



Seizing Opportunities, Hong Kong's Innovation and Technology Has a Bright Future

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In recent years, global innovation and technology activities have been booming, and the Mainland's high-tech industry develops rapidly. Hong Kong's government, the general public, and businesses are aware of the relatively slow growth of technology locally. Against the backdrop of construction of Guangdong-Hong Kong-Macau Greater Bay Area, coordination mechanism of Greater Bay Area cities and the Pan-Pearl River Delta Regional Co-operation, Hong Kong hopes to catch up by leveraging advanced experience on the Mainland and globally. This article reviews the development of innovation and technology in Hong Kong, analyzes the successful experience in Mainland China and abroad, and explores new opportunities for future development.

The history of innovation and technology development in Hong Kong

1. Development of innovation and technology in Hong Kong can be traced back to the 90s of last century. The first Chief Executive of Hong Kong Tung Chee Hwa pointed out in the 1997 Policy Address that adapting to new technologies and developing new industries will always be important for Hong Kong. Mr Tung aimed to make Hong Kong an innovation center and an international hub for the manufacture and trading of Chinese medicine. Then the Innovation and Technology Committee was established, chaired by Prof TIEN Changlin, and HK\$ 5 billion was injected to set up the Innovation and Technology Fund (ITF). Projects such as Science Park and Cyberport were built afterwards to improve the infrastructure of innovation and technology. In 2000, the Innovation and Technology Commission was established, mainly responsible for the formulation of policies and measures on innovative and technology. Later, five R&D Centers were set up. However, under the free economy philosophy of "small government, big market", social views on support for the development of innovation and technology diverged. Adding inadequate investment and poor implementation, the vision of developing innovation and technology in Hong Kong came to a standstill.

2. In recent years, the atmosphere of innovation and technology has improved. In November and December of 2015, the Innovation and Technology Bureau and the Academy of Sciences of Hong Kong were set up. The former is responsible for formulating comprehensive policies to guide the Innovation and Technology Commission. The latter aims at bringing together the scientific research power of Hong Kong's universities, concentrating on public education of science and technology, scientific research, science popularization, and cooperation with industrial and commercial institutions. In November last year, the ITF launched a HK\$500 million Technology Voucher Programme (TVP) on a pilot basis, subsidizing small and medium enterprises' (SMEs) use of technological services and solutions. In 2015, 3,885 enterprises and 7,334 enterprises engaged in R&D and innovation activities in Hong Kong, while total R&D expenditure and innovation expenditure of the business sector were US\$1 billion and US\$2.2 billion, respectively, increasing

7% year-on-year and 3% year-on-year. The number of start-up enterprises in Hong Kong increased 46% year-on-year to 1,588 in 2015 and reached 1,926 with annual increase of 24% last year. Local companies share as a percentage of total start-up enterprises rose from 50% to 62%.

3. Hong Kong's global ranking in innovation and technology has plenty of room to improve. Although activities of innovation and technology in Hong Kong continued to grow, the global comprehensive ranking of Hong Kong remains subdued. The Global Innovation Index (GII) showed that Hong Kong was ranked 11th, 14th and 16th respectively from 2015 to 2017 in comprehensive innovation ability. Global Entrepreneurship and Development Index (GEDI) indicated that Hong Kong's ranking continued to decline since 2012, and has yet to rebound to the 30th position in 2012. In addition, results of local surveys on Hong Kong's innovation and technology in August showed that all respondents agreed that Singapore, Seoul, Shenzhen, and Taipei outperform Hong Kong in the development of innovation and technology, and nearly 60% of respondents believed that current development of innovation and technology in Hong Kong fails to meet the general public's expectation.

Major reasons for the relatively slow development of Hong Kong's innovation and technology

It should be objective to analyze the current situation of Hong Kong's innovation and technology from the angles of history and reality. The development of related industries since the 90s of last century was rather orderly and acceptable but still lagged behind advanced countries and the Mainland which developed rapidly. Identifying the main factors that restricted the development of Hong Kong's innovation and technology can help Hong Kong grasp future opportunities.

1. International experience could provide reference. Take Finland as an example. Nokia's exit from the mobile phone business has expedited the development of the innovation industry. On the government level, the Finnish Funding Agency of Technology and Innovation (Tekes) provided innovative enterprises with licenses, tax, and office rental concessions and established test fields of big data. Meanwhile, a Bridge Program guaranteed by the government provided entrepreneurial support and loans for related activities, so as to build an industrial chain for collaboration between large, medium and small enterprises. In Israel, the government invested US\$100 million to set up Yozma Venture Capital in 1992. Start-up enterprises paid only 15% of their budgeted funds, with the remaining 85% being borne by Israel's Office of the Chief Scientist. At the same time, Israel has also established the non-profit organization MATIMOP to introduce domestic and foreign investment opportunities. In addition, Israelis enter universities after having finished military service following their graduation from high school. 500 science and technology training personnel are nurtured each year, providing a talent pool for innovation and technology. The government's strong support and active participation of enterprises as well as the public are the key to success for most of the innovative cities in the world.

2. The Mainland's innovation momentum provides an impetus for Hong Kong. Driven by the strategy of rejuvenating the nation through science and the activities of "Mass entrepreneurship and innovation" in recent years, development of innovation and technology was rapid in the Mainland. China Industry Development Report showed that the gap between Chinese internet industries and international advanced level continued to narrow last year, with annual growth of electronics manufacturing industry and the software and IT service industries recording 8.4% and 14.9% respectively. In terms of unicorn companies (startup companies valued at US\$1 billion or

more), statistics showed that as of the end of July this year, total valuation of such enterprises in the Mainland reached US\$36 billion, higher than the US\$22 billion of the United States, although the number of these enterprises in the Mainland was smaller. Shenzhen, a city adjacent to Hong Kong, is a microcosm of China's development of innovation and technology. Thanks to policy support, special geographical location, law system, economic strength, open social culture, strong investment in R&D and abundant talents, value added by high-tech industries in Shenzhen increased 12.2% year-on-year to 656.002 billion yuan last year. Innovation and technology has become an important driving force in promoting economic development.

3. Multiple factors resulted in relatively slow development of innovation and technology in Hong Kong. The first is insufficient resources. In recent years, although local R&D expenses and personnel have continued to grow, the proportion of R&D expenses to GDP remained around 0.73%, significantly lower than the 2.02%, 4.15% and 3.12% of Singapore, South Korea and Taiwan and also lower than the 2.1% of the Mainland. The second is the imbalance of industry ecology. The initial and final segments of science and technology innovation (primary and secondary school education and scientific research commercialization) remain severely insufficient in Hong Kong. Scientific research at universities often benefited others while few technological achievements have been applied locally to boost productivity. The third is an inactive investment climate. Risk aversion of Hong Kong's investors have driven family funds to real estate and financial markets, resulting in private institutions' low investment in innovation and technology. On the R&D level, the public sector accounted for more than 80% of spending, quite different from the ratio of public to private sector of 30:70 in the United States. In addition, several factors including insufficient market demand due to limited population, a lack of construction sites due to land scarcity and expensive land prices, and high cost of business start-ups constrained the development of innovation and technology. Therefore, public support, enterprise financing, industry ecology and cost control are the main challenges for development of innovation and technology in the future.

Major opportunities of Hong Kong's development of innovation and technology

With China's economy entering a New Era and innovation development in the Mainland being supported by the national strategies of "rejuvenating China through science and education", Hong Kong can make full use of China's favorable policies, advantages of an international financial center and regional cooperation opportunities, to push its development of innovation and technology.

First is that a series of new ideas and initiatives by the Hong Kong government are conducive to promoting the development of innovation and technology. The latest Policy Address makes innovation and technology a priority, aiming to promote the development of innovation and technology on all fronts from eight aspects, including increasing resources for R&D, pooling together technology talent, providing investment funding, providing technological research infrastructure, reviewing existing legislation and regulations, opening up government data, arranging government procurement and promoting popular science education etc. Hong Kong government proposed to introduce a 300% tax deduction for the first HK\$2 million eligible R&D expenditure and 200% for the rest, to encourage R&D investment by enterprises and to raise the percentage of R&D to GDP from 0.73% to 1.5% in the next five years. The government also decided to launch a HK\$500 million "Technology Talent Scheme", to set up a "Steering Committee on Innovation and Technology" as well as a "Policy Innovation and Co-ordination Unit", and to develop a smart city etc. These measures will provide real support for the development of innovation and technology in Hong Kong

and will create a more convenient entrepreneurial environment for start-up companies.

Second is that Hong Kong can share the favorable policies of the Mainland's New Era. The report of the 19th National Congress of the Communist Party of China (CPC) mentioned the "Internet" for 8 times. In order to build a modernized economic system, the report suggested "to promote further integration of the internet, big data and artificial intelligence with the real economy", and to build an innovative country with the goal of a "powerful nation of the Internet", which fully displays the importance of innovation and technology in China's future economic development. Cloud computing, big data and artificial intelligence will likely become three pillars. Hong Kong is the tenth largest source of the Mainland's technology imports in terms of contract amount in 2015 and was ranked the fourth after Singapore, the United States, and Germany based on the number of contracts. At present, Hong Kong has 16 "Partner State Key Laboratories" and 6 "Branches of Chinese National Engineering Research Centers", covering various technology areas. With the Mainland's economy entering a New Era, Hong Kong is bound to further integrate into the nation's science and technology progress. Hong Kong is expected to seize the opportunities afforded by various policies to participate in the construction of a moderately well-off society and a strong and modern country.

Third is that the construction of Guangdong-Hong Kong-Macau Greater Bay Area, coordination mechanism of Greater Bay Area cities and the Pan-Pearl River Delta Regional Co-operation could provide a win-win platform for Hong Kong's development of innovation and technology. Since the establishment of "Hong Kong-Guangdong High-tech Cooperation Joint Conference" in 2003 and its inclusion of Shenzhen in 2005, the collaborative development between Hong Kong and Guangdong has become increasingly mature. Qian Hai Shenzhen-Hong Kong Youth Innovation and Entrepreneur Hub was launched in 2013, and in July 2016 the Mainland and Hong Kong jointly built the "HONG KONG X-Tech Startup Platform (HKX)", aiming at leveraging the advantages in system, scientific research, funding and location to build "made in Hong Kong" and "created in Hong Kong" products. In January this year, Hong Kong and Shenzhen signed a Memorandum of agreeing to jointly develop the Lok Ma Chau Loop into "Hong Kong-Shenzhen Innovation and Technology Park". In the process of Bay Area construction, by attracting national-level R&D institutions, Hong Kong and Shenzhen could promote an integrated allocation of technological as well as innovative resources (such as R&D, experiments, and information), and encourage close cooperation of servicing innovation enterprises in different stages, to build an international innovation and technology center for the Bay Area.

Fourth is that the functions of Hong Kong as an international financial center and its scientific strength will lay a solid foundation for its development of innovation and technology. As a renowned international financial center and under "One Country, Two Systems", Hong Kong possesses comprehensive advantages in an international trade network, transparent and open markets, rule of law, low tax rates, a fair competition environment, intellectual property protection, professional services and judicial system, so it can attract overseas top research institutions. Meanwhile, Hong Kong's scientific research institutions have world-leading advanced technologies in pharmaceuticals, food processing and food quality assurance. Also, as a major information and telecommunications hub in the region, Hong Kong is well equipped in developing healthcare, smart aging, and a smart city. These could provide support for the development of innovation and technology activities.

In conclusion, with the trend of global innovation and technology development and the Mainland's entering a New Era, Hong Kong will fully grasp the opportunity in the future to realize the goal of becoming an international center for innovation and technology.