sound strategy. We still do not have practical SME support policies that link Hong Kong SMEs to their counterparts in the rest of the world that are anxious to use Hong Kong as a bridge to do business with China in the area of innovation and technology.

At the end of the day, Hong Kong has to look more closely at its own prospect for long-term economic survival. In coming up with a new "Political Economy"² to support Hong Kong's next stage of economic development, we need to be proactive. Consensus must be built in the local community on whether Hong Kong should invest in innovation and technology. At this moment, there is close to nothing in between the high-level macroeconomic goals of economic development and high-end job creation and implementation at the ground level. The tasks ahead are not straight forward ones as Hong Kong cannot rely on the policies handed down from the Central Government in Beijing—mainland policy measures may not work in the free market economy of Hong Kong. Now the British are gone, it is not politically correct to copy the UK model either. Hong Kong is a local government of China from a political perspective. But it is also a separate economic entity the size of a small country in Europe. In 2012 Miller and Côté showed that there is no one-size-fits-all strategy for successful innovation: Hong Kong must find its own, unique solution.

If the answer cannot come from the UK or from mainland China, the reasonable way to seize this opportunity is for us to come up with answers from within Hong Kong. However, we need to have a good understanding of the economic goals, transformation and implementation processes of the relevant OECD countries³ since the early 1990s. Then we need to apply the knowledge and come up with strategy, community consensus, support from the Legislative Council and specific implementation steps to make things happen. Nothing will happen unless we can come up with a clearly stated strategy, coordinated policies and some practical implementation steps, even in the absence of an Innovation and Technology Bureau.

Why Should Hong Kong Diversify Through a Knowledge-based Economy Strategy?

The argument is made in this section that, in order to diversify and grow its economy, Hong Kong should diversify horizontally, placing emphasis on knowledge-based innovation in any sector of business, and that this should be a strategic aim of HKSAR Government policy.

OECD acknowledges the link between knowledge-based economy and creation of high-wage and high-quality jobs. OECD also links productivity to the rate of knowledge accumulation and identifies the need to have sound government policy in place to make things happen. As described by Lung in a 2012 SCMP Opinion Page, this knowledge-based economic development strategy, however, seems to lie in the "I don't

know that I know" portion of Hong Kong's collective intelligence. Hong Kong does not seem to recognize its own potential and has so far failed to find a strategy for the much needed economic diversification and creation of high-end jobs expected by the younger generation. Suspicion of this economic development mode based on intangible knowledge assets has put considerable uncertainty on Hong Kong's prospects to become one of the leading knowledge-based economies of the world.

Hong Kong has always been about free trade, "good law, well administered" and a strong belief in the "free market" principle. We have always thrived on new ways of thinking and doing things. We have all the basic conditions needed to make things happen, yet we don't seem to recognize that we are already a developed economy and the game-changing opportunity must be based on innovation and action, not on suspicion of the unknown, dogmatic adherence to "lines-to-take"⁴ indecision and inactivity.

Hong Kong's own innovation system — linked to but separate from the national systems

"Knowledge-based Economy" is not just about R&D and the pursuit of knowledge in universities. It is also about making money and economic development. It is not a novelty in OECD countries. It has also been a proven economic development strategy amongst many OECD countries since the early 1990s. Implementation of such a strategy does not contradict Hong Kong's traditional free market philosophy, nor is it about "Central Economic Planning." Instead, it is about having a strategy, coordinated public policies and practical facilitation measures that focus on helping all industries—not selected sectors of the economy that have successfully lobbied the HKSAR Government for support—to engage in more high value-added economic activities.

A difficult task is ahead for Hong Kong as the Innovation & Technology Bureau proposed by the C.Y. Leung administration just before July 2012 did not happen. The Innovation and Technology Commission (the unit that is currently taking charge) is essentially a department under the Commerce and Economic Development Bureau of the HKSAR Government. A comprehensive strategy-making and funding unit equivalent to the TEKES of Finland is essentially missing in Hong Kong. Unlike Korea, Taiwan and Singapore, Hong Kong had not really thought of innovation and technology before 1997. The short burst of enthusiasm led by Mr. C.H. Tung and the push toward the construction of the Hong Kong Science and Technology Park did not lead to a fully developed innovation and technology capacity in Hong Kong, but even in the absence of a policy making unit, the HKSAR Government still needs to invent an intellectually sound economic development argument and needs to gain broad community support for a separate innovation system that is linked to, yet separate from, the national innovation system of China.

In the more developed economies around the world today, innovation and technology policies are understood in the context of a system.⁵ Different players, including non-technology actors, need to interact under a complex and increasingly

globalized system to make things happen. The technology-push (or supply-push) and university-industry cooperation as practiced in Mainland China cannot be easily adopted in Hong Kong because firstly, it may not work. In a free market economy, the government does not have control over economic activities and such a model may not work in Hong Kong. Secondly, good science and technology does not necessarily lead to innovation and commercialization. Thirdly, it is now understood that policy makers need to look beyond input of R&D resource, and also consider social, economic and geographic interaction of those resources and the management of those resources. In Hong Kong's case, those links and interactions must be built with mainland China and with the rest of the world.

There is no simple answer for Hong Kong. We cannot simply copy China's system or the UK's system. Instead we need to build our own "Sub-national Innovation Eco-system" (HK-SIS) that is linked to but separate from the China National Innovation Eco-system (China-NIS). At the same time, HK-SIS must be integrated into the innovation eco-systems of the OECD countries. This Sub-national system (HK-SIS) to be built in Hong Kong is not unusual nor a special case within national boundaries of countries around the world. There are similar situations in Canada, USA and South Korea. But it will be a rather unique case for Hong Kong as we will have the opportunity to make use of Hong Kong's difference from the national innovation system of Mainland China (China-NIS) to create a substantial external economy of scale and economic benefits for Hong Kong and for China. As Hong Kong is a very open economy, these benefits for Hong Kong can be used by the OECD countries around the world that are happy to use Hong Kong as a gateway for economic cooperation with China in the innovation and technology areas.

Political economy lesson from South Korea — From "catch-up" to "creative" development

This change in focus was reported by Keenan in 2012 and a political commentary⁶ has noted that the economy—not North Korea, will be the newly elected President Park Geun-hye's biggest challenge. Relatively few people in Hong Kong have noticed the establishment of Park's Ministry of Science Future Planning and Korea's shift from the emphasis on "catch-up" (i.e. as a less developed country) to a "creative" mode of development (i.e. as global leader amongst the OECD countries). At the core of this shift in national development strategy is the shift away from supporting the "Chaebols" (large family-owned business conglomerates) of the old economy to the emphasis on trying to create economic growth through knowledge-intensive SMEs.

The main task ahead of Park Geun-hye is Korea's economic convergence with the more advanced OECD countries and ending the dependence on a long history of economic growth started on the basis of providing cheap capital to the "Chaebols" by former president Park Chung-hee (Park Geun-hye's father) and exploitation of the labour force. As the second largest developed economy in Asia after Japan, South Korea can no longer rely on the traditional mode of "input-based" economic growth. Even though Korea has already been applying innovation and technology in industries, such a

shift in direction is still a difficult political task as it will involve the realignment of supporting institutions, new government structures and new rules of engagement between government and businesses. To make things happen at the ground level, South Korea will have to: develop the appropriate skills needed, strengthen the SMEs, increase and realign R&D spending and promote internationalization.

Policy makers in Hong Kong should take note that Korea has formally abandoned the "catch-up" mentality and is beginning to think of itself as a global leader of the world's economic development. To achieve this, Korea policy makers have decided that a change in the political economy rules (i.e. the Meso-economics) is a necessary step in changing the Marco-economic structure. There will be a shift away from an economic support policy centered around government-affiliated research institutes and the "Chaebols". Instead, Korea has decided to rely on the strength of knowledge-intensive SMEs as a primary source of economic growth. This is a strategic shift at the national level and fortunately for Korea, there are signs that the "Chaebols" are becoming more supportive of the SMEs as they found they could make good use of the SMEs as a source of innovation.

Strengthening the innovative capacity of SMEs

Hong Kong started as a trading port and later became Asia's financial centre. Hong Kong has always been about trade but its membership as one of Asia's four "Asian Dragon" and one of the five developed economies of Asia (along with Japan, Korea, Taiwan and Singapore) is not primarily based on innovation or the growth of knowledge-intensive SMEs. Korea's economic development history and model are not something that could be duplicated easily in Hong Kong. Korea is clearly very far ahead of Hong Kong in terms of its R&D capacity and their strengths in specific industrial sectors, such as heavy industries and electronics. However, Hong Kong probably has a more international outlook and as we move forward in charting Hong Kong's economic future, policy makers in Hong Kong should be able to get some clear lessons and insights from South Korea's shifts in its political economy strategy.

One of those insights Hong Kong should take note of is that generating economic growth through knowledge-intensive SMEs is what "Silicon Valley" is about. The shining Asian example of this mode of economic development is Taiwan. This "New Economy" strategy of trying to put innovative SMEs at the centre has been adopted not just by Korea, but by many OECD countries. It was observed that industries in Hong Kong have been "hollowed out" by extensive moves of Hong Kong's manufacturing industries into mainland China in the late 70s and 80s, primarily for costs reasons. Many of those SMEs that have not invested in technology or build up their own brand and distribution network now find it difficult to survive in low profit margin OEM manufacturing.

The Economic Development Commission established by the HKSAR Government will probably come up with a new SME support policy. A policy of picking and factors

predicting winners or using quasi-government agencies to support certain industrial sectors at the expense of others is not helpful, nor is it a feasible solution. The key success factors of the future Hong Kong SME policy ought to include a horizontal industry support policy. Hong Kong needs to provide support to all knowledge-intensive SMEs— including SMEs in the service sector as they are the source of many innovative ideas and economic development capacity to other industrial sectors of the economy. All the fundamental conditions needed to build a knowledge-based economy in Hong Kong are already there. Hong Kong does not need a miracle to make things happen. Some clear-headed thinking and small policy adjustments will do.

Winning the Political Argument for Offering Proactive Support to Economic Development

In this section the advantages and disadvantages of proactive support to economic development are considered in the context of Hong Kong: the main underlying conclusions are that it is necessary to provide cogent political arguments for providing this support and that the HKSAR Government has a key role to play.

The most recent Budget Speech announced on 27 March 2013 by the Financial Secretary probably reveals the real difficulties in engineering a new economic development strategy for Hong Kong over the next decade. It also shows a weakness in the intellectual foundation of the economic development policy of Hong Kong. It seems that the HKSAR Government genuinely cares about the "Freest Economy in world" rating given to Hong Kong by the Heritage Foundation and Cato Institute of the USA. Former Hong Kong Monetary Authority (HKMA) official Tony Latter⁷ in 2007 has pointed out the strong dose of "tycoonocracy"—the strong influence of large local business conglomerates in the policy-making process of Hong Kong's economic and social development. The HKSAR Government, however, also sees itself as a broker of policies and therefore, can be swayed by popular opinions. The cumulative effect is, fifteen years after Hong Kong's return to China, there is no strong signal that the HKSAR Government would be able to come up with a coherent economic development blueprint that could hold up against vigorous testing from the "purist" supporters of the free market and other public opinions that have strong "socialist" tendencies.

"Free Market" versus "Economic Planning"

The HKSAR Government should recognize the Knowledge-based Economy potential of Hong Kong. In a free market economy such as Hong Kong, the government does not have direct control over economic activities. It cannot predict the winning industries or where the next burst of economic growth might come from. Policy makers within the government of Hong Kong have always admired John Cowperthwaite (Financial Secretary, 1961-1971) and his "Positive Non-Intervention" economic development philosophy. However, Hong Kong does not seem to fully understand the "Positive" part of Cowperthwaite's philosophy—that is government must not stand still and must do as well as it possibly can to facilitate economic development. It should be

noted that the governments in Hong Kong have always tried to facilitate. Hong Kong has always thrived on new way of thinking and doing. We should not hang on to dogma or on to success of the financial services industry only. As a high-cost economy, Hong Kong does not have any choice but to follow the examples of OECD and European Countries in climbing up the economic ladder.

Considerable political leadership is needed to make maximum use of a high level of autonomy under "One Country, Two Systems" in Hong Kong's economic development process. Inspiring hope and providing opportunities for the next generation will involve developing an economic philosophy that would be supported by the vast majority of Hong Kong's population. It will be a process of creating new ideas and not about sticking to old rules of doing things and the political dogma of free market economics. High-level macro-economic goals: job creations, quality economic growth and wishes for Hong Kong to do well need to be translated into practical action on the ground.

Liberalize the economy by supporting young entrepreneurs

Hong Kong needs a good understanding of what it takes to build a knowledge-based economy based on a more liberal economic structure that provides real economic growth and advancement opportunities—particularly for the more educated youth who have high expectations for their future. Inspiring hope comes from political leadership and the ability to communicate vision and is also about winning the political argument for proactive support of economic development in the context of a globalized knowledge-based economy. We need to recognize that fostering economic development is not just about "Input Economics"—allocating money or resource against stated macro-economic goals. It is also about "Meso-economics"—knowing about institutions and rules of engagement between government and industries that have direct effect on the "Output" and therefore "Outcomes" of public policies.

Post-World War II economic growth of South Korea and Finland relied heavily upon accumulation of capital in the "old" industries. In the case of Finland, it was the exploitation of raw materials, particularly forestry and a "Pulp and Paper" economy. The Korean "Chaebol" model was essentially a copy of the "Zaibatsu" model of Japan's industrialization process from the Meiji Period to the end of World War II. Both Finland and Korea have a highly educated and technology-oriented population. Both of these two economies were able to make good use of innovation and technology to transform through intensive use of knowledge and technology since the mid-1980s to early 1990s, which is quite recent in economic development terms.

In today's Hong Kong, policy makers need to acknowledge that economic development policy that relies on the accumulation of capital and assets may not be the best growth strategy for Hong Kong. The accumulation of capital implies an oligopoly of the market and economic opportunities (e.g. in the financial industry, real estate development and port facilities). Such a development mode implies that very large business conglomerates will seek maximum profit from capital investment. Such "rent"

seeking behavior sometimes works against the interest of other sector of the economy and the wishes of the majority of the population that believes Hong Kong was built on a foundation of equal opportunity and liberalism.

One way to further liberalize Hong Kong's economic development is to seek to create a more liberal capital formation structure—bearing in mind that in today's world "capital" includes intangible "Knowledge Capital" as well as "Financial Capital" that are needed to create economic wealth at the company or micro-economic level. Hong Kong prides itself as a rule-based society that relies on a level-playing field and fair play. Adopting a strategy of investing more of Hong Kong's wealth into education, an innovation eco-system and supporting young people who have entrepreneurial skill and science and technology knowledge is an intellectually sound and politically defensible economic development strategy. This strategy has been taken up by many OECD countries and should be adopted by the HKSAR Government.

Focus on creating economic growth through SMEs

The globalized knowledge-based economy as we know it today first happened in the USA and Europe in the early 1990s. Hong Kong had not paid attention to it as it was a period of time when Hong Kong was preparing for a change from British rule to Chinese rule. Even though Mr. C.H. Tung, the first Chief Executive of Hong Kong (1997-2004) did try to inject innovation and technology as an economic growth engine for Hong Kong, the policy was not further developed in Sir Donald Tsang's administration (2004-2012). This was probably because the second Chief Executive of Hong Kong did not believe in such a policy direction.

Opponents of innovation and technology often criticize Mr. C.H. Tung for focusing on a policy of picking winner, rather than providing a business environment where winner would be selected by market circumstances. Proponents of such a free-market policy probably err on the side of a Free Market "Purist" opinion as such an approach ignores the fact that the SMEs of smaller economies such as Hong Kong do not have the same resources or expertise as the Multinationals of the USA or Europe. It also ignores the reality that even the developed economies of Europe—particularly the smaller economies that are about the size of Hong Kong—recognize that there is a market failure and SMEs need facilitation to move up the value chain. In the complex and highly competitive world of a globalized knowledge-based economy, no government can afford to watch the world go by without providing clearly stated policy and the necessary support measures to SMEs to upgrade themselves.

Hong Kong may have become less confident in itself since 1997. Some say that Hong Kong has lost its entrepreneurial spirit. Others blame it on a divisive and belligerent legislature and Hong Kong's uncertainty over its on-going political development. Hong Kong has been practicing a fairly hands-on approach to economic development but could do much better if the HKSAR Government recognizes our own unique strengths and implements sound policy decisions based on sound strategic analysis confidently and consistently.

Building Hong Kong's Innovation Eco-system

In this section the case is made for taking a long, hard look at Hong Kong's Innovation Eco-system and for taking significant steps to simplify and provide readily accessible information and support. This role of promoting, encouraging and stimulating companies, particularly SME companies, in their entry into participation in the KBE is, as can be seen from simply looking at the most developed nations, a role for Government.

An innovation eco-system is the environment— institutions, rules, regulations, internal and external relations under which entrepreneurs and investors of an economy operate. It is also an implementation strategy of offering highly focused support to knowledge-intensive SMEs as a long-term economic development strategy. An innovation eco-system includes the key success factors that need to be present so that an innovative economy can emerge. An important component of the innovation eco-system is government policy that considers corrective measures for market failures, including the ones faced by many in Hong Kong in our economic transformation process.

Innovation is more than R&D

Broadly speaking, Hong Kong needs to understand and focus more attention on the conception, design, creation and implementation process for knowledge-intensive products and services. An analysis of the innovation eco-system of Israel (Avidor, 2011) reveals that a successful innovation eco-system encompasses many factors, but they can be grouped into four categories:

1. Economic incentives and institutional support: the expected return to the investor must be positive, otherwise, he or she will not invest in the project. In developing economies, many factors can cause negative return on investment, such as the cost of capital being too high, weak financial infrastructure, weak manpower supply, a small market, lack of entrepreneurial skills or poor intellectual property rights protection. Hong Kong probably rates quite well in the area of providing economic incentives. There is the issue of Hong Kong being a "small market", but this issue could be overcome through CEPA (Closer Economic Partnership Agreement) and other formal and informal social and economic cooperation with Mainland China.
2. Availability of financial capital and an effective innovation system: Venture capital typically plays a very limited role in Early-stage Technology Development Funding (ESTD) around the world, particularly in Hong Kong. According to a study made by Auerswald and Branscomb in 2002, venture capital only accounts for 5% of ESTD Funding in the USA. The rest came from: universities 3%; government 27%; angel investors 27%; internal corporate sources 39%. The HKSAR Government currently does not provide angel funding and the capacity provided by angel investor is also small in Hong Kong. ESTD is one of the major issues Hong Kong needs to overcome. There are proven models in Finland and in Israel, such as

YOZMA,⁸ where the public sector shares the risk with private sector investors and is able to recapture the public funds invested, but implementation of such models will be a major shift in direction for Hong Kong.

3. Supply of human capital: Hong Kong does not have all the engineering and scientific skills needed. However, this shortcoming is compensated by Hong Kong's international outlook, an open economy, links to Mainland China under "One Country, Two Systems" and strong skills in commerce and finance. Further investment in knowledge intensive industries and innovation and technology will create jobs expected by the local graduates and will also attract talents from Mainland China and from around the world to come to Hong Kong.
4. Access to information and a modern information infrastructure: Hong Kong scores well in the access to information factors. Press freedom, a liberal political environment and use of English as the primary business language are important but fairly under-rated competitive advantages unique to Hong Kong. The internal and international links between inventors, academics, technology evaluation experts, investors and industrial practitioner are still missing as an economic development capacity that needs to be built up. However, Hong Kong has always been extremely good at networking; this knowhow and capacity deficit is not a fundamental weakness and could be overcome fairly easily if there were clearly stated policies from the HKSAR Government.

In the past ten to fifteen years, governments in South Korea, Taiwan, Singapore and Israel have responded by adjusting their systems to a changing environment. Somehow, the HKSAR Government will also have to respond with the right policy measures even in the absence of an Innovation and Technology Bureau. Other than "Access to Information" and "Economic Incentives", Hong Kong also ranks high in terms of Intellectual Property Rights Protection. "Human Capital" and particularly the availability of "ESTD" (Early-stage Technology Development Funding) are the weaker links. All of the above factors will need further refinement and alignment if Hong Kong is to have an effective innovation eco-system.

Focus on Hong Kong's market niche — internationalization and the last 10% of R&D

Hong Kong would be wise not to try to duplicate what Mainland China and the rest of the world are already doing. The "National Innovation System of China" (China-NIS) deployed in Mainland China is primarily based up massive mobilization of government resources on science and technology on a scale and speed that Hong Kong could not possibly match. In 2008 an "OECD Reviews of Innovation Policy: China" observed that the massive investment made by China has not yet translated into a proportionate increase in innovation performance. The "Hong Kong Sub-national Innovation System" (HK-SIS) is still composed of government, university and industry. But the HK-SIS should try to cooperate with the China-NIS and the NIS of the rest of the world.

In this respect, Hong Kong would particularly be useful in:

1. Providing a platform for China to "Go Out" and international enterprises to "Go in": Hong Kong possesses a well established legal and administrative system, free access to information and a liberal free thinking environment needed by the Mainland as their convergence with the world's innovation system continues to develop. Developed economies of the world want to use Hong Kong's separate legal and administrative system as a gateway and bridge to do business with China;
2. Providing the service capacity for Chinese enterprises: Hong Kong has a niche role in making best use of its strong service sector capacity and international connectivity and help to improve the innovation performance of the China-NIS, in both effectiveness and efficiency terms. Such a strategy has been clearly stated in China 12th Five Year Plan and would be supported by mainland governments and enterprises;
3. Commercialization: Hong Kong should try to understand the demand side—what the China-NIS and the rest of the world want from the HK-SIS. One element for Hong Kong is to focus on the last 10% of R&D that leads to commercialization of science and technology from Mainland China and from around the world. Hong Kong is ideally placed to do this type of work because of our international outlook and strong expertise in commerce and industry.

The Hong Kong SAR Government is unlikely to follow the example of the Israel's Office of the Chief Scientist (OCS) in funding 50% of private sector R&D (60% for start-ups). As a newcomer to the field of innovation and technology Hong Kong cannot match the scale and depth of the China-NIS and the USA-NIS. There is no demand for military technology so there is no military R&D in Hong Kong. The opportunity for civilian application of military-sector R&D done within Hong Kong does not exist—but such applications do exist for commercialization of military R&D done outside of Hong Kong.⁹ It is difficult, if not impossible, for Hong Kong to catch up with the institutions and experience built up over the least thirty to forty years in Taiwan, Korea, Finland and Sweden within a few years. This is why finding and focusing on a specific market niches are important as Hong Kong will need to build its own innovation eco-system as the Hong Kong Sub-national Innovation System (HK-SIS) of China. The answer probably is: focusing on "commercialization", "Internationalization" and the "last 10% of R&D".

Review the Meso-economic structure—institutions, rules and regulations

The British Hong Kong Government before 1997 basically provided the legal and administrative framework that enables businessmen to get on with the business of making money. One of the hallmarks of British rules in Hong Kong was certainty and predictability of government policy. At a practical level within the civil service, those government policies inherited from the days of British rule have been transformed into a set of rules and regulation and a memory of what were the "lines" taken in the past.

One of those "memories" ("lines-to-take" or political economy rules) that needs to be changed must take account of the fact that the support deployed by the HKSAR Government and the Hong Kong-SIS can no longer be based on the "supply side" alone. The HKSAR Government can no longer rely on the traditional budgetary approach of allocating resources alone and hoping that things will work out. The existing innovation eco-system has many unconnected "dot" or initiatives, but they do not necessarily connect into a line. Political leaders of post 1997 Hong Kong need to know when rules become a dogmatic process and which rules can be changed, so that the dots can be connected to become coordinated policies. This approach is about knowing "what are the right things to do", not just "doing things right" and it involves advanced political skills that require knowledge and how to make sensible policy choices.

Political leaders in Hong Kong are now fully expected to demonstrate that they have the political skill and ability to change the rules of engagement between the government and the public when appropriate. For example, we already know that Hong Kong is unlikely to be dogmatic about non-intervention, but we should also be aware that the innovation eco-system of China (China-NIS) cannot be blindly fitted into the Hong Kong circumstances either. A comprehensive study published by the OECD in 2008 and referenced above has concluded that China needs to shift from a sustained (by government investment) to a sustainable growth mode. This report also highlighted: "... the importance of broad-based framework conditions for innovation for building a market-based innovation system." There are many issues within the current China-NIS that need to be solved, and they include: role and performance of China's public research institutes, relationships between the China-NIS and globalization of R&D and governance issues.

Attempts by the HKSAR Government to change the industry support rules will have to be carried out in a convincing and confident manner. Since neither the option of copying from Mainland China nor the option of copying from another OECD country are available, Hong Kong needs to develop its own policies. These policy measures need to bring economic diversification and high-end economic development, more opportunities and high-end jobs expected by the younger generation in HK through innovation and technology and the realization of HK's unique economic role in the context of Hong Kong as part of a rising China.

Address the systemic dimension of innovation

There needs to be a comprehensive review of the Hong Kong sub-national innovation system (i.e. HK-SIS) since no single HKSAR Government department or quasi-government unit can fully deliver the innovation eco-system needed by Hong Kong. The review will probably need to include a review of the current systemic dimension of innovation and institutions that are supposed to be delivering innovation service to the community. The systemic dimension includes linkages between industries and institutions that are funded by the Innovation & Technology Commission, R&D funded by the Research Grant Committee (RGC), the local linkages and international

roles now being performed by the Intellectual Property Department.

Innovators and entrepreneurs are not usually the type of people who have the capacity to examine the innovation eco-system that has direct implication on what they are doing. Such a review often affects the interests of the existing government and quasi-government units that are within the current system and this review and the prospect of change goes against the grain of the bureaucracy that are more than happy to stick to existing rules and process. Unless there is strong leadership at the political level, civil servants often resist change and ask if the proposed innovative activities and process are proven around the world, in Mainland China and in Hong Kong. In addition to the need for political leadership, there are also obstacles, e.g. skills shortages, competence gaps, the requirement for finance and appropriation of resources. In the experience of OECD countries (Oslo Manual 2005), linkages need to be built between "creation" and "diffusion"—R&D inputs and non-R&D inputs within the innovation process. There are also few incentives for the HKSAR Government to innovate. Therefore, the HKSAR Government can also inadvertently create obstacles that prevent the use of knowledge and skills that are available in the market.

While there is no lack of entrepreneurial and innovation skills in Hong Kong, the absence of clearly stated goals and strategy at the HKSAR Government level creates uncertainties. Small breakthroughs involving sometimes heroic efforts of small companies or individuals do not lead to long-term systemic and consistent application and these tend to result in isolated actions, which do not increase the total innovation capacity that is much needed in Hong Kong. This is the reality and probably the main reasons why Hong Kong has not been able to establish an economic transformation strategy and a meaningful capacity that is based on "Knowledge" and "Innovation and Technology".

Implementation in Hong Kong: the Five Steps

The implementation of a support structure to build up the economic development capacity to create a fully blown knowledge-based economy in Hong Kong contains five key steps: in this section these steps are described and arguments are made as to why Government has a key role to play.

When Hong Kong Chief Executive C.Y. Leung went to see President Xi Jin-ping in Beijing on 18 March, 2013, Xi said Leung's policy idea, of seeking change while maintain stability has been widely recognized by Hong Kong citizens but he also urged Leung and the HKSAR Government to fully implement the ideas.¹⁰ When Politburo Standing Committee member Zhang Dejiang met a Hong Kong business and professional delegation in Beijing on 27 April, 2013, he warned that Hong Kong may be losing its competitive edge and at risk of being "swept downstream if it does not forge ahead."¹¹ Consensus needs to be built within Hong Kong and the HKSAR Government also needs to acknowledge that Hong Kong could be losing its competitive edge¹² versus other mainland cities. While a clearly stated policy is required, the adjustments needed by Hong Kong are not radical ones as it is possible for Hong Kong

to make small adjustments and build an innovation eco-system based on the existing resources and institutions. However the task ahead will involve consensus building, political leadership and very strong implementation skills.

The Five Steps

Fortunately, Hong Kong's weakness is not in implementation. If the HKSAR Government was to make up its mind and forge ahead with building up the economic development capacity to support a knowledge-based economy in Hong Kong, the following are some of the specific steps needed to make things happen:

Step I: Develop and Utilize Appropriate Skills: Hong Kong under-performs in the skill development area amongst the developed countries. It ranks 37 in the world (Global Competitiveness Report 2012-2013, World Economic Forum)¹³ in terms of "Tertiary Education and Training". In the longer term, Hong Kong should obviously invest more in tertiary education and directly finance more higher education opportunities.¹⁴ In the shorter term, the HKSAR Government could partially fund and encourage universities in Hong Kong to provide post-graduate degree or diploma courses that are more directly related to the implementation of the knowledge-based economy, innovation and technology.¹⁵ A skill inventory audit, policy participation from the Education Bureau and coordination at the highest level of the HKSAR Government are needed before these skill development policy measures could be put into action. There is no shortage of knowhow and suitable course content is available from around the world as Hong Kong uses English as the primary medium of instruction.

Hong Kong just needs to start an audit to find out what skills are needed, where to find them and how to put to use those skills to achieve the desired economic development and job creation objectives.

Step II: Strengthening SME's Innovation Capacity through a SMBA and EEN-HK: As Keenan reported in 2012, Korea's "catch up" phases of economic development (1960s-late 2000s) have focused on the "Chaebols" and, until recently, largely neglected the SMEs. Until recently, Taiwan-not Korea-has been the shining Asian example of SME-centric economic development. The Small and Medium Business Agency (SMBA) of Korea now operates five major schemes to support SMEs.¹⁶ Korea also operates six offices of Enterprise Europe Network-Korea,¹⁷ with three offices in Seoul.

In the case of Hong Kong, there is no dedicated Hong Kong unit of EEN. Although Hong Kong says it supports "Free Market Economy" and "Positive Non-intervention", in reality, large local business has always had a dominant role in influencing government policies. Currently, SME support often follows the "colonial" tradition of offering this through quasi-government agencies or departments. Sometimes, these services are offered at market rate in competition with SME services suppliers.¹⁸ Support measures to SMEs in Hong Kong,

particularly the knowledge-intensive SME manufacturers and service suppliers who form part of the Meso-economic structure, consist of rules, regulations and processes through which government and quasi-government units in Hong Kong engage the public and the business community. These will need a comprehensive review. The traditional engagement process of adding fragmented measures in piecemeal and scattered manner without changing the political-administrative structure is unlikely to help Hong Kong to move forward to become a knowledge-based economy.

Step III: Re-align and Coordinate R&D Spending: Closely related to SME support is availability of financial capital. Even though Hong Kong ranks number two in the world in terms of "Venture Capital Availability",¹⁹ VC companies in Hong Kong are not doing well because the links between incubation and Angel Capital/Venture Capital financing are essentially missing. Both the government and the business sector spend very little on R&D and the funding support measures provided by the HKSAR Government are essentially inadequate. Hong Kong has very little experience in this area but could look into how the Israeli Government²⁰ fund and support innovation and technology startups through OCS (Office of Chief Scientist) and YOZMA ("initiatives" in Hebrew) — a government sponsored Venture Capital Scheme which has since been privatized because of its success.

In the case of Hong Kong, it might be too difficult to persuade the HKSAR Government to start an OCS that funds up to 60% of private sector R&D, but the HKSAR Government already funds R&D in universities through the RGC (Research Grant Committee) of the Education Bureau. The ITC (Innovation and Technology Commission) also provides some support to R&D in the private sector directly and provides some support to technology startups through the Cyberport and Hong Kong Science and Technology Park (HKSTP). Thus it should not be too difficult to persuade the HKSAR Government to provide a more systematic support and screening system modeled after proven technology transfer processes (e.g. from Aalto University of Finland and University of Waterloo of Canada) and link the improved Hong Kong process to the Hong Kong version of YOZMA—a US\$100 million venture capital funding that offers an option to private sector partners to buy back the government's share (maximum of 40% of total investment) within five years at cost, after charging a 5-7% interest.

Step IV: Internationalize: South Korea and Taiwan have been using and trying to attract native ethnic returnee while Israel has been using Jewish scientist from Russia and other parts of the diaspora in supporting their development. Singapore has a strong track record of importing international expertise, one example of which is the importing of University of Dundee (Scotland) know-how and personnel, including a Nobel Laureate, to start a Biotechnology Sector and there are also various schemes to attract foreign students to increase the local pool of

R&D talents. Even though Hong Kong is already a very international market place and has acquired many international contacts through the financial, trading and OEM manufacturing sectors, HKSAR Government support is still needed if Hong Kong is to participate fully in international forums and networking in the scientific and commercialization of R&D fields. The proposed Enterprise Europe Network-Hong Kong (EEN-HK) application is a good example of this type of international link. In this specific innovation and technology area, Korea is clearly ahead of Hong Kong as they operate six EEN-Korea offices throughout Korea (three in Seoul). Israel also operates EEN-Israel under three leading industrial consortia²¹ that focus on different aspects of cooperation with Europe.

Ironically, English is probably more widely spoken in Hong Kong (particularly amongst the youth) than in South Korea, Taiwan or Israel and this fundamental "competitive advantage" amongst us is probably underused because of absence of a coordinated economic transformation policy that make best use of two of Hong Kong's fundamental strength— Hong Kong's English speaking capacity and international outlook.

Step V: The South Korean experience and implications for Hong Kong: Significant institutional changes came with Korea's shift from "catch-up" mode to a "creative" (leadership) mode of development, including changes in the interaction and action amongst several Korean institutions. During the Asian Financial Crisis of 1997, one-quarter of Korea's Chaebols did not earn enough money to meet the interest payment on their loans. They were, therefore, a major target of governance and transparency reform. In many cases, institutions that had worked well in the "catch-up" phase were reconstituted or dismantled. Chaebols had to sell off unprofitable businesses to foreign firms. A similar situation did not happen as Hong Kong faced a severe economic downturn, and the Hong Kong financial sector survived well in both the 1998 Asian Financial Crisis and Global Financial Crisis of 2008.

Hong Kong should also learn from Korea and stop thinking of itself as a passive dependent of the developed economies. Hong Kong is already developed in every respect. It should not be beyond the imagination of everyone in Hong Kong— policy makers in the HKSAR Government, industrialist, bankers and the younger generation —that we could become one of the leading commercialization centres of the world, serving mainland China, Europe and other countries. The technical and policy solutions are already there. The political and consensus building situation is far from straightforward or easy: this is the political economy aspect—the rules and arrangement of how government and quasi-government institutions interact with the community. There are other experiences which Hong Kong may need to learn from around the world as we move forward. Hong Kong, however, is less entrenched in its innovation and technology support institutions than Korea was, and could face an easier task than the one faced by Korea today.

Next Steps: Making Things Happen

In this section we state the obvious: in order to promote, encourage and stimulate entry of the majority of Hong Kong companies into full participation in the KBE, it will take more than words. Actions need to follow and, with an opportunity of this scale and complexity, HKSAR Government involvement is absolutely indispensable. We have recommended the first tangible actions needed.

There have been deeply rooted tensions in the overall policy systems of Hong Kong for some time. We mentioned the problems and opportunities facing the Government in running Hong Kong under "One Country, Two Systems". We suggested how the "Free Market" versus "Economic Planning" argument could be resolved by borrowing South Korea's new SME centric economic development strategy which might work well in Hong Kong. We have also alluded to the absence of an innovation eco-system in Hong Kong and the misguided policy of requiring quasi-government agencies to compete with private sector suppliers. Mr. C.Y. Leung, the current Chief Executive of Hong Kong, has noticed²² the skewed income distribution, falling living standard and lack of upward mobile opportunities for young people. These social and economic problems will not go away and the resources needed to solve them can only come from new bursts of economic activities similar to the political and economic energy released by South Korea, Taiwan, Singapore and Israel when they perceive themselves to be in crisis situations.

The HKSAR Government should try to inspire hope and opportunities for the next generation. Telling young people to start their own business, "Go West", "Go North" without providing the tools and systematic support they need is the same as telling them to "Go Away". However, inspiring hope is only part of the story. There are competing rationales within the HKSAR Government, short-termism in thinking and many unresolved strategic issues regarding Hong Kong's political economy and economic development policy. Hong Kong must make its own policy choice—neither the Central Government in Beijing nor the protesting youth groups can tell us the right things to do. In Israel, they say: "... if you don't believe in miracles, you are not realistic." Hong Kong does not have all the ingredients needed to create a "Knowledge-based Economy" but we do have most of the ingredients many countries in Asia could only dream about. A miracle is not needed—some small adjustments will do the trick.

To make things happen, Hong Kong needs to:

1. Adopt a horizontal industry support policy that include SMEs and SME Start-ups: Once a strategy and a direction are found and articulated, the HKSAR Government needs to back up those strategies with a comprehensive policy framework—to add new resources and to ensure resources and initiatives that are already embedded in other policy domains (e.g. education, cultural policy, healthcare, inbound investment and trade) can be properly released. Strong publicity is also needed to gain support from the Legislative Council and from the community.

2. Coordinate policy practices: We must first assume that the HKSAR Government's agenda and vision would include developing a "Knowledge-based Economy". Without recognition of such a strategic vision, things will simply not happen. At the same time government departments and agencies, perhaps with the help of the "Efficiency Unit" under the Chief Secretary's Office, should try to coordinate their practices to achieve optimum results. Some believe that this is a "best practice", since innovation could be implemented directly by departments and agencies at the ground level. But since "Knowledge-based Economy" is still a new subject within the HKSAR Government, coordination may need to be initiated at as high as the "Policy Committee"²³ chaired by the Chief Secretary. Such an intervention could be a short-term one. The objective is to turn coordination of practices within the HKSAR Government into a coordinated structure and standard operating procedures.
3. Government to provide financial support: The "Knowledge-based Economy" and innovation and technology should make best use of existing initiatives across the Government, and include other important elements, such as the technology incubation systems used in universities and within industries. Stronger links between Hong Kong, Mainland and international institutions in Europe also need to be built. Industry associations and SMEs (particularly the SME-startups) deserve some financial support from Government. Whether Hong Kong should follow the Israeli example of starting YOZMA, a US\$100 million joint funding scheme with private venture capital, is an open question. The measures needed will include a substantial scheme of financial support that will require discussion at the political economy and community-wide level. Trajtenberg in 2000 provided a detailed overview of R&D Policy in Israel, while Fisher and Eilan in 2011 followed this up with a country report on Israel and Senor and Singer in 2009 provided focus on Israel as a "start up nation." The experience of other leading nations can be of benefit to Hong Kong.
4. Political leadership and policy integration: A comprehensive innovation policy spans boundaries of policy bureaux of the HKSAR Government, yet policy implementation throughout the Government should be coherent and mutually supportive. Hong Kong is likely to face a situation faced by many other governments where there is often a lack of understanding of innovation policy. This could undermine communication and co-ordination. There could also be different beliefs in the economic development, international relations and scientific domains. These different schools of thought and particularly the "Sector-based Support" now favored by the HKSAR Government versus "Horizontal Support" favored by OECD need to be reconciled. Knowledge and political skills are needed to create a common vision if Hong Kong stands any chance of moving forward into this new economic frontier.
5. Build intelligence systems—domestically, in mainland China and internationally: The creation, implementation and governance of innovation and technology

policies are knowledge-intensive. Policy production, policy evaluation and policy implementation need to be linked to policy-relevant knowledge. Even though Hong Kong has very little experience in this area, we are extremely fortunate that Hong Kong uses English as a business language and can build links with OECD, European Union and leading government, non-government organization and knowledge networks extremely quickly. While the task may seem daunting at the beginning, NGOs, trade organizations and Quasi-government units are ideally placed to take up different policy and knowledge domains in trying to assist the HKSAR Government build a comprehensive framework and structure. The Central Policy Unit, the Government's official think tank, will have a role. Again, the main difficulty now faced by the HKSAR Government is that it needs to be done in the absence of policy advice from an Innovation and Technology Bureau.

Conclusion

In conclusion this paper is a discussion about the political economy of Hong Kong's economic transformation. To make things happen, policy plans and implementation steps need to be included into the next Policy Address. Government must be prepared to lead politically, soliciting support from the business community, from the public and from the Legislative Council. The focus needs to be on implementation, accountability and governance—ensuring that the "Knowledge-based Economy" is based on sound experience from the more developed countries and ensuring that it is built well and built quickly. Only then can the promotion, encouragement and stimulation of entry of the majority of Hong Kong companies into full participation in the KBE be achieved, and in this transformation process, there is a key role for the HKSAR Government to play.

Notes

1. Xi Jin-ping urged C.Y. Leung to fully implement the policy idea of "...seeking change while maintaining stability" at a meeting in Beijing on 18 March 2013.
2. Rules, regulations and government structures—including project funding structures.
3. They include: Korea, Taiwan, Singapore, Israel, UK, Finland and The Nordic Countries of Europe.
4. "Line-to-take" is bureaucratic jargon. Essentially, it is a concise briefing circulated within the Administration that describes defensive positions taken up by the HKSAR Government. These "lines" include historical lines that form the memory and therefore the unsaid rules and regulations (i.e. Meso-economic Structure) of how Hong Kong is run today. They are often difficult to break as civil servants are, by their nature, conservative.
5. Chapter 3, Concept of national innovation system, in a background paper entitled "Enhancing the competitiveness of SMES: sub national innovation systems and technological capacity-building policies," Dr. Deok Soon Yim, Science and Technology Policy Institute (STEPI) of South Korea (January 2006).
6. Georgetown Journal of International Affairs, Walsh School of Foreign Service of Georgetown University, 27 March, 2013.
7. Tony Latter was a former Deputy Secretary for Monetary Affairs for Hong Kong (1982-1985) and Deputy Chief Executive of the Hong Kong Monetary Authority.

8. YOZMA is Israel's success story in venture capital investment strategy and in encouraging in technology start-ups in Israel. It was a scheme that replaced INBAL, a government-sponsored scheme that gave 80% guarantee to VC investments. Instead, YOZMA offered an option to buy the government's share (maximum 40% of the investment) within five years at cost (i.e. after charging a 5-7% interest).
9. The NXT flat speaker is an example of a technology that has origin in military research, developed in the UK from Ministry of Defence technology. After many iterations, the company now named HiWave is selling technology into the market place and has strategically placed an office in Hong Kong Science and Technology Park.
10. Xinhua News Agency, 18 March 2013
11. South China Morning Post, Page A1, 28 April 2013.
12. The front page story of SCMP (28 April 2013) quoted Zhang Dejiang: "Only when the economy continues to thrive will livelihoods improve. Everything else is empty talk." A similar warning was made by Deputy Director Zhou Bo of the Hong Kong and Macau Affairs Office. However, Professor Chan Ka-keung, Secretary for Financial Services, disagreed with such warnings, citing the financial market as an example of Hong Kong's success.
13. "Tertiary Education Enrollment Rate," Global Competitiveness Report 2012-2013, World Economic Forum: More than 80% of young Koreans today are participating in tertiary education. Korea world ranking: 1; United States:2; Finland:3; Taiwan:7; Singapore:19; Israel:28; Japan:36; Hong Kong:37; UK:40; China:79.
14. Hong Kong claims a 60% participation rate in post-secondary education. However, only 18% of those places are degree courses funded by the University Grant Committee. The rest are self-financed sub-degree courses.
15. Relevant courses include: Post Graduate Degree Courses for IP Attorney, Part-time Post Graduate Diploma Course in: Intellectual Capital Management, Commercialization and Technology Transfer Business Executives.
16. The SME support programmes include: Inno-Biz, KOSBIR, SMEs Technology Innovation Programme and Transfer Technology Development Project.
17. Enterprise Europe Network is a Government sponsored Pan-European Union technology transfer and business support network, providing all its services free of charge at the point of use.
18. A consultancy study titled "Consultancy study to review the role, management and operation of the Hong Kong Productivity Council (HKPC)" conducted in 2002 reveals that HKPC has an annual operation budget of approximately HK\$600 million but is only given a block grant of HK\$200 million per year. This funding policy has remained largely unchanged. The HKPC still competes for funding and business revenue with the private sector. This practice has, in fact, prevented many knowhow and practices of the knowledge-based economy from being introduced to Hong Kong. An exemption clause in the Hong Kong's Competition Laws to be enacted in Hong Kong also protects the HKPC from being prosecuted for anti-competitive behavior.
19. "Data Table 8.05, Venture Capital Availability" of the Global Competitiveness Report 2012-2013. Qatar ranks:1; Hong Kong:2; Israel:3; Singapore:4; Taiwan:9; USA:10; Finland:13; UK:16; China:22.
20. The Israeli Government funds R&D through military research and programmes under the Office of Chief Scientist (OCS) of the Ministry of Industry, Trade and Labor (MOIT). YOZMA (1993-1998) is the government sponsored programme started by Yigal Erlich, the chief scientist of the OCS that brought Israel from "nothing" to ranks number three in the world in terms of "Venture Capital Availability."
21. They are: MATIMOP of the OCS (international R&D focus), Manufacturing Association of Israel (MAI—international technology collaboration focus) and Israel Export and International Cooperation Institute (IEICI—focused on facilitating international commercial collaboration), <http://www.enterpriseisrael.org.il/about-us/enterprise-europe-network/>.
22. Mr. C.Y. Leung's speech at the Hong Kong Democratic Foundation on 24 September 2009.

23. The Policy Committee, comprising the Secretary for Justice and all Secretaries of Bureaux, is the main platform for policy co-ordination and initial clearance within the HKSAR Government. The Committee will carefully consider all policy proposals before they are submitted to the Chief Executive in Council for deliberation and decision.

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