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Author: Zhao Chenlin
Email: charliezhao@bochk.com
Tel: +852 282 66295

Contact: Ms. Chan
Email: ccchan@bochk.com
Tel : +852 282 66208



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Learning to Innovate: Promoting Technological Innovation in the Northern Metropolis Through Bringing International Experiences of Effective Governance

Economist, Zhao Chenlin

The Northern Metropolis Development Strategy (the Strategy), promulgated by the Hong Kong SAR government at the end of 2021, displays an unprecedented blueprint for the urban development of Hong Kong by forging opportunities for improving residents' livelihood and supporting the city to develop into an international innovation and technology (I&T) hub. Besides, the direction of development and positioning of Hong Kong stated in the Strategy are increasingly vibrant against the backdrop of the documents promulgated by the Central Government, namely, the National 14th Five-Year Plan, the Outline Development Plan of the Guangdong – Hong Kong – Macau Greater Bay Area, and the Qianhai Plan. The Northern Metropolis certainly will be a colossal urban space for Hong Kong to further integrate into the overall national development and join hands in taking forward the development of the Greater Bay Area (GBA). One of the most significant opportunities the Strategy brings to Hong Kong is to build up an I&T ecosystem for the transformation of economic structure, which is vital to maintaining the city's status as one of the most vibrant and competitive opportunity hubs in Asia. The traditional four key industries in Hong Kong, including financial services, tourism, trading and logistics, and professional and producer services, have been the driving force of Hong Kong's economic growth, providing impetus to the growth of other sectors and creating employment. The Strategy also details the policy supports for the I&T sector and high-end manufacturing industry, which will be a catalyst for greater growth. To achieve this vision, the development plan of the Northern Metropolis will transform the northern part of Hong Kong into a 300-square-kilometer I&T economic engine and a metropolitan area for people to live in, work, and travel. The Northern Metropolis also aims to become a high-tech development zone in GBA with the capacities of resource allocation, technological innovation, and growth facilitation, and lead the formation of inter-industrial linkage, one-hour living circle, and technological cooperation between Hong Kong and its neighboring cities in GBA.

In general, the Northern Metropolis will be a transport infrastructure-led development with railways as its backbone, involving projects such as the Hong Kong-Shenzhen Western Railway linking up Hung Shui Kiu and Qianhai of Shenzhen, extension of the Northern Link, and the East Rail Line. An automated people mover system from Tsim Bei Tsui to Pak Nai will also be explored. On

top of that, pushing out industrial policies to support I&T development has been prioritized on the government's policy agenda. It is noticeable that policy innovation and diffusion could be the determining factor in whether the I&T industry can achieve maximum growth and sustainability in Hong Kong. Looking back, the Hong Kong government has always followed the principle of "small government, big market" by limiting its participation and intervention in economic activities. The government is considered to lack successful experience in leading the development of I&T industry when compared with that of the Mainland and Singapore. Therefore, this analysis elaborates on the trends and successful cases of the I&T industry development worldwide from the perspective of pragmatism, and the findings may serve for Hong Kong's future policy formulation and implementation for the I&T industry.

1. Global Landscape in Innovation and Technology Development

According to the latest ranking of the innovation performance of 132 countries and economies by the World Intellectual Property Organization, the global I&T industry increasingly presents a "winner takes all" pattern as the Covid-19 pandemic promotes digital transformation and technological development in advanced economies. Therefore, the competition faced by Hong Kong's I&T industry will become increasingly fierce in the future.

Trend 1: Small advanced economies have stronger innovation capacity

On the one hand, compared with China, the US, the UK, Germany, Japan, and other major economies, which have sufficient financial and human capital, small-developed economies such as Singapore, Israel, and Switzerland have slightly lower resource endowments and relatively small market scales. But the latter countries are very good at using the characteristics of the innovation economy to compete in individual segments. The common feature of such small-developed economies is that they have complete legal and intellectual property protection systems and perfect protection for technology research, implementation, business transfer, and other processes. Therefore, they can attract multinational companies and technical teams to settle and operate. It enables the enterprise's scientific research investment to transform into products and earn considerable profits quickly.

On the other hand, innovation-led small-developed economies also attach great importance to building a technological innovation ecosystem that keeps pace with the times. Taking Singapore as an example, as an innovation hub in Southeast Asia, the Singapore government has launched a variety of industrial guidance policies, such as "Smart Nation 2025", "Digital Government Blueprint", "SME Go Digital", and "Startup 5G", etc.

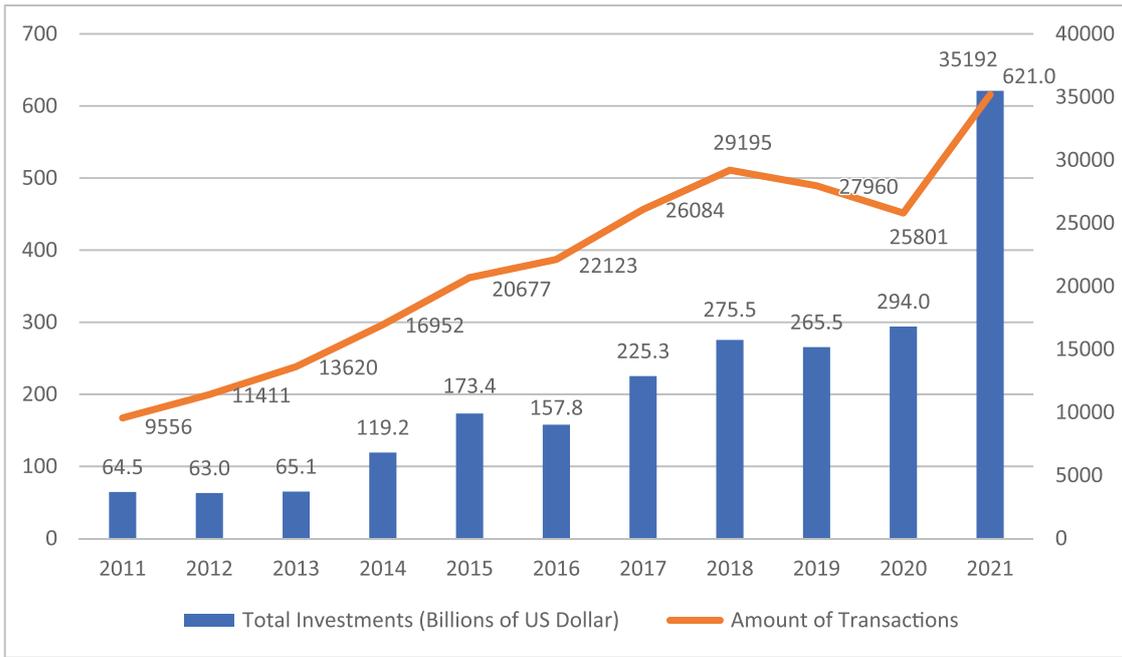
Multinational companies such as GlaxoSmithKline, Cisco, and Google have successfully been attracted to settle. The government also continuously improves the practicality of new technologies by providing sandbox labs that combine with the market covered by the companies, continuously improving the practicability and marketization level of new technologies.

Trend 2: Fundraising capacity has become a new measurement for the I&T industry

Apart from the commonly used measurement such as technology investment and the number of papers published, the number of innovative technology companies and their ability to raise funds have also become important indicators for evaluating the innovation capacity of an economy. The development of science and technology and changes in the social environment enable innovative companies to find opportunities to enter the market. Innovative technologies such as semiconductor chips, biomedicine, artificial intelligence, cloud services, and other fields are rapidly emerging and attracting investment. The number of venture capital investments has hit a new high in the past ten years. In recent years, the monetary easing implemented by developed economies in response to the epidemic has also pushed innovative companies' valuation and fundraising scale to record highs.

According to CB Insights (Table 1), the number of global unicorn companies has reached 959 in 2021, a surge of 69% compared with 517 in 2020. By the end of 2021, global venture capital investment reached \$621 billion, more than double the \$294 billion in 2020, with 44 new unicorns valued at more than \$10 billion. The regions with the largest transaction volume are North America, Asia, and Europe, of which the United States accounts for more than half of the world with US\$311 billion. In addition to venture capital, based on transformation needs, many large enterprises have also used Corporate Venture Capital to implement innovation investments and rely on new technologies and R&D talents to strengthen their ability to respond to market changes.

Table1: Capital Investment and Amount of Transactions in the Global I&T industry (2011-2021)



Source of Data: CB Insights, Hong Kong Financial Research Institute of Bank of China

2. Transformation Cases of Innovative Global Cities

2.1 How New York Became a Tech Town

Many people first think of the label of a global business and financial center when it comes to New York. However, New York has achieved explosive growth in technological innovation in recent years. Its technology industry center, “Silicon Alley” in Manhattan, is home to many high-tech enterprise clusters. Now it has become the main engine of New York’s economic growth. It is also known as another successor next to Silicon Valley, with the fastest-growing information technology center and the core area of global technology research and development. According to Forrester Research, a market research organization, the New York area has more than 330,000 technology practitioners, making it the largest technology talent pool in the United States. At the same time, nearly 100 academic institutions in the region can send more than 7,500 university graduates studying innovation and technology-related majors to the market every year. Their comprehensive talent training capabilities have greatly surpassed those of Silicon Valley and London.

In addition to its outstanding talent training capabilities, creating a good I&T environment to attract global talents and enterprises is also one of the critical factors for New York to achieve industrial transformation successfully. The New York City government attaches great importance to the construction, maintenance, and renewal of the city’s infrastructure all year round to create an ideal working and living environment for citizens. The main measures are as follows: First, improving the speed of data transmission and network construction. In 2016, the New York government invested and launched the urban Wi-Fi infrastructure project to provide high-speed, stable, and comprehensive free public Wi-Fi networks for millions of citizens and visitors in the city. Second, to facilitate access to public services for citizens and businesses. In 2003, the New York City government consolidated more than 40 government and public sector hotlines to create 311, a comprehensive non-emergency public service hotline that provides services in more than 180 languages. Citizens and enterprises can consult public services and reflect various demands at one stop. Third, New York City launched the largest “affordable housing” program in the history of the United States. The plan requires developers to rent 20%-30% of newly built apartments to low- and middle-income groups such as young entrepreneurs and tech workers at low prices. Implementing the “Affordable Housing” program effectively improves

the phenomenon of “young people cannot afford housing” to some extent, attracting and retaining more young talents for New York.

Starting from the needs of talents and serving talents to live and work in contentment is an essential feature of New York urban planning. For example, “One New York: The Plan for a Strong and Just City”, a comprehensive development plan introduced by the New York City Urban Planning Commission in 2015, is a concrete embodiment of the people-oriented orientation in the city development and public services of New York. The plan pays attention to the high degree of unity of urban innovation ability and talent welfare. It emphasizes that the improvement of New York’s overall innovation output is closely related to the cultivation and improvement of talents and their families’ education level, technology acquisition level, wealth level, ability level, and concept level. Therefore, while focusing on creating high-tech employment opportunities, the New York government also makes efforts in policy areas such as education, medical care, housing, and social services to develop an all-around social environment that is livable and suitable for work, innovation, and entrepreneurship.

2.2 A Brief History of I&T Development in Hsinchu, Taiwan

The Hsinchu Science Park, located in Hsinchu City, Taiwan Province of China, was established in 1980 and currently has six satellite parks, with a total development area of 1,375 hectares. According to the Hsinchu Science Park Administration, the park has about 600 approved commercial establishments and nearly 170,000 employees in 2021. The primary industries include semiconductors, computers, communications, optoelectronics, precision machinery, and biotechnology. In 2021, the total annual turnover of enterprises in Hsinchu Science Park is NT\$1.5 trillion (equivalent to approximately HK\$400 billion), reaching a record high.

Since its establishment more than 40 years ago, Hsinchu Science Park has driven Taiwan’s social, technological, and economic development. The industrial revolution in Hsinchu Park is also a microcosm of the local government’s gradual promotion of industrial policies. The industrial development of Hsinchu Science Park is highly related to the division of labor in the international market and can be roughly divided into the following three stages: In the 1980s, the park was mainly engaged in the processing and manufacturing of personal computers. The primary revenue came from exporting mid-and downstream products in the personal computer industry chain. In 1993, the total turnover reached about HK\$26 billion. The park entered the semiconductor foundry stage in the 1990s, and the total turnover in 1998 increased to HK\$170 billion. After entering the 21st century, the park began to enter the innovation stage. In 2004, the turnover exceeded HK\$260 billion with an increase of 10 times in 10 years. In terms of the number of patent applications, the Taiwan Semiconductor Manufacturing Company (TSMC) alone has 1,780 patents approved in 2021, showing the continuous innovation power of high-tech manufacturers in the park. Today, IC and optoelectronics industries have developed into the most representative sectors in Hsinchu Science Park. They have successfully led to establishing the global reputation of Taiwan’s high-tech industries.

To ensure the efficient operation of the park and the implementation of the policy benefiting enterprises, the local government established Hsinchu Science Park Administration to build various infrastructures and plan various service measures, including maintenance and renewal of infrastructure, public service single-window one-stop processing, innovative R&D tax and cash incentives, the establishment of industry-university-research cooperation mechanisms, and building high-quality human resources and culture in the park.

Among them, the park land policy is particularly commendable. To meet the needs of enterprises to expand production and long-term development in the future and take into account the financial pressure on enterprises during factory construction and trial operation, the land in the park implements the policy of renting only. It means enterprises can rent without paying huge land purchase costs at once. This move has supported many companies to further expand their investment in equipment and R&D, striving for business opportunities with a larger production scale.

2.3 The Upgrading Pathway of the I&T Industry in Shenzhen

Recently, it was the 42nd anniversary of the establishment of the Shenzhen Special Economic Zone. In just

40 years, Shenzhen has risen from a rural border in the Pearl River Delta and transformed into a major technology manufacturing center in China. According to statistics, there were more than 200,000 technology enterprises in the city in 2019, of which the total number of state-level high-tech enterprises exceeded 17,000, ranking only next to Beijing. The technology giants that have set up headquarters in Shenzhen have covered many sub-sectors, including Tencent, Huawei, DJI, BGI, and electric vehicle manufacturer BYD. At the same time, many home foundry industries based in Huaqiangbei Electronics District have driven the rapid development of the manufacturing industry. Shenzhen has now become the most dazzling star in the reform and opening up, a leading innovative city in the country. It is known as “China’s Silicon Valley” and “Innovation City”.

In the early 1980s, Shenzhen did not have the conditions for developing high-tech industries and was only able to adsorb advanced technology from the so-called “three types of foreign-funded enterprises” and export processing enterprises. In 1984, Shenzhen promulgated the “Temporary Measures for the Appraisal of the Introduction of Advanced Technologies in Shenzhen Special Economic Zone”, officially promoting the introduction of high-tech industries through the policy. In July 1985, the Shenzhen government further co-organized the first national-level “Shenzhen Science and Technology Industrial Park” with the Chinese Academy of Sciences and Guangdong International Trust and Investment Corporation. In 1987, the Shenzhen government issued the country’s first “Interim Regulations on Encouraging Technologists to Establish Private Technological Enterprises”, allowing and encouraging a group of technological R&D talents to invest in enterprises with technical patents, management measures, and other elements. With this policy support, Ren Zhengfei founded today’s world-class company Huawei.

Since 1999, Shenzhen has regularly held high-tech achievement fairs to help scientific research achievements make breakthroughs in information barriers between investment funds and technology enterprises, promoting many high-tech products to the market. Since the 21st century, Shenzhen’s high-tech enterprises have begun to develop rapidly. With the continuous increase in the number and scale of high-tech enterprises, companies with output values exceeding 100 billion yuan appeared for the first time in 2005. The development of Shenzhen’s high-tech industry has surpassed the stage of relying on “preferential policies”. It has turned into a sustainable development model that relies on “innovation”, realizing the historic leap from “Processing in Shenzhen” and “Made in Shenzhen” to “Creating in Shenzhen”.

3. Conclusion

After the handover in 1997, Hong Kong faced the outbreak of the Asian financial crisis and the industry “hollowing out” caused by the “north shift” of the manufacturing industry. Hong Kong SAR government promoted the “third industrial transformation”, striving to develop innovation and technology-based, high-value-added innovative technology industry, and has achieved certain results. Global pioneers’ I&T development experiences and general laws can provide reference and inspiration for Hong Kong to develop its I&T industry in at least the following two aspects. First, to boldly implement the experiences, some good industrial and public policies can be directly learned and applied, helping Hong Kong quickly seize the fleeting market opportunities. Second, when faced with the same or similar problems, many global experiences can be used as a frame of reference to help think about the solutions to major issues in Hong Kong, such as the relationship between the government and the market, the training and introduction of scientific and technological talents, the guide for enterprises to become the main body of innovation, construction and development of industry-university-research platforms, etc. These experiences and practices are believed to contribute to developing the I&T industry in the Northern Metropolis and drive Hong Kong to accelerate its transformation into an innovative economy.

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About the Author:

Dr. Zhao Chenlin received a PhD in public policy from City University of Hong Kong. His research interests include innovation policy, government performance management, public finance, and regional collaborative governance. Dr. Zhao was the postdoc fellow in City University of Hong Kong and served as a campaign strategist and policy advisor in the mayoral re-election campaign of Cupertino, California.

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主要經濟指標 (Key Economic Indicators)

	2020	2021	2022/Q1	2022/Q2
一. 本地生產總值 GDP				
總量 (億元) GDP(\$100 Million)	26,757	28,454	6,732	6,682
升幅 (%) Change(%)	-6.5	6.3	-3.9	-1.3
二. 對外貿易 External Trade			2022/07	2022/01-07
外貿總值 (億元) Total trade(\$100 Million)				
總出口 Total exports	39,275	49,607	3,796	26,802
進口 Total imports	42,698	53,078	4,072	29,147
貿易差額 Trade balance	-3,422	-3,471	-276	-2,346
年增長率 (%) YOY Growth(%)				
總出口 Total exports	-1.5	26.3	-8.9	-1.0
進口 Imports	-3.3	24.3	-9.9	0.2
三. 消費物價 Consumer Price				
綜合消費物價升幅 (%) Change in Composite CPI(%)	0.3	1.6	1.9	1.6
四. 樓宇買賣 Sale & Purchase of Building Units			2022/08	2022/01-08
合約宗數 (宗) No. of agreements	73,322	96,133	5,238	43,063
年升幅 (%) Change(%)	-2.0	31.1	-33.5	-36.8
五. 勞動就業 Employment			2022/04-2022/06	2022/05-2022/07
失業人數 (萬人) Unemployed(ten thousands)	259.1	250.9	17.9	16.8
失業率 (%) Unemployment rate(%)	5.5	5.5	4.7	4.3
就業不足率 (%) Underemployment rate(%)	3.1	2.7	3.0	2.2
六. 零售市場 Retail Market			2022/07	2022/01-07
零售額升幅 (%) Change in value of total sales(%)	-24.3	8.1	4.1	-1.7
零售量升幅 (%) Change in volume of total sales(%)	-25.5	6.5	1.0	-4.7
七. 訪港遊客 Visitors				
總人數 (萬人次) arrivals (ten thousands)	356.9	9.1	4.8	12.4
年升幅 (%) Change(%)	-93.6	-97.4	454.4	192.5
八. 金融市場 Financial Market			2022/06	2022/07
港幣匯價 (US\$100=HK\$)				
H.K. Dollar Exchange Rate (US\$100 = HK\$)	775.2	779.8	784.6	785.1
貨幣供應量升幅 (%) change in Money Supply(%)				
M1	30.1	8.0	-14.2	-7.4
M2	5.8	4.3	0.4	2.4
M3	5.8	4.3	0.4	2.3
存款升幅 (%) Change in deposits(%)				
總存款 Total deposits	5.4	4.6	0.4	2.5
港元存款 In HK\$	6.2	1.4	-3.4	0.7
外幣存款 In foreign currency	4.6	7.9	4.6	4.3
放款升幅 (%) in loans & advances(%)				
總放款 Total loans & advances	1.2	3.8	-2.3	-0.1
當地放款 use in HK	1.7	4.7	-2.4	1.1
海外放款 use outside HK	0.1	1.7	-2.1	-2.9
貿易有關放款 Trade financing	-6.2	14.2	-3.5	-8.9
最優惠貸款利率 (%) Best lending rate (%)	5.0000	5.0000	5.0000	5.0000
恆生指數 Hang Seng index	27,231	23,398	21,860	20,157