WORKING PAPER NO. 19
HIGH-TECHNOLOGY DEVELOPMENT IN THE PEARL RIVER DELTA REGION

Purpose

1. The purposes of this Paper are to examine the High-technology development in the Pearl River Delta region and postulate some possible means of cooperation between Hong Kong and the neighboring cities in the Pearl River Delta region in the High-technology sector.

High-technology Development in the Guangdong Province

2. Since the mid-eighties, the Guangdong Province has increasingly placed emphasis on High-technology activities as the engine for driving its economic growth. In 2000, the total value of the Guangdong Province's High-technology products came up to about 284.6 billion yuan, occupying about 17.2% of the total value of industrial products made in the Guangdong Province.

3. There are a number of opportunities that allow the Guangdong Province to develop as a High-technology industrial base. They are:
   i. the economy of the Guangdong Province has a healthy and steady growth;
   ii. the Government of the Guangdong Province has provided a good administrative framework;
   iii. the rapid development of the market mechanism;
   iv. the economy is more open to foreign interests and gears toward international standards;
   v. the economy is multi-faceted and is akin to the development of High-technology products; and
   vi. enjoying better access to foreign information and markets as the Guangdong Province is situated close to Hong Kong and Macau.

4. On the other hand, the Guangdong Province also faces a number of challenges in developing High-technology industries:
   i. its level of development is still not high enough to offer any real international competition;
   ii. its technological base to support High-technology development is still weak; and
   iii. its financial environment, such as source of funding for fostering high technological development, still needs improvement.

5. In order to strengthen and quicken the development of new and High-technology industries in the Pearl River Delta region, the Guangdong Provincial Government in its Tenth Five Year Plan of the Guangdong Province has set the following development objectives:
   i. to become a connecting point with international economic services as well as one of China's most important new and High-technology industrial research, production and export bases; and
   ii. to form a new system that is vibrant, open, innovative market-oriented, based on efforts of private enterprises and relied on technical outputs of universities and scientific research institutes.

6. It is expected that by 2005, by the end of the Tenth Five Year Plan of the Guangdong Province, the following can be achieved:
   i. the new and High-technology industrial output would occupy about 20% of its total industrial output;
ii. the value-added of High-technology industries would occupy about 23% of its total;

iii. the new and High-technology industrial exports would occupy about 20% of its total;

iv. research and development expenses would occupy about 1.5% of the GDP; and

v. 26 out of every 10,000 persons would engage in technological activities.

7. On the basis of spatial development pattern, development of High-technology industries in the Guangdong Province will be concentrated in Guangzhou and Shenzhen. These two will form the two main foci of the Pearl River Delta new and High-technology industry belt. The Guangdong Province will rely on this Pearl River Delta new and High-technology industry belt as the backbone for its High-technology development, and this belt will also facilitate the development of the east and west peripheral areas and the hilly region of the Province.

8. On a development project basis, the main focus of development in the Guangdong Province will be on the following areas:-

i. Guangdong Information Technology (IT) Industries Corridor (廣東信息產業走廊). The cities within this Corridor comprise Ziaoqing (electronics chips and products), Foshan (audio-visual and electronics products) Guangzhou (software and telecommunications products and source of technology), Dongguan (computer products and electronics products), Shenzhen (telecommunications and audio-visual products, and computer hardware and software) and Huizhou (audio-visual and telecommunications products). These cities focus on information technology and telecommunications products, computer software and communication equipment.

ii. Ethylene processing bases (乙烯深加工基地). These ethylene processing bases which are located in Mouming Guangzhou, Huizhou and Shantou would help to facilitate the using of new material in production processes.

iii. Guangzhou International Biotechnology Island (廣州國際生物島) and the Zhongshan National Health Technological Industrial Base (中山國家健康科技產業基地). Both are important to facilitate the development of biotechnology and pharmaceutical research in Guangdong.

iv. Guangdong Optics Valley (廣東光谷). This would serve as a catalyst for the development of photoelectronic industries in the Guangdong Province.

9. The High-technology products produced by the Guangdong Province mainly comprise four groups: digital data, opto-mechano-electronics integration, new materials, and biological technology. 90% of these High-technology products were produced in Guangzhou and Shenzhen. In 1999, large and medium size business enterprises research and development funding came up to about 85% of the provincial total, which was about 6 billion yuan.

10. The Guangdong Province has also introduced several preferential policies concerning tax and finance, including priority treatment in the processing of export rebates and expediting depreciation in a bid to encourage investment by industrial enterprises in new and High-technology. Enterprises rated as technology innovators and established in new- and High-technology development zones may enjoy tax breaks offered by the State Council, Ministry of Finance and State Administration of Taxation. Export goods of new and High-technology enterprises will be given priority treatment in export rebate or tax exemption.

11. A series of regulations on strengthening means to attract investment and upgrade the technological level of enterprises has also been effected. Under the regulations, financial preferences are granted to enterprises committed to technological renovation. The preferential policies include:

i. Following confirmation by finance and tax authorities, eligible enterprises may accelerate the rate of depreciation of their fixed assets.

ii. More technology innovation funds will be made available and special discount will be granted to technology innovation loans. In order to encourage collective, corporate and individual investment in enterprises carrying out technological innovation, intellectual property such as special technology, licenses technology, brand names or sales networks can be used as investment inputs. The value of such intangible assets can account for up to 35% of the enterprise's registered capital.

iii. Enterprises using allocated land as the basis for attracting capital and equipment for carrying out technological reform, after paying the land transfer fee, can use the land use rights as their contribution to investment.

**High-technology Development In Guangzhou**
High-technology Development In Shenzhen

12. Guangzhou, as one of the core cities in the development of the Guangdong Province, will speed up its new and High-technologynological industrial development to cultivate the city's new economic growth points. Priorities will be given to industries dealing with software development, integrated circuit, fibre-optics communications, genetic engineering, oceanic biological products, pharmaceutical and Chinese medicine products. Information technology industries are particularly chosen as the main focus of this High-technologynological industrial development. This include mobile telecommunications products, high resolution digital audio-visual products and integrated circuit products. There are three main industrial bases for these products in Guangzhou:-

i. Software products industrial bases. This comprises the Tinhe computer software park (天河軟件園), Guangdong software science park (廣東軟件科學園), Nansha information technology community (南沙資訊科技園區), and Huanghuagang information technology park (黃花崗信息園).

ii. Computer production base. This relies mainly on the Guangzhou tax bonded area for the production of computer and other information technology products.

iii. Photo-electronic products industrial base. The Guangdong Optics Valley (廣東光谷) will serve as an anchor to attract multi-national organisation and international research institutes to facilitate the development and production of photo-electronics products.

13. Apart from the above development, there are also two other important High-technology bases in Guangzhou. They are:-

i. Guangzhou Silicon Valley (廣州硅谷) or the Guangzhou new and High-technology district (廣州高新區) with an area of 28.14km² comprising the Guangzhou Science City, (廣州科學城) Tinhe technology park (天河科技園), Huanghuagang technology park (黃花崗科技園) and private-sector operated technology park (民營科技園). It centers around Guangzhou Science City project (which has an planned area of 22.74 km²). It combines servicing, innovative and production activities in one place. Within this district it has 12 universities and colleges like Hua Nan Polytechnic University (華南理工大學), Hua Nan Agricultural University (華南農業大學), Kei Nan University (暨南大學) and some 20,000 science and technical professionals. In 2000 the whole district's production value amounts to some 155 million US dollars.

ii. Nansha Information Technology Community (南沙資訊科技園區) which is a joint venture project undertaken by the Fok Ying Tung Foundation and the Hong Kong University of Science and Technology. It occupies an area of 250 ha. It is envisaged as a high-quality, IT-based, user-friendly and environmentally harmonious residential community in a Chinese cultural setting. The first two phases of the project, which will be completed by 2004, provide facilities (including 4 commercial buildings, information technology park, hotel, logistics centre, new ferry pier) for professional training on many levels, on-site and distance conferencing, software technology research and business development and residence. In its final phase of development which will be completed by 2008, the community will incorporate a High-technology manufacturing facility utilizing the latest clean production technology. When it becomes fully operational, it aims to become a world-class centre of technology and serves as a model for future development in southern China.

High-technology Development In Shenzhen

14. Ever since the 1990s, Shenzhen has given top priority to the development of High-technology industries. Since 1992 High-technology industries has been growing at an annual rate of 55%. In 1999, the output of High-technology industries amounted to 41% of the total industrial output, which was much higher than the national average level of 15%.

15. In May 2000, the third Party Congress of Shenzhen Municipality reiterated that "High-technology industries are primary in promoting economic growth of Shenzhen and the key to top-notch development in the 21st century, technological innovations should be encouraged, environment bettered, mechanism created and policies introduced in order to turn Shenzhen into a High-technology city."

16. Shenzhen has actively sought to attract domestic and foreign investment and provide measures to encourage High-technology development by increasing research and development expenditure, listing of stocks, tax concession, talent scouting, introducing a government reward system and establishing a virtual university park.

17. At present, Shenzhen is home to more than 1,500 makers of computer components, 500 software companies and 200 research and development centres. It has become the centre of five important High-technology industries: information technology, biotechnology, new materials technology, opto-mechanical-electric industries and laser industries. In particular, the information technology has become the primary pillar of High-technology industry in Shenzhen, Zhongxing New Telecommunication and Huawei Technologies, two of Mainland's most successful telecoms companies are based in Shenzhen. The output of information technology amounts to half of total output of Guangdong Province.

18. In Sept 1996, Shenzhen Government had established the High Technology Industrial Park Zone in Nanshan (南山) district. It occupies an area of 11.52km² and is one of the 53 national High-technology industrial park zones supported by Central
Ways and Means For Cooperation

19. Shenzen was the location to house the first China High-technology Fair. It was jointly organized in October 1999 by the Minister of Foreign Trade and Economic Cooperation, Ministry of Science and Technology, Ministry of Information Industry, Chinese Academy of Sciences, and Shenzen Municipal People's Government under the auspices of the State Council. Major topics that had been discussed included the current and future developments of high technology, information technology in the 21st century, biotechnology and pharmaceuticals, new materials and new energy, and related issues such as knowledge-based economy and international strategy, investment in high technology, finance, securities and risk investment. The Second Fair has been held in October 2001. Henceforth the Fair will be held in autumn every year.

20. The Shenzhen has actively encouraged the development of venture capital. The Shenzhen Venture Capital High Technology Industry Temporary Regulations ("Venture Capital Regulations") was passed on 8 October 2000 by the Twelfth Session of the third meeting of the Standing Committee of the Shenzhen People's Government. Effective 11 October 2000, the Regulations are the first legislation governing venture capital in the Mainland. Together with plans to adopt a second stock listing, the Venture Capital Regulations dovetail with Shenzhen's ambitions to establish itself as a center for high technology industry. Venture capital companies will be entitled to a variety of tax preferences including exemptions and tax holidays from enterprise income tax and value-added tax. The Venture Capital Regulations are significant in two respects: First, together with Shenzhen's second stock listing, they significantly advance Shenzhen's ambition to become a leading center of High-technology in the Mainland. Second, they are the first legislations advancing a capital-raising scheme in which stated-owned enterprises are actually discouraged from participating.

21. The Mainland's accession to the World Trade Organization will mean improved access to the Mainland markets, increased trade between the Mainland and the developed economies, increased transparency in trade regulations, closer integration and cooperation in trade and tariff negotiations, and further liberalization of the Mainland's services sectors. Offering expertise and funding opportunities will be essential to the middleman role Hong Kong will play in helping the Mainland to modernize. It is considered that Hong Kong should strengthen its traditional role as an international financial center, a conduit of foreign investment to the Mainland, a telecommunications hub, and a strategic location for overseas firms. In so doing, Hong Kong can exercise its strength as a "pool" of sophisticated service professionals and its status as Asia's second biggest capital market. Cooperation in sectors requiring high technology and skills is one of the key elements to economic development for the Mainland and Hong Kong and will bring mutual economic benefits.

22. Guangdong and Hong Kong have been close economic partners for the past 20 years and the two are economically important to each other. Hong Kong has a dynamic service economy that is integrated into and plays a leadership role in the fastest growing economic region in the world. It performs high-value-added, knowledge-intensive activities and takes advantage of the resources such as technical capabilities, low cost base and plentiful labor available in the neighboring cities in the Pearl River Delta region for physical production stages.

23. There is a need to examine the potentials of the cities within the Pearl River Delta region for High-technology development. Hong Kong's relationship with these cities is no longer built on a competition or a 'shop at the front factory at the back' basis, it is more on a complementary and cooperation basis. Traditionally, Hong Kong has not been strong in technological invention or in the manufacture of High-technology components/equipment. Hong Kong does not have tax incentives to attract multi-national technology companies to invest in Hong Kong. However, Hong Kong is good at using High-technology applications and facilities to promote competitiveness. It has good business linkages and network, and has better market information. With strong international experience and concentration of financial institutions, Hong Kong can provide the expertise in marketing, management, finance, legal and contractual matters. Hong Kong also has the experience in providing high quality services. Guangdong on the other hand is already attracting a critical mass that will enable it to develop a broad-based technology industry such as developing computer software application. It has a good and relatively cheap labour force and inexpensive land for High-technology manufacturing development. Offering high wages and opportunities for further development, Guangdong has also the ability to attract Mainland scholars, scientists or experts with high technological skills to settle in major cities in the Pearl River Delta area.

24. There are possible ways and means to strengthen the co-operation of High-technology sector between Guangdong and Hong Kong. The followings are some of the options put forward by some academics and commentators:-

i. to reinforce the co-ordination and co-operation of government policies and actions on High-technology industries between Guangdong provincial and Hong Kong governments by defining the functions and roles of two parties concerned. Hong Kong is suggested to perform mainly high-value added services while Guangdong aims to become a High-technology industrial production base;
to jointly pull in resources to improve the traditional industries and promote new and High-technology industries, such as bio-technology, and new material and techniques to improve agriculture, medicine, food processing and light and textile industries;

iii. to utilise Hong Kong's banking and financial services to help securing funds and loans for owners/operators of High-technology establishments. The Growth Enterprise Market, a NASDAQ like stock market established in Hong Kong provides good opportunities for small manufactures and enterprises to raise public fund via the Hong Kong stock market;

iv. to introduce means to facilitate the flows and movement of High-technology personnel and experts between Guangdong and Hong Kong;

v. to utilise Hong Kong as a base to develop intellectual property rights and managing these rights;

vi. to utilise Hong Kong as a window for access to more up-to-date technical and scientific information and to world markets.

Strategic Planning Implications

25. There are a number of ways in spatial development terms that we can explore the co-operation of High-technology development between Hong Kong and the Pearl River Delta region.

26. There have been suggestions put forward by private organisations/bodies such as the One Country Two Systems Research Institute and the Hong Kong China Relation Strategic Development Research Fund to utilise areas within the Frontier Closed Area, such as the Lok Ma Chau Loop for High-technology development, science and technology research centre and Chinese medicine/pharmaceutical development. High-technology development area/ industrial parks have been suggested to be developed to provide business opportunities for investors from Hong Kong or overseas and jobs for experts and technical staff in Shenzhen and other areas in the Pearl River Delta region.

27. Apart from the above proposal, the Shenzhen authorities have drawn up their planning proposals for the Lok Ma Chau Loop. During an informal visit by Shenzhen officials on 8.2.2001, a report on cross-boundary links prepared by Shenzhen Urban Planning and Land Administration Bureau was passed to the Hong Kong for information. The report has included Shenzhen's suggestions for developing the Lok Ma Chau Loop including residential, commercial and High-technology industries.

28. However, in spite of its wide and expansive coverage, the Frontier Closed Area (including the Lok Ma Chau Loop) faces a number of major development constraints such as lack of infrastructure facilities (roads, trains, sewerage and water supply), the need for conservation, the need to maintain a buffer zone to facilitate effective operations against illegal immigration, smuggling and other cross-boundary crimes. These factors need to be overcome if any development is to take place within the Frontier Closed Area.

29. Another form of development co-operation on High-technology development is for Hong Kong to identify an area in the Pearl River Delta region and jointly developed the area with Guangdong authorities for High-technology industries or businesses. Professor Woo Chia-wei has proposed a Hong Kong Bay Area concept that includes a belt of High-technology development and high-quality landscaped area in the Pearl River Delta region. It includes the Hong Kong University of Science and Technology, the Shenzhen High-technology Industrial Park and the Nansha Information Technology Park in Panyu, which now falls within the administrative boundary of Guangzhou city. This idea of jointly developing Nansha for High-technology development subsequently is taken up by the Hong Kong administration. On 25.7.2001, at the fourth meeting of the Hong Kong/Guangdong Co-operation Joint Conference in Hong Kong, Guangdong and Hong Kong signed a Letter of Intent for Economic Development considering the development of Nansha would help promote the economic development on both sides. An expert group would be set up to look into plans to develop Nansha, which might include the development of new High-technology industries, transport and logistics services, as well as training and exchange of talents.

Bibliography

Shenzhen Urban Planning & Land Administration Bureau, *Shenzhen Comprehensive Plan (1996-2010)*

Saywell Trish, "Watch Your Back", *Far Eastern Economic Review, September, 1999*

Blayney Steven, "Shenzhen Venture Capital Regulations Open the Door to Foreign Investment", *Asian Lawyer, December 2000*

Tse John C.Y., "Developing a Silicon Valley Culture in Hong Kong and Mainland China", *The Hong Kong Policy Research Institute Policy Bulletin 4, The Hong Kong Policy Research Institute*

Chow Cyril C.K., "Information Infrastructure in Hong Kong", *The Hong Kong Policy Research Institute Policy Bulletin 4, The Hong Kong Policy Research Institute*

Kwok K.C., "Hong Kong's Opportunities and Challenges in the Global Economy": (Interview) *The Hong Kong Policy Research Institute Policy Bulletin 17, The Hong Kong Policy Research Institute*

一國兩制研究中心 深圳高科技產業發展概況 2000年九月

許明達(編) 21世紀-深圳高科技產業發展的調查與研究 海天出版社 1999

左連村 王洪良 “粵港澳科技合作研究” 反思與前瞻 鄭宇碩等編 2000 p.245-252

封小雲 “粵港合作發展創新科技產業的思路” 反思與前瞻 鄭宇碩等編 2000 p.253-260

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