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Development and cooperation of the International Innovation and Technology Center in the Greater Bay Area

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"Building an International Innovation and Technology Center" is an important goal of the construction of Guangdong, Hong Kong and Macau Greater Bay Area (GBA). The Vice Premier of the State Council Han Zheng's speech at the first plenary meeting of the leading group for the development of the Greater Bay Area proposed that "We want to build the Guangzhou-Shenzhen-Hong Kong-Macau Technology Innovation Corridor and build the GBA International Innovation and technology Center." Today, developed economies with international competitiveness are supported by strong high-tech industries and technological innovation capabilities. From the perspectives of positioning, conditions and international experience, innovation and technology are undoubtedly the first driving force to lead the construction of the GBA, and the key to the development level and international competitiveness of the GBA. They are also the most important area for cooperation between Guangdong, Hong Kong and Macao in the construction of the GBA.

The development of innovation and technology in the GBA is in the ascendant

After years of industrial transformation and investment, Guangdong has become the leading technology industry in the country. In 2017, the province's R&D expenditure exceeded 230 billion yuan, accounting for 2.65% of GDP; the total number of patents granted was 332,600, the total number of high-tech enterprises increased to 33,000, and the output value of high-tech products was 6.7 trillion yuan. They all rank first in the country. Guangdong's high-tech industry covers a new generation of 5G communication technology, biomedicine, new energy, new materials and environmental protection industries. A number of internationally renowned companies with strong innovation and manufacturing capabilities have emerged. Guangdong's innovation and technology base, whether it is research and development or manufacturing, is mainly concentrated in the GBA.

Hong Kong has also begun to exert its strength in promoting the development of innovation and technology. In her 2017 Policy Address, the Chief Executive, Mrs Lam, proposed to develop Hong Kong into an international innovation and technology hub. In the following two years, the HKSAR Government has allocated a total of HK$78 billion to focus on the development of biotechnology, artificial intelligence, smart city, financial technology, and the construction of science parks. In recent years, Hong Kong has promoted the development of innovative and technology in a multi-pronged manner. The measures include:

(i) Encouraging investment in R&D. The Government provides additional tax deduction for expenditure incurred by enterprises on R&D (The first $2 million eligible R&D expenditure will enjoy a 300% tax deduction and 200% for the remainder) ;

(ii) Attracting talent. The Government has set up fellowship schemes to attract, train and retain talent, and the Greater Bay Area academician alliance to be set up in Hong Kong will certainly add to the might of our talent pool;

(iii) Creating an innovation platform and support innovation and technology enterprises. Funding $10 billion at the Hong Kong Science Park, with focusing on healthcare technologies, artificial intelligence and robotics technologies. Under the I&T Venture Fund, the Innovation &Technology Commission to invest, on a matching basis, in local technology start-ups operating in the Science Park;

(iv) Accelerating the construction of science and technology parks. The infrastructure works of the Hong Kong-Shenzhen I&T Park at the Lok Ma Chau Loop has commenced in June last year, planning to provide the

first batch of land parcels for superstructure development not later than 2021. The Science Park expansion project will be completed ahead of schedule in 2019, the InnoCell residential building for talent, as well as the Data Technology Hub and the Advanced Manufacturing Centre at Tseung Kwan O Industrial Estate will be completed progressively starting from 2020 as scheduled;

(v) Reviewing regulations and creating an environment. The PICO is now reviewing existing legislation and regulations, so as to remove outdated provisions that impede the development of I&T;

(vi) Opening up government data base. The Government firmed up the policy and implementation measures on opening up government data to provide the ingredients needed for technology research, and to promote smart city development;

(vii) Adjusting the procurement policy. The government will introduce a pro-innovation government procurement policy in April 2020. By raising the technical weighting in tender assessment, tenders with innovative suggestions will stand a better chance of winning government contracts;

(viii) Popular science education , promoting Science, Technology, Engineering and Mathematics (STEM) education in primary and secondary schools.

In recent years, the entrepreneurial enthusiasm of the younger generation in Hong Kong is heating up, and the number and willingness of international technology companies to invest in Hong Kong is increasing, indicating that the government's proactive policies are playing a role in the construction of the Hong Kong Innovation and Technology hub.

The conditions in the GBA are unique, and strengthening cooperation is the key to the development of I&T

The development of innovation and technology involves basic research, technology development and technology application. It requires multi-channel funds, institutional mechanisms to encourage innovation and entrepreneurship, and the support of a large number of technology and financial talents. Looking at these factors, the development of GBA International Innovation and Technology Center has many favorable conditions, as well as shortcomings. Factors contributing to GBA's development of innovation and technological include: Positive government policies; the allocation of factors such as labor, capital, land, technology, and management is continuously optimized; innovation culture and entrepreneurship are constantly improving; national system and free economy, collective strength and individual creativity are inclusive; inflow of scientific research and innovative talents; The Bay Area Governments have increased capital investment and gradually promoted the investment and participation of venture capital; The Bay Area has a huge domestic demand market, which is conducive to achieve the scale efficiency of new technologies in the promotion and application.

After years of investment, Guangdong's basic research capabilities and corporate R&D levels have significantly improved, and innovation and entrepreneurship culture, entrepreneurship, venture capital, and technology industry clusters and scale have grown. The breadth and depth of innovation and technological strength has reached the level of innovative countries or regions.

As far as Hong Kong is concerned, with the support of the state, the environment for innovation and entrepreneurship is improving rapidly. In May 2018, in a reply letter to 24 Hong Kong-based academicians of the Chinese Academy of Sciences and Engineering President Xi Jinping recognises that Hong Kong, with its solid foundation in science and technology and a pool of high quality technology talent, is an important force in implementing the nation's innovation-driven development strategy and building an innovative country. President Xi emphasizes that Hong Kong and the Mainland should strengthen scientific and technology cooperation, and renders his support for the development of Hong Kong into an international I&T hub.

In the past year, the Arrangement on Enhancing Innovation and Technology Co-operation between the Mainland and Hong Kong was signed between the Ministry of Science and Technology(MOST) and the Hong Kong Innovation and Technology Bureau, providing an overarching framework for mutual I&T collaboration. The MOST and the Ministry of Finance launched a new initiative, allowing universities and research institutions

in Hong Kong to bid for science and technology funding of the Central Government on the basis of merit and competition, and the funding granted can be used in Hong Kong. This has realised the cross-boundary remittance of science and technology funding. Hong Kong's scientific research institutions established in the Mainland can also enjoy the tax incentive of technological innovation.These measures have effectively promoted scientific and technological cooperation between the Mainland and Hong Kong.

In addition to state support, Hong Kong also has many advantages in developing international innovation and technology hub, including: (1) laws and intellectual property systems are relatively complete, and tax systems are internationally competitive; (2) As a major international financial centre, Hong Kong can provide diversified and international financing channels for innovation and technology enterprises; (3) As an independent customs zone and a free port, Hong Kong has the convenience of conducting scientific and technological exchanges and transactions with worldwide. The expansion of the science and technology park will help improve Hong Kong's conditions in the industrialization of science and technology and make up for the shortcomings of innovation and technology development.

However, we must also see that the overall technological strength and innovation level of the GBA still has a certain distance from the major international innovation and technology centers. According to the assessment by the Global Competitiveness Report 2018, Hong Kong's innovation capability ranks 26th among 140 economies, significantly behind other Asian four dragons (Taiwan's ranking 4th, South Korea 8th, Singapore 14th). The Chinese mainland ranks 24th, still a certain distance from the European and American technology powers. Taken together, GBA's overall innovation capability still has a lot of room for improvement.

The innovation ecosystem model proposed in the Global Competitiveness Report includes five major factors: R&D investment, especially R&D investment of private enterprises, diversification and interaction of technology industry, technology entrepreneurship culture, commercialisation, and science and technology policies and regulations. In terms of these factors, both Hong Kong and Guangdong have certain deficiencies.

For a long time, Hong Kong's industrial restructuring and development relied mainly on the market. It is good at intermediaries or transit business, forming a business culture that makes quick money. The shortcomings in the development of innovation and technology include the government's scientific research funding is increasing (the government commits to increase the proportion of R&D funding to GDP by 1.5% in 2022), but private enterprises, especially large enterprises with financial resources, are under-invested; the local market is small, and the commercialization of scientific research results is narrow; Insufficient venture capital resources; high property prices and rents, high entrepreneurial costs; Hong Kong's labor market is in a state of shortage, employment is easy, young people have high opportunity costs for entrepreneurship, entrepreneurial enthusiasm is relatively low. Guangdong's basic scientific research strength and subject coverage have been relatively mediocre, which is the main shortcoming of innovation and technology development.

From the perspective of developing innovation and technology, Hong Kong and Guangdong have different shortcomings. However, the shortcomings of Guangdong are basically the strengths of Hong Kong. The shortcomings of Hong Kong are basically the strengths of Guangdong. The combination of Guangdong and Hong Kong can greatly enhance the comprehensive conditions and capabilities for the development of innovation and technology in the GBA. Therefore, the close cooperation between the urban agglomerations of the GBA, achieving complementary advantages is a key factor for the success of the Bay Area International Innovation and Technology Center.

In addition, compared with other economically developed bay areas in the world, the GBA, which covers the three administrative regions of Guangdong, Hong Kong and Macao, has a relatively large area and population. However, under the "one country, two systems" situation, Hong Kong and Macao have their own legal systems, monetary and financial systems. They are also a separate customs territory, having border inspections among three places. These particularities are not found in other developed international bay areas and are a distinctive feature of this GBA. The institutional mechanism of Hong Kong is conducive to promoting the development of the GBA into a relatively open and international economic zone, and is an advantage of the construction of the GBA. However, the differences in the system among the three places have also brought inconvenience to the integrated development of the International Innovation and Technology Center in the GBA.

GBA Innovation Technology Corridor has broad prospects

The GBA is currently the largest manufacturing center in the world with the most complete value chain. In recent years, under the active guidance of government policies and the promotion of market forces, the manufacturing industry in the GBA is transforming towards a higher-tech and higher value-added industry. A large-scale Innovation and technology corridor connecting the Guangzhou, Dongguan, Shenzhen and Hong Kong is forming. The ambition to construct the GBA International Innovation and Technology Center will accelerate the formation and development of this innovation and technology corridor.

The completion and opening of the Hong Kong section of the Guangzhou-Shenzhen-Hong Kong high-speed railway and the Hong Kong-Zhuhai-Macao Bridge have greatly improved the traffic conditions for the urban agglomerations in the GBA. The east and west wings of the GBA, especially the Guangzhou, Hong Kong and Shenzhen, will be able to give full play to their respective advantages and carry out multi-channel and multi-faceted complementary cooperation in the construction of the International Innovation and Technology Center. This can also provide favorable conditions for the GBA Innovation and Technology Corridor to extend from the east to the west and work together to build a high-tech industrial chain. From the perspective of comparative advantage, in the future, Guangzhou and Shenzhen have an advantage in the research and development and manufacturing of innovation and technology products, the industrialization of scientific research results, the aplication of technology and the expansion of the domestic market; Hong Kong and Macao can play a greater role in basic and applied research, technology financing and trading, technology application and overseas market expansion.

Many successful international innovation and technology centers, such as Israel, Switzerland and Denmark, have some common development experiences. For example, the government's investment and support, and the innovation and technology policies that keep pace with the times, have a good working and living environment that attracts international scientific and technological talents. A dynamic and powerful private technology enterprise with developed market-based equity financing channels. These elements are organically combined with depth. After 40 years of investment and efforts, Israel has developed into a world innovation and technology powerhouse and a major global innovation and technology base in an environment of poor conditions. Israel's development experience is worthy of study and can be used for reference in the GBA.

Guangdong, Hong Kong and Macao have achieved great success in the cooperation and achieved good synergy over the past years. Building the Guangzhou-Shenzhen-Hong Kong-Macau Innovation and Technology Corridor and constructing the GBA International Innovation and Technology Center, can deepen cooperation between the Mainland and Hong Kong and Macao. It can also enhance the leading role of the GBA in national economic development and opening up. The meaning is profound and the task is difficult. In the future, The GBA needs to increase investment in scientific research, continuously improve basic research and applied basic research capabilities, create better conditions to attract international innovation and technology talents, and cultivate a number of new multinational technology companies.

Under the framework of "one country, two systems", Guangdong, Hong Kong and Macao need to act in accordance with the Constitution and the Basic Law in the process of building the GBA International Innovation and Technology Center. "Brothers need to work hard on their own to climb mountains", but the key is to make good use of the benefits of the "two systems" and strengthen closer cooperation to make the GBA achieve greater synergy. Future areas of cooperation include: (1) strengthening the communication and coordination of innovation and technology policies, striving for the connection between the technology systems; (2) encouraging private enterprises to increase investment in research and development; and (3) promoting cross-border trade in innovation and technology achievements and lifting the industrialization ability for innovation and technological achievements; (4) providing facilitation for the Bay Area technology companies to use the Hong Kong markets for financing and operations; (5) Cultivating an integrated innovation and entrepreneurial environment in the GBA, and building the GBA into an innovation and entrepreneurial paradise that can give entrepreneurs freedom and support, give space to winners, and give losers opportunities, and jointly build a high-tech industrial chain in the Bay Area including R&D, transformation of results, financing, production and sales.

主要經濟指標(Key Economic Indicators)

一. 本地生產總值 GDP	2016	2017	2018/Q2	2018/Q3
總量(億元) GDP($100 Million)	23,586	25,432	6,352	6,761
升幅(%) Change(%)	1.9	3.8	3.5	2.9
二. 對外貿易 External Trade			**2018/12**	**2018/1-12**
外貿總值(億元) Total trade($100 Million)				
總出口 Total exports	35,882	38,759	3,399	41,581
進　口 Total imports	40,084	43,570	3,912	47,214
貿易差額 Trade balance	-4,201	-4,811	-512	-5,633
年增長率(%) YOY Growth(%)				
總出口 Total exports	-0.5	8.0	-5.8	7.3
進　口 Imports	-0.9	8.7	-7.0	8.4
三. 消費物價 Consumer Price				
綜合消費物價升幅(%) Change in Composite CPI(%)	2.4	1.5	2.5	2.4
四. 樓宇買賣 Sale & Purchase of Building Units			**2019/01**	**2019/01**
合約宗數(宗) No. of agreements	73,004	83,815	5,589	5,589
年升幅(%) Change(%)	-4.1	14.8	-22.6	-22.6
五. 勞動就業 Employment			**2018/9-2018/11**	**2018/10-2018/12**
失業人數(萬人) Unemployed(ten thousands)	13.3	11	11.1	10.5
失業率(%) Unemployment rate(%)	3.4	2.9	2.8	2.8
就業不足率(%) Underemployment rate(%)	1.4	1.1	1.2	1.1
六. 零售市場 Retail Market			**2018/12**	**2018/1-12**
零售額升幅(%) Change in value of total sales(%)	-8.1	2.2	0.1	8.8
零售量升幅(%) Change in volume of total sales(%)	-7.1	1.9	0.2	7.6
七. 訪港遊客 Visitors				
總人數(萬人次) arrivals (ten thousands)	5,665	5,847	658.6	6,514.8
年升幅(%) Change(%)	-4.5	3.2	17.9	11.4
八. 金融市場 Financial Market			**2018/11**	**2018/12**
港幣匯價(US$100=HK$) H.K. Dollar Exchange Rate (US$100 = HK$)	775.6	781.4	782.4	783.4
貨幣供應量升幅(%) change in Money Supply(%)				
M1	12.3	9.8	-0.3	-0.4
M2	7.7	10	3.5	4.3
M3	7.7	10	3.5	4.3
存款升幅(%) Change in deposits(%)				
總存款 Total deposits	9.1	8.7	4.1	5.0
港元存款 In HK$	9.4	11.6	3.3	3.6
外幣存款 In foreign currency	8.8	5.9	4.9	6.4
放款升幅(%) in loans & advances(%)				
總放款 Total loans & advances	6.5	16.1	5.3	4.4
當地放款 use in HK	7.4	15.5	5.9	5.4
海外放款 use outside HK	4.5	17.4	3.9	2.1
貿易有關放款 Trade financing	0.2	8.7	-6.8	-7.6
最優惠貸款利率(%) Best lending rate (%)	5.0000	5.0000	5.1250	5.1250
恒生指數 Hang Seng index	22,000	29,919	26,507	25,846