

Hong Kong's Communication Infrastructure: The Evolving Role of a Regional Information Hub

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Introduction

Changes overtaking the telecommunications industry are giving it a central role in the development of the information economy. As an open service economy, Hong Kong's future growth depends largely on the successful diffusion of these technologies, and this is true also for Hong Kong's immediate regional competitors: Japan, Singapore, South Korea and Taiwan. Part One of this chapter examines these issues, and concludes with a review of the information market in Hong Kong. Part Two then examines Hong Kong's policy towards telecommunications network and network services competition, and how policy towards telecommunications and the diffusion of information technologies will affect Hong Kong's role as a regional hub in the post-1997 era..

PART 1: Information and Telecommunications Markets.

Intelligence in the network has transformed the recent story of telecommunications. A decade ago, when the world's leading telecommunications companies were just beginning to introduce electronic switching into their networks, the intelligence of network functions was programmed into the central switch. As switching costs fell relative to the costs of transmission it became economical for telecommunications users to install switching and intelligent functions along different points of the transmission paths, such as in the PABX - private automatic branch exchange, or switchboard - of corporate and

multi-tenanted buildings, and in terminals - customer premises' equipment, or CPE - such as PCs, facsimile machines, and ordinary telephone handsets. The result of these changes, which are most advanced in the United States,¹ has been to move away from centralized star-shaped network configurations towards a fully-meshed network of sub-networks, a kind of national grid.

This has profound implications for the nature of the telecommunications industry. First, and foremost, it transforms the telecommunications network into an intelligent information highway. The network becomes the infrastructure of the information economy. Second, it facilitates the development of virtual networking, which in this context means the ability of any sub-set of users of the public switched telephone network (PSTN) to establish their own user-group network, which may be embedded entirely within the public network, or may cut across it, as happens when communications takes place using computer networks which connect to each other across the public network. The physical and spatial constraints placed upon networking are being further broken down by the growing use of mobile radio communications. Future generations of personal communication networks, PCN or personal communications systems PCS, which will assign communications to the person - by means of a smart card - rather than to a location or to a terminal, will be to accelerate this process. **(See chapter 1).**

¹ See Huber, P.W. 1987. The Geodesic Network 1: 1987 Report on Competition in the Telephone Industry. Washington D.D., US Department of Justice, Anti-Trust Division; and Huber P.W., M.Kellogg and J.Thorne. 1992. The Geodesic Network 11: 1993 Report on Competition in the Telephone Industry.

These changes in technologies, and the way they are deployed, promise widespread social accessibility to electronic communications, and to intelligent networks. For Hong Kong, an island-economy dependent upon its competitiveness as a world financial and trading centre, and as an entrepot to China, the challenge of information technologies is particularly intriguing.

On the one hand, Hong Kong is dependent upon the excellence of its communications - road, rail, sea, air and telecommunications - to remain the favoured location for the regional headquarters and offices of multinational companies in Southeast Asia.

According to a survey by the Industry Department in 1994² there are over 7,000 overseas companies operating in Hong Kong,³ and of the 2,993 who returned questionnaires, over 90 per cent gave the two primary reasons for choosing Hong Kong as the excellence of banking and financial facilities, and infrastructure. Globally, the banking and financial sectors are among the leading adopters and users of information technologies, and given that Hong Kong's latitude provides it access to the world's leading financial markets throughout the day - 12 hours ahead of New York, 8 hours ahead of London, 1 hour behind Tokyo - online information markets are in constant use.

On the other hand, the great majority of Hong Kong's businesses are small and medium-sized enterprises, employing less than 200 staff, and usually fewer than ten. The traditional Chinese family business is not a user of high technology. The information

² Hong Kong Government Industry Department *Report on the 1994 Survey of Regional Representation by Overseas Companies in Hong Kong*. (1994)

technologies which have proved most popular are mobile telephones, pagers and facsimile machines, all adaptable technologies and with no Chinese-language software problems to be solved. So the Hong Kong market is rather stretched between high-end demand for sophisticated information and medium and high-speed data transmission and processing, and low-end demand for flexible and inexpensive voice and image transmissions.

The intriguing challenge for Hong Kong is how it develops the use of middle range information technologies, such as information services, inter-active consumer services, and perhaps most important of all, business applications of these technologies - for instance, the design of software, the manufacture of components such as visual display units, or the marketing of transactions technologies. Hong Kong shares with Singapore, South Korea and Taiwan the need to develop both a production and usage capability in this intermediate range of information technologies, as a way to accomplish the transition to a higher level of value-added production in its manufacturing and service industries. In the case of Hong Kong, with political uncertainties about its future looming, this is especially important. Multinational capital can leave Hong Kong as easily as it came, and only the sound underpinning of a productive economy will guarantee a stable economic future.

Regional comparisons

³ By comparison, around 3,000 multinationals use Singapore as a hub, according to Singapore Telecom *Annual Report 1992-3*, p.7.

Each of the dragon economies faces the problems of the transition, and each is tackling it in their different way. In Asia, only Japan overshadows them in the scale of infrastructure, and the approaches of Singapore, South Korea and Taiwan all have more similarity to the Japanese approach than does the ‘positive non-intervention’ which characterizes Hong Kong’s philosophy.⁴

Japan

The size of the Japanese economy ensures that it dominates the information markets of East Asia,⁵ and yet by comparison Hong Kong’s infrastructure remains impressive. For instance, while Japan’s telephone network operated 58 million lines in 1992, compared to Hong Kong’s 2.8 million, according to the *World Telecommunication Development Report*⁶, these figures represented 47 mainlines per 100 inhabitants in Japan and 49 mainlines per 100 inhabitants in Hong Kong. Singapore operated 42, Taiwan and South Korea 36 each.

The basic infrastructure for the information highway is the public switched data network, or PSDN. In an era when the PSTN was essentially analogue, the PSDN was a physically separate overlay network, but in modern digital networks the PSDN is virtual in the sense

⁴ The term ‘positive non-intervention’ was first coined by senior government official Sir Hadden-Cave, P. 1989. Introduction. In *The Business Environment of Hong Kong*. ed. Lethbridge, D.G. Hong Kong: Oxford University Press. For further discussion see Day, J.J. ‘Hong Kong’ in *Telecommunications in the Pacific Basin: An Evolutionary Approach*. Eds Noam, E. and S. Komatsuzaki, D.A. Conn. Oxford University Press. For a detailed account of what it means in practice, see Chen K.Y. and K.W. Li (1991) ‘Industrial development and industrial policy in Hong Kong’ in *Industry and Trade Development in Hong Kong*. Eds. Chen K.Y. and M.K. Nyaw, Y.C. Wong. Hong Kong. Centre of Asian Studies, University of Hong Kong.

⁵ A report by CIT, a UK-based consultancy company, forecasts the market in value-added services in Asia will grow from US\$800 million in 1993 to US\$2.89 billion by 2003, and of this one-third will come from managed data network services in Japan. See *Asia-Pacific Telecommunications* January 1995, p.3

that it consists of circuits assigned to data transmissions within the PSTN. In Hong Kong, Hong Kong Telecom provides these circuits as packet-switched services (PSS) and direct digital services (DDS - private leased circuits) and circuit-switched services (CSS - a form of PSS which pools packets of data from different senders down a common transmission path) under the name trade-name Datapak. In 1991 nearly 30,000 lines were in service for a population of 5.7 million (1991 Census), or one for every 193 inhabitants. In 1991 in Japan over 300,000 were in service for a population of 123 million, or one for every 410 inhabitants. In Taiwan there was one for every 426 inhabitants, and in South Korea one for every 1000.⁷ In China by the start of 1995 there were around 4,000 subscribers for leased circuits in the Digital Data Network (DDN) which was opened in October 1994. The DDN reaches into 22 capitals of China's 30 provinces, municipalities and autonomous regions providing 3,360 ports, and 20 cities now have their own local DDN network.⁸ In addition, Chinapac, a packet-switched network, covers over 600 cities and provides over 6,000 ports.

As early as 1983 Japan adopted a strategic approach to the development of telecommunications with the Teletopia Project which aimed to spur regional development through the diffusion of new technologies, such as cable television, CAPTAIN - a nationwide videotex system - and data communications. The private sector was

⁶ International Telecommunications Union, 1994.

⁷ Rather typically, Singapore Telecom fails to provide comprehensive information, an irony for a carrier in an Intelligent Island. The *World Telecommunication Development Report* (ITU, 1994) estimates only 460 lines, or one for nearly 6,000 inhabitants, clearly a gross under-estimate, but its estimates for Taiwan and Hong Kong are also too low by at least half. (The figures in the text for Hong Kong and Taiwan are derived from annual telecommunication reports.)

⁸ See *China Posts and Telecommunications 1994 Annual Report*. Ministry of Posts and Telecommunications, Beijing; also *Asia* 25 April 1995, p.8, Pyramid Research, Cambridge, MA.

encouraged to participate through five types of special facility: telecom plazas, to educate the public about new media systems and products; telecom research parks to promote research and development in telecommunications technologies; teleports or satellite earth stations to serve as core communications facilities in the regions; multi media towers incorporating multiple antennas for joint radio transmissions; and special telecoms facilities to serve as information centres offering LAN services.⁹

Telecommunications carriers are divided into two types in Japan: Type One carriers are network operators, while Type Two carriers lease circuits from Type One carriers and offer value-added network services over them. Public sector investment in Japan was planned through the public Type One carrier, Nippon Telegraph and Telephone (NTT), which launched a basic rate interface ISDN¹⁰ - integrated services digital network - for high capacity transmissions in 1988, and a primary rate user-interface ISDN the following year. In 1989 Kokusai Denshin Denwa (KDD), Japan's main international carrier¹¹, did likewise. Despite its partial privatization, NTT was also required to adopt a US\$400 billion building plan for a nationwide optical fibre network, intended for completion in 2015.

⁹ See *Posts and Telecommunications in Japan: Annual Report 1992* (Ministry of Posts and Telecommunications, Tokyo, 1992)

¹⁰ The basic rate interface consists of two data channels and one signalling channel, or 2B+1D. The primary rate interface is 23B + 1D, allowing for speeds between 384Kb/s to 1.5 Mb/s, sufficient to carry transmissions ranging from G4 facsimile, to high-speed file transfer, to teleconferencing.

¹¹ KDD faces competition from two new entrants, International Digital Communications (IDC) and International Telecom Japan (ITJ). Similarly, NTT faces competition in the domestic long-distance markets from new entrants Japan Telecom and DDI. According to the Ministry of Posts and Telecommunications, by 1991 the new entrants had secured twenty-five percent of national data traffic.

In 1994 the Telecommunications Council, an influential advisory body to the Ministry of Posts and Telecommunications, proposed to bring forward the plan to 2010 and extend fibre-to-the-home (FTTH) - a fibre cable to every home and business - at an estimated annual cost of Yen 1 trillion (US\$100 billion).¹² The Japanese approach may not survive further efforts to privatize NTT unless a direct form of state subsidy is made available, but the policy direction is clear: the state intends to drive the infrastructure ahead of demand in the belief that supply will create its own demand.

Singapore

In Singapore planning is even more definitive. Under the IT2000 project, Singapore is to become the Intelligent Island by the end of the decade. (**See chapter 2.**) The National Computer Board's National Information Infrastructure (NII), part of IT2000, is designed to establish an island-wide computer network. The Economic Development Board (EDB) is promoting the telecommunications sector - equipment and components, facilities and services - as a leading sector for the island's economic growth, while the National Technology Plan of the National Science and Technology Board (NSTB) is promoting technology parks for research and development in the telecommunications industry. Singapore Telecom (ST), the partially privatized state-controlled monopoly PSTN operator, is installing broadband ISDN networks for these parks and around the island, to carry simultaneous transmissions of voice, data and moving image - including cable TV which is to be supplied by the Singapore Broadcasting Corporation.

¹² See *New Breeze* (Japanese ITU Association, Summer 1994, pp.14-18)

ST is also involved with Singapore Network Services (SNS) in providing an EDI system which the government requires the Port Authority and all companies dealing with government for trade documentation purposes to use. ST is also required to provide a Teleview¹³ (videotex) service to promote the use of electronic information in the schools and in the home. Ahead of Hong Kong, Singapore was able to provide ISDN on demand to all customers, and is now pushing ahead with a Fibre-to-the-Home (FTTH) project. Broadband ISDN trials are also underway.

South Korea

South Korea follows Japan in distinguishing between basic and value-added carriers. In South Korea, Network Service Providers (NSPs) are divided into General Services Providers (GSPs) who can operate national networks - Korea Telecom operates the PSTN - and Special Service Providers (SSPs) who are only allowed to operate special services in particular locations, such as the Korean Port Telephone (KPT) and various paging companies restricted to their regions. Value-Added Service Providers (VPSs), offering E-mail, EDI, online information services, and so on, operate in a liberalized market, and their numbers have risen rapidly in recent years. South Korea has been under pressure from US trade negotiators to open its markets, and in addition to VANS has also opened its IVANS - international value added networks services - markets. Among the VANS suppliers is DACOM (Data Communications Corporation), originally the national data

¹³ In all likelihood, Teleview will prove less successful in its take-up than other commercial forms of online information which are based upon PC terminals and popular market software packages. For a discussion of

communications subsidiary of Korea Telecom (KT). DACOM now offers nationwide videotex, and also competes head-on with KT for international traffic. In addition, there are two competing national cellular mobile telephone companies.

The state remains highly involved in the informatization of South Korea's national economy.¹⁴ A key component of South Korea's strategy is the National Basic Information Systems (NBIS) project begun in 1987, which is similar in aim to Singapore's National Information Infrastructure under its IT2000 project. Various initiatives are being undertaken to stimulate the use of PCs and the demand for online information. Part of NBIS is the Government Administration Information System (GAIS) which provides online databases offering government information across a range of departments. The Ministry of Communications aims at a PC in every household by 2000, and is planning to distribute up to 3 million PCs free. And not to be outdone by Japan, the Ministry is planning South Korea's own version of the Information SuperHighway, a national optical fibre network to be financed out of the sales of Korea Telecom shares.

Taiwan

In Taiwan the PSTN remains under the state monopoly of the Director-General of Telecommunications, or DGT, as part of the Ministry of Transport and Communications (MOTC), but in recent years the government has been planning, so far without success,

videotex developments in Asia see the essays in E.Kuo and K.C.Ho eds. (1995) *Heralding the Information Age: Videotex Development in the Asia-Pacific*. AMIC, Singapore.

¹⁴ For details of IT policy in the developing economies of Southeast and East Asia, see John Ure ed. (1995) *Telecommunications in Asia: Policy, Planning and Development*. Hong Kong University Press, Hong Kong.

to restructure the industry along the lines of the Japanese model. *The Telecommunications Modernization Plan* approved by the Executive Yuan in 1984, and the recommendations of the Council for Economic Planning and Development (CEPD) in 1986, set the stage for Taiwan's strategic thinking for the sector's reform and role in the informatization of the economy. Plans for a national highway and submarine optical fibre network are built into the 11th Four Year Plan (1994-1998), but funds for the project, which form part of the state budget, are vulnerable to periodic cutbacks.

In the case of each of the above, Japan, Singapore, South Korea and Taiwan, the state has taken a pro-active role in the building of the information infrastructure, in the stimulation of research and development in the equipment and components industry, and in the promotion of an IT culture in the small business and the residential markets. Large investments are involved, with returns upon them uncertain. The trend towards the privatization of national carriers, and the introduction of competition into all areas of telecommunications markets, raises a question mark over the future means and methods of long-term financing of the projects. In contrast to these supply-side driven strategies, Hong Kong has been following more closely its traditional commitment to demand-side marketing.

Information Markets in Hong Kong

The Hong Kong government's approach to information technology promotion is to fund research and development seedmoney for academic and private sector projects through bodies such as the Research Grants Council, Hong Kong Applied Research and

Development Funds Ltd, the Industry and Technology Development Council (ITDC), the Industry Technology Centre, the Vocational Training Council, the Hong Kong Productivity Council, and so on. The emphasis is upon supporting public sectors such as education and medicine, and the private sector, especially in the transfer of technology and skills training. The building of the network infrastructure is left entirely to the private sector, including the dominant carrier, Hong Kong Telecom (see below), and little effort has been made by government to encourage the use of online information. For example, the Government Information Service (GIS), which is the primary interface between government and the Hong Kong media, is not online - although file transfer is available, and in 1995 the teleprinter service was been replaced with a proprietary standard non-interactive online broadcast connection to the media, but not the general public - and only two government services, laws and the land registry, are provided online.

The domestic telecommunications markets have been liberalized, and value-added service providers who only operate private networks, or otherwise lease circuits from a public network operator, do not require a telecommunications licence to trade.¹⁵ International value-added network services, IVANS, have also been liberalized and the definition of what constitutes an IVAN - for example, store and forward voice - is being extended. (Telecommunications policy is discussed in greater detail in Part Two.)

Providing value-added services in Hong Kong is a highly competitive business, and is limited by the skewed industrial structure. As noted above, small and medium-sized

businesses are not major users of online databases. Estimates of the penetration of PCs vary. Survey Research Hong Kong Ltd. estimates 968,000 individuals aged 15 and over have a PC at home. A survey by the Telecommunications Research Project of the University of Hong Kong found 27.5 percent of households have a PC, which extrapolates to around 400,000 households, and Graham Mead and Associates for Datapro (Hong Kong) estimated business computers by the end of 1994 to number around 500,000. But very few of these PCs are networked. The Telecommunications Research Project survey found that no more than twenty per cent of respondents knew their home computer had a modem - a further eighteen percent were uncertain. The total number of PCs hooked up to Datapak services, the primary means of public networking in Hong Kong, may be no more than 50,000.

Alber's¹⁶ study of videotex systems in 1985 suggested four stages of development. The first, which he dates to 1983, consists of transmissions to dumb terminals, or VDUs (Visual Display Units). The second, 1984-88, spawned intelligent terminals in the form of PCs with software applications. The third, which he dated 1988-92, would see the growing availability of micro-computer power, with multiple ports for distributed terminal processing. The growing popularity of LANS and host-server configurations, and open network architectures, would create a spectrum of interactive possibilities. The fourth stage, which he anticipated to start around 1992, involves multi-media networks, such as cable TV and telephony combined, Video-on-Demand and computer applications.

¹⁵ Sometimes a distinction arises in the literature between VANS - value-added network services - and VAS - value-added services. The latter offer services over a network leased from the former.

¹⁶ A.F.Alber *Videotex/Teletex: Principles and Practices* (New York: McGraw-Hill, 1985)

Alber was spot on with his predictions. In Hong Kong stage four arrived in 1994, a trifle later than the USA, with cable TV and trials of VOD. Stage one was an experiment by the Hong Kong Telephone Company in 1982 with a videotex system called Viewdata. It never succeeded, despite an early emphasis on financial information.

Starting in 1985, stage two was also developed by the Hong Kong Telephone Company as Datapak, a service of dedicated and dial-up data lines to corporate customers with PCs terminals. Datapak remains the generic name for a range of data services, to which have been added ISDN transmission rates for corporate clients that require them. A fleet of interactive services, largely financial in nature, are marketed under the name Spectrum. Stage three, the era of distributed networking, has been confined to the largest of corporate enterprises, such as the dealing rooms of the large banks and securities houses, to wholesale and retail chains, to shipping lines and airlines, and to specialist users, such as travel agents. The closest the Hong Kong government has come to promoting networking is through its support of Tradelink, a consortium of leading corporations which has been franchised to operate an EDI gateway - Community Electronic Trading Service or CETS - between government departments and companies applying for certain types of trade documentation, such as Restrained Textile Export Licences which are issued under the Multi-Fibre Agreement, or MFA. **(For details and further discussion, see chapter 13.)**

In sharp contrast to Singapore, Hong Kong's approach is to phase in EDI gradually, a policy which seems to reflect a non-urgent approach within the government itself towards the adoption of information technology. Within the government the Information

Technology Services Department (ITSD) - elevated to department status following the 1991 Financial Circular (No.4/91) "Computerisation" - co-ordinates technology adoption strategies, with the primary aim of promoting civil service efficiency. As of early 1995 only two government databases - a law data base and a land registry data base - were on-line to the public outside government offices, and decisions to make future services on-line to the public, or to the business community, rest solely with the departments concerned and the government's Finance Branch, which has overall responsibility for any costs or revenues that may result. Two principal members of the ITSD summarized the policy succinctly in 1992.

"...no preferential treatment to the information technology sector has been given. The use of information technology in Hong Kong is requirement-driven rather than coordinated and promoted by the Government, apart from promotion through its own consumption. Such a stance is welcomed by the community and the IT industry at large." ¹⁷

Stage four is now on Hong Kong's horizon. Wharf Cable has begun MMDS - Multi-point Microwave Distribution Service - television transmissions and by 1996 aims to have a fully developed cable TV network installed. Hongkong Telecom is running trials of Video-on-Demand. The three new entrants to the telecommunications market - each issued with a FTNS, or Fixed Telephone Network Services, licence - will be adding to

the broadband value-added services available. Wharf's New T&T, in addition to broadband business services, will look towards the interactive home services market services. Hutchison Communications is to build an SDH - Synchronous Digital Hierarchy - network offering high-capacity data transmissions to the business sector suitable for operations such as high-speed file-transfer and video-conferencing, and will explore ways to integrate the mobile services of Hutchison Telecom into the network. New World Telephone have yet to announce specific plans, but besides trying to win a share of international traffic, it seems the strategy will begin by offering a range of personal communications services, such as voice-activated directory inquiries, voice and fax-mail box and secretarial services, based upon state-of-the-art technologies and intelligent networking. (Revenue sources for the new entrants are discussed in more detail in Part Two.)

Hong Kong's information markets are mainly at stages two and three. The service providers fall into three categories: information service providers using either their own networks or leased circuits from Hongkong Telecom; gateway operators offering alternative access to the Hong Kong Telecom International gateway, or direct overseas access through leased circuits; and CUGs, or closed user groups, who operate services over CCTV - Closed Circuit Television - or over LANS or WANS or over leased circuits, and who may also serve members of the public who use their facilities.

¹⁷ C.C.Greenfield and E. Lee 'Government information technology policy in Hong Kong' in J.King ed. *Informatization and the Public Sector: Special Issue* v.2.2 1992 (pp.125-132)

The term CUG originally implied an exclusive principle, but as the technology extends the functionality of electronic systems to the customers of the CUGs, the boundaries of exclusion begin to disappear, and the distinctions between public and private break down. Examples of CUGs include users of proprietary EDI systems, such as shipping companies and some garment suppliers; electronic banking networks, such as SWIFT, the interbank financial network, and the ETM and JETCO ATM networks of Hong Kong banks, as well as CCTV screens providing financial information to customers; CRS - Customer Reservation Systems - operated by travel agencies and airlines, systems such as ABACUS, SABRE and GALLILEO. These CUG information networks have the potential to develop beyond the stage two limitations, to stage three interactive networks. For example, Hexagon, the Hongkong Bank's electronic banking network, which has in excess of 35,000 users,¹⁸ already allows 'home' or 'corporate' banking to take place, and other banks, such as The Standard Chartered, are following suit. In a similar way, CRS systems are extending into the offices of corporate customers who can key-in their travel and reservation requirements. It is already possible to book and pay for cinema reservations by telephone using voice-messaging, and it is only a small technological step to provide online systems which permit 'home shopping' for almost any item.

Gateway operators are service providers who offer access to overseas databases and services on the Internet, including e-mail. Since 1994 the number of Internet gateway licence holders has jumped from three to over twenty.¹⁹ Hongkong Telecom's CSL-

¹⁸ See 'Jumping the Queue' *Banking World Hong Kong*, January 1995, (pp.20-21)

¹⁹ In an incident both farcical and notorious in early 1995 police raided seven of the eight Internet service providers, closing them down and seizing files of customer records. Despite vague references to

Spectrum is the dominant operator, but others, such as AT&T's EasyLink²⁰, Motorola's Mobile Data, and Hutchison Information Services (HIS) offer a range of services, including access to systems such as CompuServe.

The market in Hong Kong for information services is mostly for financial news, currency and stock market price movements. Hong Kong has over one and a half million pager users, many of whom can receive basic price movement information on their display units. The same is true for many of the cellular mobile phone users (see Part Two for numbers.)

But for the more dedicated and professional followers of stocks and financial prices, who range from small local stock broking firms to the dealing rooms of international securities houses and the big banks, the key sources of information come from resalers of Hong Kong Stock Exchange (HKSE) quotations, for local news, and from the international agencies, such as Reuters, Telerate, Bloomberg, Knight-Ridder and Quotron for overseas news. An estimate ²¹ in 1993 concluded there were around 40,000 terminals in Hong Kong receiving HKSE information, being served by companies such as First Electronic, AFE, ABC Communications, Financial Telecom, and numerous others.

investigating possible computer crime - no subsequent charges were brought - apparently the only common factor was the operators were not holding Public Non-Exclusive telecommunications Services (PNETS) licences. The only effect of holding a PNETS licence is, theoretically, to interconnect with HKTC's PSTN at 9 cent per minute. Now Internet services operators do hold PNETS licences, but no interconnect charge is enforced. The future of the PNETS licence is being reviewed.

²⁰ Begun in 1991 as the joint venture Hutchison AT&T Network Services (HANS), in 1994 Hutchison sold their share to AT&T. Hutchison also withdrew from their joint venture with Motorola in Mobile Data. This underscores the lack of a strong commercial market for data services in Hong Kong.

²¹ For an overview of online information services in Hong Kong see J.Ure 'Videotex in Hong Kong' in E.Kuo and K.C.Ho eds. (1995) *Heralding the Information Age: Videotex Development in the Asia-Pacific*. AMIC, Singapore.

These companies segment the market between them, some aiming at professional business users, others at local people who wish to follow the value of their personal savings and investments. Their marketing methods reflect these market segments, some systematically approaching listed companies, others relying upon mass marketing techniques, such as direct mailing, cold calling, and road shows. The marketing efforts are intensive, prices are competitive, and market differentiation through product and service innovation is a continuous process. These efforts are testimony to the vitality of information markets in Hong Kong, but also to the concern that existing markets are reaching saturation levels.

As financial on-line service providers find ways to innovate with multi-media applications continued growth in their markets is likely, and the strong growth in the use of Internet further testifies to the potential demand for on-line information services. But as a commercial application, beyond proprietary systems, it seems that the predominance of small and medium-sized enterprises in the structure of Hong Kong's economy dampens demand. For example, the Hong Kong General Chamber of Commerce abandoned an effort to run an on-line trade information service after a poor response. On-line services have to be paid for, but they so save trips to the library to check through hardcopy information folders. The Trade Development Council efforts to promote a similar service, TDC-Link, is only more successful because it remains for the time being a subsidized service. It has doubled its subscribers in two years, but is still only around the 5,000 mark. The role of the public sector as a means to nurture information services in

their formative years is well established, as the history of Internet illustrates. In Hong Kong the most successful Internet operator so far has been Hong Kong Supernet which is run from The Hong Kong University of Science and Technology, and has branched out into commercial operations. Another example is the Law On-Line Database project of The University of Hong Kong which has also branched into commercial services, offering access to the laws of Hong Kong and China, and related databases.

But what is most likely to radically alter the saturation levels of the future is the advent of a new generation of information technologies which change the way in which people customarily acquire and use information - where the term 'information' itself takes on a wide variety of possible meanings.²² And given Hong Kong's relatively laissez-faire approach to technological innovation, the new information technologies will need a regulatory environment in Hong Kong which allows them to diffuse in the most effective and efficient way. Part Two examines this environment, and its future post-1997.

Part Two: Telecommunications and Hong Kong as an Information Centre

Institutional and Regulatory Structure

²² Contemporary contrived terminologies include 'info-tainment' and 'edu-tainment'.

Development of the telecommunications sector has been governed since 1925 by the Telephone Ordinance which granted monopoly rights to provide solely "public telephonic communications". The other major piece of legislation that rules the provision of telecommunications services is the Telecommunication Ordinance. This regulatory structure catered to the need to regulate the emergence of new modes of communication such as those based on radiocommunication. Market entry is linked to the concession of licenses, which can be granted by the Governor-in-Council or the Telecommunications Authority according to the type of licenses. The former grants special licenses (such as the satellite link license granted to Hutchivision), while the latter deals with more standard licenses (such as those given to cellular operators). Finally, based on the Television Ordinance, the telecommunications regulatory authority also has a say on the technical aspects related to broadcasting.

Until 1993 the main policy and regulatory authority in the telecommunications sector was the Post Master General. Sensitive to the sweeping transformations that the telecommunications sector is undergoing the government decided on the need for a specialist regulatory authority, and for that purpose created the Office of the Telecommunications Authority (OFTA) under a Director-General, who is the TA.²³ The new regulatory body is headed by a Director-General of Telecommunications with considerable regulatory power. The regulatory body is in charge of licensing, financial monitoring and regulation, management and administration of frequency spectrum, the development of technical standards and equipment testing. While the new TA is in

charge of specific regulation, the more general policy guidelines for the sector remained the domain of the Economic Services Branch (ESB).

Besides this important institutional reform the central administration plans a new Telecommunications Ordinance to supercede the two previous ordinances and which, if approved by the Legislative Council, will provide an updated legal basis to current and future transformations in the sector.²⁴

Regulatory Reforms

Basic Wireline Local Services

Around the world basic telecommunications services have traditionally been provided for several decades under monopoly conditions. Only recently basic telecommunications market have started to experience the rise of competition. In most cases competition has been introduced in international services, while local markets have remained shielded from the prospects of competitive entry. But, in Hong Kong the opposite is true. The TA has decided to introduce competition in the local loop by July 1995, while basic voice international services will remain under monopoly conditions until 2006. This seemingly counterintuitive move was inspired by a timing difference in licensing agreements. While the international basic services license (held by Hongkong Telecom International [HKTI])

²³ OFTA has been structured along similar lines as its counterparts in the UK (OfTel) and Australia (Austel).

²⁴ This legislative initiative will be the most important regulatory reform since those, far less radical, carried out in 1983 and 1985.

runs until 2006, the concession for basic local services (held by the Hong Kong Telephone Company [HKTC]) expires on June 30, 1995.²⁵

In early 1992 the government announced its intention to bring competition into the local telecom market. By September of the same year seven companies applied for licenses in an open bidding process.²⁶ Three operators - Hutchison Communications, New T&T Hong Kong, and New World Telephone - were selected for the new FTNS licences to provide services. The presence of new entrants in the local loop by July 1995 brings along a variety of regulatory changes.

On one side, HK Telecom will continue to bear a universal service obligation (USO) and territory wide tariffing. This means that the company will have to provide telecommunications services to all citizen that require a service, even if those new connections are not profitable. Furthermore, the price of services will not be based on the cost of providing them, but on a fixed rate applicable to all Hong Kong residents. Since June 1993 the regulation of telecommunications tariffs in Hong Kong follows a price cap model.

²⁵ Although the domestic monopoly franchise of HKTC is restricted to voice services, the firm has remained the sole provider of basic local network services due to the fact that potential low profits from the resale of fax and data services have discouraged the entry of competitive providers.

²⁶ Seven companies applied for FTNS licences. Although there was no restriction or limits to the percentage of foreign ownership in the business, most companies were formed by a consortium of local and foreign firms. Hutchison Communications had a short-live arrangement with Telstra (now Telecom Australia). Wharf's New T&T Hong Kong has a consultancy association with Nynex, while a shareholder in New World Telephone is the Shanghai Posts and Telecommunications Administration. and US West.

To compensate for this social obligation imposed on HKT, the company will enjoy an Access Deficit Contribution (ADC) consisting of an extra 12% share in the revenues generated by the international traffic to and from HKT customers. Under the new regulatory regime providers of local basic service will receive 28% of all revenues generated by international traffic carried to and from their customers. In the case of HKT, that share is 40%.

Although recent reforms are aimed at achieving a wide liberalization of markets and boosting fair and strong competition among carriers the prospects of a competitive market are not clear. As the experience of the UK and the US have shown promoting competition in telecommunications service markets is not an easy task. For the case of Hong Kong's local market two matters seem to emerge as crucial to the development of a competitive market: interconnection and numbering.

There is a general agreement in the sector that the conditions under which the new operators interconnect to the public switched network (operated by HK Telecom) is crucial to their commercial viability. Beyond this initial common point, the parties diverge on their perceptions of the matter. The TA will provide some guidelines for interconnection, but following similar lines to those adopted by the Federal Communication Commission in the US and Ofcom in the UK encourages the operators to reach interconnection agreements among themselves. The TA will intervene only when one of the parties requests it or when existing agreements among carriers seem to run against the public interest. On the providers side, Hongkong Telecom sees no obstacles

in achieving those goals, since, in their view, the presence of more service providers will increase traffic on the PTSN with the subsequent benefit to the incumbent. The newcomers, instead, forecast a considerable number of obstacles to interconnection agreements and are calling for a more active participation by the TA.

The experience of the UK and the US on interconnection issues points to the fact that the intervention of the regulatory authority is almost inevitable at some point of the process.²⁷ For that reason the TA has retained regulatory powers to enforce the development of a transparent local network. In the government's view this should be an interconnection arrangement in which customers can reach the full range of services available from all companies operating in the market, and not be restricted to those offered by the carrier from which the customer rents the exchange line connection.

Numbering policy is another factor of capital importance in the new competitive environment. There are two different kinds of number portability: geographical portability (when the subscriber moves to a different location and retains the previous telephone number) and operator portability (when the number is held despite changing operators). Number portability has direct benefits to users. It avoids the problems and

²⁷ On issues of interconnection in the UK see Director General of Telecommunications, *Interconnection and Accounting Separation: The Next Steps*, Report by the Office of Telecommunications, London, UK. For the US experience, see Smith, D.G. and D.C.Pitt 'Open Network Architecture: Journey to an Unknown Destination.' in *Telecommunications Policy* (October 1991): 379-394. See also, Walker, Dawson and Jonathon Solomon, 'The Interconnection Imperative', *Telecommunications Policy* (May-June 1993): 257-280.

costs generated by changing numbers, i.e. having to inform all correspondents of change, advertising the new number, changing printed material, and the risk of losing contact with a considerable number of current and potential correspondents. In a more indirect way, numbering policies are particularly important to the development of a balanced and fair competitive environment. Recent studies on number portability in Hong Kong, for example, have shown that 68% of the subscribers who would consider switching to a new operator if they could retain their telephone number, would not switch if they have to change it. This implies that without number portability the chances for the new competing operators to attract new customers are slim. Aware of the implication of numbering in a competitive local loop, the TA has announced plans for the introduction of geographical and number portability without technological specifications²⁸ by July 1995, when the market is open to competition.²⁹

The evolution of interconnection and number portability issues will very much determine the viability of telecommunications service competition in the local market. This in turn will affect the variety and quality of services available to the business community in Hong Kong, but does not mean that a non-competitive environment necessarily results in poor services. The high quality, wide variety, and low pricing of services in non-

²⁸ At the present there are two possible technical solutions to number portability: call forwarding and intelligent network (IN). The former is the most cost-effective and easiest to install but it is quite inefficient in the use of network resources. The latter, instead, provides an efficient use of networks but its cost is much higher and its implementation will take at least another two years, which is too late for the start of local competition. For that reason in the short run call forwarding will be adopted and progressively, at it becomes more cost effective and feasible, the solution will migrate to an IN configuration.

²⁹ OFTA has requested a consultant to carry on a study on number portability in Hong Kong. For more details, see Ovum Ltd. 1993.

competitive markets such as Hong Kong and Singapore (as compared to other developed markets in the world) speak against that assumption. But, as scores of studies around the world have shown, there is no doubt that competition provides considerable incentives to improve quality, variety, and pricing of telecommunications services.³⁰

International Services

In international telecommunications services the current and short term scenario is quite different from that of local services. Hong Kong Telecom International (HKTI) holds an exclusive license until the year 2006. However, a variety of legal and economic factors have lead to increasing pressures to shrink the scope of the exclusivity.

There are two main interrelated factors that are driving these pressures. One is the booming international telecommunications traffic in the Territory which has raised pressure from large users aiming for lower tariffs and from potential service providers aiming at market entry. Rapid economic development in the region, and in particular in China, has lead to an even higher demand for international services. It has been estimated that the growth rate in international telecommunications traffic will remain at approximately 19% in the coming years.³¹

³⁰ See, for example, OECD, *Telecommunications Infrastructure: The Benefits of Competition*, Paris: OECD, 1995.

³¹ See Kong Kong Telecom *Annual Report*, 1994.

The other factor is the loose terminology of the concession. The license, which was granted in 1981, lacks precision in its language and does not include a variety of recent developments in the market that could not have been anticipated at that time. These factors have induced challenges from potential competitors and the intervention of the TA to clarify the terms of the license. Based on the current government's drive to increase competition in the market it can be expected that the license will be interpreted in ways that will enhance the likelihood of liberalization without violating the terms of the license or undermining its spirit.³² An example of this will be callback, which has been ruled legal in Hong Kong. The new FTNS licensees will use this mechanism as a way to reverse outgoing calls so they become incoming calls from which they gain a higher revenue share from HKTI under the revenue-sharing arrangements agreed by OFTA. The same applies to mobile cellular telephone service operators who interconnect directly with the HKTI gateway.

Initial steps in this progressive path towards a more liberalized and competitive international market can be singled out in the official decision to allow multinational corporations (MNCs) operating in Hong Kong to implement what is has been called "self provision" of international telecommunications services. Based on this regulation MNCs will be able to set up their own international circuits.³³ The decision, which is legalizing

³² The British administration considers that undermining the terms of the licence will set an undesirable precedent that can be used by the Chinese authorities after 1997 to dismantle preexisting contracts, licensees, and other legal bodies.

³³ The policy also grants companies direct access to Intelsat. In the past all agreements with the international satellite body had to be processed by the UK Signatory Affairs Office. Some of these policies

the bypass of HKTI for large users, has the limitation that international links should be restricted only to intra-corporate traffic. However, in practice it will be very difficult or impossible to control the final destination of the call. Once a call from Hong Kong reaches one of the overseas branches of the company it can be easily re-routed to its final destination through domestic or international public networks. Besides concrete reforms such as the permission for "self provision", the government is considering further changes, which might include, for example, the widening of the opportunities for resale.³⁴

Mobile Services

Hong Kong is one of the most developed and sophisticated mobile communications markets in the world. In fact, Hong Kong has the third highest penetration of mobile services in the world after Scandinavian countries and the USA. (See **Fig. # 2001**). The market is served by four public mobile radiotelephone service (PMRS) operators, four licensed telepoint (CT-2) operators - although only three operate - and more than 32 radio paging operators. As of September 1994, there were 392,251 PMRS subscribers, 171,715

reflect the effort of the current British administration to shift, prior to 1997, from government to private sector control over important matters.

³⁴ The efforts to keep Hong Kong as an attractive business center have affected not only structural aspects of the sector, but also contingent ones, such as the level of tariffs of international direct dialing (IDD). HKTI has been asked to apply a nominal reduction of its IDD rates between 1994 and 1997. The company was obliged to cut its tariffs by 8% from August 1993 and by 2% in August 1994 and 1995. Tariffs for international calls to China, however, remained unchanged, presumably due to the growing negative balance in the international accounting rates that HKTI has with the mainland.

CT2 subscribers, and more than 1.32 million people using paging services (see **Fig. # 1009**).³⁵ (*see also .. Telecom Nov. 94*)

Despite this impressive market profile, the government considered that the full benefits of competition have not been enjoyed by consumers due to constraints in spectrum and network capacity. With the aim of improving competition dynamics, the government decided to issue in 1995 up to 6 Personal Communications Services (PCS) and up to 4 Cordless Access Services (CAS) licenses.³⁶ The new services will operate between the 1.7 and 2.0 GHz bands, in a segment of the spectrum that the government has recently cleared for advanced mobile services. Providers will be selected in an open bidding process, in which existing fixed network, mobile cellular, telepoint, paging service providers, manufacturers and potential new operators are allowed to bid for either or both services.³⁷ The government is considering to grant more licenses to serve in the 1.9 - 2.2 GHz band by 1997/98.

The issue of technical standards is important to all telecommunications facilities, but it is particularly crucial to competitiveness of mobile systems. In Hong Kong the existing companies have adopted several of the dominant standards in the world (see **Fig.**

³⁵ Of the 392,251 PMRS subscribers, 147,232 were carrying digital units, while 245,019 were using analog systems. The mobile market also provided services to 84,399 private mobile radio stations. For more detail information, see Office of the Telecommunications Authority 1994.

³⁶ PCS are under OFTAs definition "the category of services most closely related to the European personal communications network, or personal communications services in the USA. CAS are for the regulatory authority "low mobility cordless services which primarily provide public services for access to fixed telecommunications networks. Functionally they can be considered to be similar to CT2 telepoint services but may have additional features and capabilities, e.g. the ability to receive calls, low-speed mobility with call hand-off between cells." Arena 1994.

³⁷ Unrestricted open bidding is the outcome of a public review process carried out by OFTA in which the industry and the public's view on the reform were brought into the design of the new policy. In an earlier

1009). Yet, mobile technologies are in a permanent state of flux and there are a considerable number of potential standard configurations being considered for the near future.³⁸ Considering that the most likely trend is the continued coexistence of various competing technologies, rather than the convergence of all of them into a single platform, the TA has opted for a "technology-neutral" licensing strategy. This new approach will overcome the restrictions currently imposed by current Public Radiocommunications Service Licenses (PRSL)--which require services to be provided under specified technologies-- and allow licensees to adopt any mobile technology they consider appropriate to provide services in the assigned frequency bands.³⁹

Another innovative policy that concerns mobile operators, is that they are allowed to have their own fixed networks to interconnect switching centers and other operations. However, they are not allowed for the time being to compete with fixed network operators in the provision of services to the customer. Most new mobile technologies are fit to interconnect with fixed networks. This fact has challenged preestablished regulatory separations between the two segments of the market. Although there is no technical impediment to allow carriers in both fixed and mobile systems to compete with

draft of the policy the existing PMRS operators were given priority to take four of the new six licences and only the remaining two would be subject to open bidding.

³⁸ Some of them are, for example, Digital European Cordless Telecommunications (DECT), Personal Communications Networks (PCNs), Future Public Land Mobile Telecommunications Services (FPLMTS), Universal Mobile Telecommunications Services (UMTS), and Mobile Satellite Services (MSS).

³⁹ The exception to this policy is that new licensees are constrained by a policy of "no looking back", which intends to exclude them from adopting technologies that, by operating in the 800/900 MHz bands, allow them to compete with existing mobile carriers. Current providers are being encouraged to change their current licenses to the new technology-neutral ones.

each other, the TA have decided to keep them separate until new carriers in the fixed network have consolidated their position in the market (i.e., at least until 1998).

This impressive explosion of mobile telecommunications services in Hong Kong is an encouraging development for the Territory's role as an information hub. As the world moves rapidly to embrace mobile communications system (see **Figure # 1005**), Hong Kong's early entry and extensive diffusion in the use of this technology should grant it a competitive advantage in attracting global businesses.

The Prospects of Competition

Recent policies point to the building of intensive competition in the local market while leveraging a more liberal environment in international communication services. Yet, gaining a considerable share of the market will not be an easy task for the new entrants. Hongkong Telecom has a well established position in the market. More than 88% of the households in the Territory are already served by HK Telecom, and the ones that are not are not an attractive business for the new entrants. Although there are some niches in which a late comer can provide a competitive advantage over the incumbent, in most of the market HK Telecom has established a lead that will be difficult to topple. Some

companies in other countries, for example, have gained a share of the market by providing advanced networks such as full digitalization and broadband fiber optic lines. In Hong Kong, the incumbent has already reached full digitalization and most of its networks are fiber based. Similar patterns can be found in other aspects of the service, such as tariffs, reliability and quality of services, as well as diversity. A recent study has estimated that in the short run new entrants will be able to capture only 3% of the market.⁴⁰

Although this may sound like a not very attractive business venture, there are some conditions unique to Hong Kong that allows even a small share of the market to provide the basis for the new entrants to survive and grow. First, Hong Kong is a "vertical city" with high urban concentration, providing unique conditions for reduced costs and high revenues in networked industries such as telecom. Second, a large number of multinational corporations' regional headquarters are located in Hong Kong. More than 70% of all major American multinationals operating in the Asia-Pacific region have their headquarters in Hong Kong. Due to the need of regional coordination, headquarters are heavy users of international telecommunications services.

It is in the migration of some of these large business customers to the new carriers where the survival and development of competition lies. Large businesses are heavy users of two of the most attractive services in the market: value-added and international services.

⁴⁰ Lee, Paul S., 'Hong Kong as a Communications Hub: Is Deregulation Enough?' Telecommunications Policy (September-October 1993): 475-480.

Based on 1993-94 figures, it has been estimated, for example, that if one of the future providers captured 1% of the value added services market they would have generated US\$ 1.94 million in revenues annually.⁴¹ Yet, the most interesting source of income for the new companies is derived not so much from VAS, but from the their delivery fee of international services. Competing carriers will receive 12% of the revenues generated by the traffic that is initiated or terminated by one of its subscribers. Based on current traffic, delivery fees for 1% of the incoming and outgoing traffic stream should generate approximately US\$ 3.5 million in revenues annually. The new companies, not having a universal service obligation, will target large corporate users which provide the bulk of the telecom traffic. Attracting a few users responsible for at least 3% of international traffic should raise the annual revenues of new entrants to US\$ 10.51 million. This assessment is compatible with the view of some of the top executives of the new companies who estimate that a 2% share of the market would be enough for the company to grow at a reasonable pace in the coming years.

Furthermore, if interconnection and numbering portability do not generate significant costs, large business users--who generate the bulk of the revenues in the market--might want to distribute their connection to gain bargaining power, to diversify their traffic for security reasons, and to experiment with the alternative pricing and networking arrangement that the new companies will offer.

⁴¹ Revenue estimates of this paragraph are provided by Mueller, Milton. "How to Establish Market Share in a Competitive Environment." Paper presented at IIR Conference on "Hong Kong Telecommunications and Network Competition". Hong Kong. 28 September 1994.

The TA is mindful that despite the implementation of tuned policies to stimulate competition there is always a chance that licensees collude and cartelize rather than compete. For that reason, the government has reserved for itself the right to introduce new competitors in the market if it considers that the goals of liberalization have not been achieved. However, in a effort to avoid market dynamics that might hinder the growth and consolidation of the three new entrants the TA will not grant any other license for the local market until 1997.

Hong Kong as a Business Information Hub in Asia

Hong Kong has become in recent years an important regional information and telecommunications hub. There are two factors that have particularly worked in favor of such a role. First, Hong Kong has a long history as a transportation and communication center in the Asia-Pacific region. This well-established reputation as a convergence point for trade and business in the Asia provided the basis upon which the currently sophisticated communication facilities progressively built on.⁴² Second, thanks to the long closure of China to the outside world, Hong Kong played during past decades a key role as an intermediary between the mainland and the world. Although the first factor will probably keep enhancing Hong Kong's entrepot role in the region, the second one looks less promising in the mid- to long-term future.

The role of Hong Kong as a information/communication business hub is clearly reflected in the growth of its international telecommunications traffic, and in particular with China. In 1994 Hong Kong was the recipient of 50% of China's outgoing traffic, while at the same time the Mainland accounted for 50% of Hong Kong's outgoing calls.⁴³ This boost in China's traffic has been largely grounded in China's economic boom and in particular in the southeastern province of Guangdong. Telecommunications traffic to Guangdong, for example, accounts for 80% of traffic to China.

However, it is this same Chinese economic prosperity that might undermine Hong Kong's leading role as an Asian information and communication hub. Economic growth in Southeastern China has triggered a very rapid network and service development. Guangdong province, for example, had in 1995 a network as extensive as Hong Kong's and growing at double digits annually.

The communication power that southern provinces have gained in recent years is, however, the product not so much of local capabilities but of Beijing's decision to use the south as a laboratory for market reforms. Following this strategy the central Chinese government invested in large resources in, and gave considerable attention to the south. In

⁴² The fact that the other major telecommunications hub in the region is Singapore, which has also been the other major transportation hub in Asia, highlights the role of preexisting infrastructure in boosting modern ones.

⁴³ This reflects a trend that developed rapidly after 1986. In that year China accounted for only 18% of Hong Kong's international traffic, in 1991 its participation had grown to 36%, and it was estimated that by 1995 China and Taiwan alone would account for more than half of HKTII traffic.

a centrally controlled economy it would be very difficult for Guangdong to have developed its telecommunications network at the pace it has done without the full support of the central government. Recently, however, the attention of Beijing has shifted away from Guangdong to focus on strengthening Shanghai's infrastructure.⁴⁴ This political move from the central government may weaken Hong Kong's position in regard to regional business flows.

Besides current competition from the mainland, the political consequences of 1997 hang over Hong Kong like a gloomy shadow. Most businesses have started to set jurisdictions for legal problems outside of Hong Kong if the contract runs over the 1997 threshold. This fact reflects the uncertainty and distrust of the business community over the fate of Hong Kong's legal and institutional guarantees. And even if businesses do not relocate their regional headquarters they will probably take precautions to protect sensitive data by moving their databases abroad. This in some ways would hinder Hong Kong's role as a regional information hub. But, one might also argue that if headquarters remain in the territory while their information centres are placed overseas, telecommunications traffic to and from the Territory will keep growing which should sustain Hong Kong's infrastructural communication capabilities.

At first glance, the prospects of Hong Kong as a regional hub for information flows seems not to be very promising. Yet, a closer look unveils possible trends that might continue to support Hong Kong's traditional hubbing role. From the perspective of users

⁴⁴ Sizngwei, Wang 'Shanghai Unveils Plan to Lead Asia Within the Next 15 Years' Eastern express, 25

of telecommunications services, the value of a communication business hub is based not so much on network penetration - as it has been argued for the case of Guangdong - but on expertise, knowledge, and quality in network and service management. In all of these factors Hong Kong's long-term development of the telecommunications service industry has a clear competitive advantage over new comers. Further, widespread liberalization of the local market has produced - and will keep producing - a large number of service providers which offer an appealing variety of sophisticated telecommunications and information services at competitive prices. In China, on the contrary, the need to keep sector development under control to fulfill a variety of social goals has undermined, and will probably continue to do so in the near future, the cost and variety of services provided. It might take China's strongest business centres, such as Shanghai and Guangdong, a long time to build the required infrastructure, knowledge and services expertise to become business information hubs. However, at the current rate of business and technological transformation is hard to tell if hubbing or some kind of distributed federation of networks would be the predominant mode of communication infrastructure by then.⁴⁵

Hong Kong's telecommunication future also depends on the evolving relation between the Territory and the Mainland and the place granted to telecommunications services between the two in the aftermath of 1997. Based on agreements between the Chinese and

February 1994, p.23

⁴⁵ See John Ure, 'Hong Kong and China: Telecommunications After 1997' paper delivered at the IIR *Conference on Hong Kong Telecommunications and Network Competition*, Hong Kong 28-30 September 1994; also John Ure 'Telecommunications' in *From Colony to SAR* eds. Joseph Cheng and Sammy Lo, Chinese University Press, Hong Kong (1995 forthcoming)

the British government that renders Hong Kong as a Special Administrative Region (SAR) telecommunications traffic from Hong Kong after 1977 will be still considered as international. If that is the case, central authorities in Beijing will probably have significant incentives to boost Hong Kong as a telecommunication gateway to China, mainly due to the significant benefits in foreign exchange and revenues that the Chinese government, through the Ministry of Posts and Telecommunications (MPT), gains from international accounting settlements. Low tariffs in Hong Kong and high ones in China, along with rapid network expansion in the Mainland has led to an important rise in outbound traffic from Hong Kong to China, with a subsequent favorable balance for the latter in the settlement of accounting rates between the two countries.

From the Chinese government's point of view, there is also an interest to protect the growth of telecommunications business in Hong Kong. The central administration has, through its foreign investment institution - CITIC - an 18.5 % share of Hong Kong's Telecom. Although in the short run, this financial interests in Hong Kong's telecom services might induce the Chinese government to promote Hong Kong's telecom traffic, this does not seem to be a long term development in the relation between the two sides. According to global trends in accounting settlements the current imbalance produced by high tariffs in some countries will probably not remain for long. China, as many other countries around the world, is coming under strong international pressure to reduce its international tariffs, and it is quite likely that these pressures will succeed sometime in the near future, reducing, for the MPT the current attractiveness of Hong Kong's telecommunications traffic as a source of revenues.

Finally, from a broader socio-political and economic perspective, Beijing is undoubtedly more interested in keeping Hong Kong under control than making a relatively small profit out of international telecommunications traffic.

Conclusion

Hong Kong has already taken significant steps towards the restructuring of its telecommunications service market. But, the current policy reforms begin an experiment with levels of market competition not yet seen anywhere else in the world. These bold policy moves reflect the publicly stated goal of the Hong Kong government: "to achieve in the most economically efficient manner the provision of the widest range of quality telecommunications services available to the community at reasonable cost". Behind these policy initiatives is the vision that Hong Kong should remain as "the preeminent communications hub for the region now and into the next century".

In terms of quality and cost Hong Kong's future as the major hub of the region looks well founded, but there are weaknesses. Chief among these is Hong Kong's dependence upon a relatively narrow range of key service industries which rely heavily upon excellent communications but which could migrate to other centres within the regions. The predominance of small and medium-sized enterprises in Hong Kong's economy provides the Territory with a highly flexible and adaptable industrial structure, but one which does not generate a high level of demand for the sophisticated end of telecommunications services, and therefore does little to accelerate Hong Kong into the high-value end of

economic activity. On the other hand, it is an industrial and social structure which adopts and adapts mobile and personal communications services with great invention, and in that sense Hong Kong remains one of the, if not the, most dynamic telecommunications market in the world.