TELECOMMUNICATIONS: HONG KONG AND THE SAR

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In the world of modern digital telecommunications, high speeds of exchange switching and transmission along bundles of hair-thick optical fibres, and the compression of microwave signals from base-stations and satellites, have replaced thick cables and wide spectrums of high-frequency radio-waves. This is important because it drives up the volumes of traffic the network can carry, and drives down the unit costs, and sometimes the absolute costs, of carrying it.

At the heart of these changes to the economics of telecommunications lies the revolution in micro-electronics, which has done much more than reduce the real cost of networks. It has added intelligence to the network. Initially the intelligence was software built into the switch as firmware, but today the intelligence can be located at any nodal point in a network, including at the end-user terminal, such as a PC or telephone handset. The potential of this is to transform networks into as many sub-nets as there are terminals, and the commercial system of telecommunications operators into a set of sub-sets, each catering to its own particular market segment. This, it must be stressed, is the potential, more realizable in some markets than in others, but the trends are already well apparent world wide as the traditional monopolies of public utility operators give way to market competition, to public network by-pass, and to self-provisioning among different categories of users.[1]

[1] The most comprehensive, and readable, mapping of these changes is to be found in P.W.Huber, *The Geodesic Network: 1987 Report on Competition in the Telephone Industry* (Washington, D.C.: US Department of Justice, Antitrust Division, 1987), and its sequel, P.W.Huber, M.K.Kellog and J.Thorne*, The Geodesic Network ll: 1993 Report on Competition in the Telephone Industry* (Washington, D.C.: The Geodesic Company, 1994).

Hong Kong Telecommunications in Transition

Hong Kong took its first steps into this brave new world of telecommunications in the 1980s when customer premises equipment, or CPE, paging services and then mobile cellular telephone services were opened to market competition. Downlinking from satellites directly into customer premises, and uplinking to satellites by broadcasters such as Star TV, were also liberalized, having previously been treated as part of the exclusive privilege of HongKong Telecom International. Lobbying for these changes from important commercial interests, including the Hong Kong Telecommunications Users Group, was effective, but this lobbying was given greater poignancy by the fact that Hong Kong is in competition with Singapore to be the region's leading telecommunications hub. Hubbing refers to the use of the territory by overseas organizations as a node to originate, terminate and process voice and data traffic, and through which to transit traffic to other parts of the region. The same consideration in 1995 is allowing international companies based in Hong Kong to use satellite uplinking and downlinking to self-provide their own telecommunications traffic, a by-pass of the public network.[2]

All these steps are but a transition stage. On 1 July 1995 the monopoly of the Hong Kong Telephone Company, or HKTC, over the basic voice public switched telephone network, PSTN, is replaced by an open market, limited only by the number of new fixed-line telephone network (FLTN) licences the regulator, the Director-General of OFTA (Office of the Telecommunications Authority) is prepared to issue. Currently, and in addition to HKTC, that number is three: Hutchison Communication, Wharf Holding's New T&T Hong Kong, and New World Telephone. But even this step is but one beyond the transition. The technologies driving the potential of telecommunications are reconstructing the relationship between fixed-wire and wireless systems.

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[2] See *Position Paper: Hong Kong's Telecommunications Policy* (Hong Kong Government: Economic Services Branch, Government Secretariat, January 1994) for the broad outlines of policy.

Although radio was originally conceived by Marconi as a method of communicating between moving ships to immobile land sites, in past decades radio was used for connecting fixed sites over long-distances of land or sea, while wirelines were put in place locally to serve people moving between sites, each site having its own wireline. Today the vision is swinging back to Marconi's view. Personal communications systems PCS, the next wireless generation of telephones, are designed to assign telephone numbers to people rather than places. Personal communication networks, or PCN, a variant of PCS, are designed partly to complement the existing embedded fixed-wire networks, but also partly to substitute for them. The existing generation of digital cellular telephones, and their analogue forerunners, were most definitely designed as complements, although in countries such as China where there is a desperate shortage of a PSTN, they do become substitutes by default. However, cellular phones require to interconnect with the PSTN to carry calls to and from the network, but the PCS and PCN operators in Hong Kong will be given the right to construct their own cable network backbones.

This underscores the point that in the local loop, previously the domain of the wireline, wireless communications will edge their way in. Technologies such as cordless telephones (CT1 for the home, CT2 for the street) are transforming into more sophisticated office networks, such as DECT (the digital european cordless telephone) which replaces the fixed-line PABX (private automatic branch exchange, or office switchboard) serving an office with radio communications inside the building and between the building and the local exchange or PSTN. The distinction between a fixed wireline operator and a wireless operator will cease to be meaningful as the operators of each will need to offer the services of the other. In Hong Kong, OFTA has already stated its intention to abolish the licensing distinction, probably by the end of the decade. Only then will Hong Kong have truly made the transition to the new era of telecommunications.

Hong Kong's Telecommunications and China

SDH, or synchronous digital hierarchy, is a technology for high speed transmission of data. Data includes everything that can be translated into binary coding, and that includes voice, sound and image. Speed, or b/s (bits per second) is equivalent to traffic volume. In November 1994 China's first SDH network was opened linking Guangzhou - Dougguan - Huizhou - Shenzhen to Hong Kong, with a speed of 2.488 Gb/s. This link supplements an analogue microwave system and two existing optical fibre cables, and instantly upped the equivalent number of voice circuits between Hong Kong and Southern China from 12,480 to 22,290.

China's rate of telecommunications development is substantial, close to 20 per cent annual growth in exchange capacity; unfortunately only 60 per cent of that capacity is connected up to subscribers, a problem typical of low-income developing countries. By late 1994 China was reporting an exchange capacity of 48 million circuits, but there were under two subscribers per 100 inhabitants.[3] The national target for 2000 is 140 million circuits exchange capacity, of which 114 million will be provided by the Provincial Telecommunication Administrations, or PTAs, which come under the Ministry of Posts and Telecommunications, or MPT. The remaining circuits are those anticipated by the MPT to be provided by other organizations, including the two new entrants given authority by the State Council in 1993 and 1994, the JiTong Corporation and the LianTong (or Unicom - United Communications) Corporation. Teledensity is planned to reach between 30 - 40 mainlines per 100 inhabitants in the major cities, and 6 - 8 per 100 countrywide.

[3] By contrast Hong Kong has 3 million telephone mainlines, or 50 for every 100 inhabitants, the highest percentage, or 'teledensity', in Asia outside Japan. Of these, 1.8 million were residential lines catering for 1.6 million households, around 90 per cent of which have telephones, an average of 1.3 lines per household. As a saturation level this sounds rather high, suggesting maybe half-a-million or so business lines are registered as residential to avoid higher monthly rentals.

In addition, China is building out long-distance optical fibre trunk lines between all major cities, an extensive network of satellites and earth stations to provide nationwide telecommunications and television coverage, microwave coverage for trunking across less populated areas, high-speed digital data networks for the cities and a medium-speed communications network for national data links.[4] Inevitably, these developments are uneven between the thrusting economies of the coastal provinces in the south and east, and the poorer central and western areas. This shows up most starkly in the figures for cellular mobile phones. By the end of 1994 there were probably not less than 1 million in use in China, 500,000 of them in Guangdong province, which in November 1994 also pioneered China's digital GSM (Group Speciale Mobile) system. Roaming between Hong Kong and Guangdong using the analogue TACS (Total Access Communications System) system can now be extended to GSM. Roaming is also extensive between the two territories using pagers.

1994 also saw Guangdong's network exchange capacity overhaul Hong Kong's, but again the connection rate, even in Shenzhen on Hong Kong's border, is less than 60 per cent. Network congestion in Guangdong, as elsewhere in China, reduces the successful call ratio (SCR) to below 60 per cent, and during busy hour often to below 30 per cent. Nevertheless a direct beneficiary of China's network development has been HongKong Telecom International, or HKTI. China traffic now accounts for 50 per cent of HKTI's IDD traffic volume and over 30 per cent of IDD revenues. The next closest is US traffic which accounts for 11 per cent of IDD revenue. Over recent years China - Hong Kong traffic has been growing at an annual rate of around 30 per cent, although the rate fell during 1994, apparently due to the austerity measures introduced by the Chinese government to curb credit and price inflation. About 80 per cent of this traffic is between Hong Kong and China's southern province of Guangdong, with most of it terminating in Shenzhen.

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[4] For details of China's telecommunications policies and development, see the China Special Issue of *Telecommunications Policy*, (London: Butterworth-Heinemann) 18.3 (April 1994). For China and Hong Kong also see J.Ure (ed.) *Telecommunications in Asia: Policy, Planning and Development* (Hong Kong: Hong Kong University Press, 1995).

The rapid changes taking place in the telecommunications sector in China and Hong Kong in many ways complement each other. For example, in both cases policy towards monopoly and competition has shifted decisively in favour of the latter. However, for China telecommunications remains an issue hovering between being a security concern on the one hand, that is as a source of state information and control, and on the other being an industry which is simultaneously an essential infrastructure, a dynamic source of economic growth in its own right, and a catalyst for other information technology sectors, from computers and databases to information services to cable TV and videotex services. For the average Chinese citizen a telephone remains a much sought after item, while a personal computer or facsimile machine remains beyond reach. By contrast, for Hong Kong citizens, telecommunications customer facilities and services have become less utility items and more like commodities sold in supermarkets, available at affordable prices to whoever wants them.

China still prohibits any foreign direct investment in public or private telecommunication network management, but encourages foreign funding of network construction, and at least at provincial level seems flexible about the financial arrangements to repay the foreign partner. Especially in the area of mobile cellular telephone, paging and trunk radio networks, numerous Hong Kong and other Asian-based companies have entered agreements to build local networks, supply equipment such as base stations and handsets, and offer consultancy services covering items such as network management, customer billing, maintenance and repair.

These deals are arranged with organizations in China which have access to radio spectrum and a potential customer base. For example, a state enterprise, such as a steel mill or large manufacturing plant, may employ thousands of workers who are potential customers of a private paging network, while a port authority or a local public security bureau responsible for emergency services will require extensive trunk radio systems. The PLA (Peoples' Liberation Army) is another major operator of mobile radio services with

radio spectrum available to it, and Hong Kong-based companies, such as Champion Technologies, ABC Communications and Star Paging, and equipment suppliers such as S. Megga, and Tricom and others, have entered a number of supplier contracts.

The financial arrangements vary according to circumstances, but may involve a joint-venture or joint agreement to finance, supply and build the network while the Chinese-side partner is the network operator. Rates of return, paid out of network revenues, can be structured in a variety of ways. If the non-Chinese partner is committed for the long-term they can be designed to increase the value of the network, or they can be designed to produce 'equity-like returns'.[5] (These can be upwards of fifty per cent for new ventures in telecommunications). Alternatively, or additionally, they can be designed to accumulate in value until such time as the law permits them to be converted into equity. Another way, which is now used extensively by local Chinese investors, for example state enterprises with access to cash, is the leaseback arrangement, whereby the private investor purchases equipment, such as a switch, and leases it to the network operator, usually a provincial telecommunications authority, or PTA. At the lease-end the ownership of the equipment transfers to the PTA.

Hong Kong companies directly benefit from the massive expansion of telecommunications networks in China. The Hong Kong Telecom Association (HKTA), which represents most of the Territory's telecommunications equipment manufacturers and equipment suppliers, lists over 60 members in its *1993 Official Guide to Telecommunications in Hong Kong.* Exports of telecommunications equipment, parts and accessories from Hong Kong rose from HK$3,900 million in 1983 to HK$12,095 million in 1993, but of this rise the proportion going to China rose from HK$705 million (18 per

[5] Following an announcement earlier in the year between Cable and Wireless and China's MPT to form a submarine cable-laying joint venture, in November 1994 HongKong Telecom announced two contracts, one with the MPT and the other with the Beijing PTA, to help finance and build an optical fibre cable link between Beijing and Shenzhen, and a GSM cellular system in China's capital city. The financial arrangements of the latter have been described as involving 'equity-like returns'. See *Asia-Pacific Telecommunications - An Industry in Transition* (Hong Kong: Salomon Brothers, December 1994) p.20.

cent) to HK$9,601 million (79 per cent). Re-exports of the same rose from HK$872 million in 1983 to HK$34,088 million in 1993, with the proportion destined for China rising from HK$14 million (1.6 per cent) to HK$16,606 million (49 per cent).

Hong Kong has not developed a telecommunications manufacturing base to the same extent as other Little Dragon economies, notably South Korea and Taiwan, but the 1992 Survey of Industrial Production[6] lists 157 establishments in Hong Kong as manufacturing radio, television and communications equipment and apparatus, employing 7,361 persons and with annual gross sales of nearly HK$9 billion. Most of the actual manufacturing takes place in China, while Hong Kong specializes in management, research and design, principally for niche markets, such as Chinese-character set alpha-numeric pagers, network connector devices, switchboards, terminal equipment, and so on. Hong Kong operators also specialize in service innovations, such as financial information, secretarial and messaging services, and transactions technologies which are well adapted to the changing business and social requirements of Chinese customers. For an economy like Hong Kong's, which relies upon high adaptability to rapidly changing world and regional market conditions, a vibrant telecommunications equipment supply sector has a significant role to play in the Territory's future prosperity.

Hong Kong as Telecommunications Hub

The dragon that Hong Kong is in fiery competition with is Singapore, and this is one of the drivers of Hong Kong's policies towards telecommunications and related information services, such as broadcasting. The regional competitive advantages which good telecommunications bring Hong Kong cut both ways. Without effective and efficient telecommunications Hong Kong would soon lose its position as a financial and banking centre, and as a hub for regional headquarters and offices of international companies. These are vital to Hong Kong's open economy. But modern telecommunications facilities - high-speed digital exchanges for the integration of data, image and voice switching, and

[6] See *Annual Digest of Statistics* (Hong Kong: Census and Statistics Department, 1994)

high-speed transmission routes over satellite and through optical fibre submarine cables - also allow multinational corporations to shift many of their business functions, such as data processing, customer accounts, design, boardroom meetings, and so on, away from any particular location, especially one considered to be unstable or politically high-risk.

Without an open telecommunications environment Hong Kong would soon lose its position as a financial and banking centre, and as a hub for regional headquarters and offices of international companies. In the past this was not necessarily so. A monopoly carrier was able to provide, in Hong Kong and Singapore alike, a reliable, high-quality service at regionally competitive tariffs. Today the technology offers major corporate users opportunities to by-pass the public networks, and would-be service providers an increasing number of opportunities to provide innovative services, ranging from alternative carriage to network management and integration of corporate customers computer networks to wireless services and highly specialized niche market services. International companies are requiring more because although their unit telecommunications costs are falling their total volume usage of telecommunications is rising. In part this is a function of their greater reliance upon computer-generated data, in part an elastic substitution effect of falling relative costs of telecommunications,[7] and in part a function of the locational division of business functions within the multi-national corporation.[8]

[7] For example, video-conferencing is cheaper than flying staff around the world to a central location. Sending product designs and orders by EDI (electronic data interchange) is faster and cheaper than by a courier service, as E-mail is faster and cheaper than post, fax and possibly a phone call.

[8] An absorbing review of the locational aspects of the information economy is found in M. Castells *The Informational City* (Oxford, UK and Cambridge, USA: Blackwell, 1989). A model of the information economy, which relates an increasing demand for electronic communications to an increasing world division of internal corporate labour, and the consequential requirements for commercial and industrial co-ordination, is discussed by L.Gille "Growth and Telecommunications" in *Information, Telecommunications and Development* (Geneva: International Telecommunications Union, 1986).

These international companies, and their hubbing activities, are vital to Hong Kong's open economy. According to an Industry Department survey[9] there are more than 7,000 overseas companies in Hong Kong, and during the three consecutive five year periods since 1980 the average annual number of regional headquarters being set up in Hong Kong rose from 20 to 44 to 53. The two primary reasons for choosing Hong Kong were given by respondents as the banking and financial facilities (94.6 per cent) and infrastructure (91.9 per cent). The survey - 2,993 questionnaires were returned - revealed nearly 2,000 regional operations run from Hong Kong, including over 700 regional headquarters. According to HongKong Telecom, over 450 international companies use Hong Kong to hub their regional telecommunications traffic, and at least 50 of these have regional headquarters in the territory. Petrazzini [10] adds that approximately 70 per cent of US firms with Asian headquarters centralize their operations in Hong Kong.

Hong Kong's Telecommunications Policy

For seventy years Hong Kong's domestic fixed-wire PSTN has been run by the Hong Kong Telephone Company, or HKTC, as a private, but regulated, monopoly. Since 1984 HKTC has been a subsidiary of the British company Cable and Wireless plc., which also owns HongKong Telecom International, or HKTI. Both have become subsidiaries of the holding company, HongKong Telecom Ltd, or HKT, along with HKTC's subsidiary CSL which provides competitive services, such as mobile telephones, pagers and data services. The ground for shifting from HKTC's monopoly to competition was prepared by replacing rate of return regulation, which traded-off profit stability for higher prices, with price-cap regulation which trades-off price stability for higher profits.[11] The former

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[9] Industry Department. *Report on the 1994 Survey of Regional Representation by Overseas Companies in Hong Kong*. (Hong Kong: Hong Kong Government, 1994).
[10] B.Petrazzini. "Hong Kong's Telecom Market" *Transnational Data and Communications Report* (Washington D.C.) July-August 1994.
[11] The distinction between a profits-cap and a price-cap is not quite so clear cut. In setting the price-cap the regulator is required to take a view of likely future productivity gains, and in this way indirectly imposes a profits-cap. For a discussion of the issues, see

system worked well because rapid technological change in basic network infrastructure rapidly reduced costs, so higher nominal prices still meant lower real prices. Since many of those technological gains have now been realized, the latter system only works well if other cost-cutting measures are effected.

Hence HKT is under constant pressure to reduce staff and other costs, or spread them across new business areas.[12] HKT has adopted both approaches, including forming a joint venture (Great Eastern Telecommunications Ltd) with its parent company to explore regional investment opportunities, with China at the top of the agenda.[13] The 1994 appointment of Linus Cheung as Chief Executive Officer of HongKong Telecom was widely seen as significant in this regard. Not only is he the first Chinese to hold the top position, but coming from Cathay Pacific he is the first top executive to be appointed from outside the group, and indeed outside the industry. This 'localization' is a significant shift for a company that traditionally has been run by British engineers or accountants.

Under the rate-of-return regime HongKong Telecom was required to separately account for its franchised PSTN (HKTC), its exclusively licensed international (HKTI) and its competitive (CSL) services, but from 1995 HKT will strive to integrate HKTC and CSL as far as possible to reduce duplicated costs and maximize business synergies. This is likely to bring HKT into conflict with OFTA and the new entrants. OFTA will be on the look-out for predatory pricing and hidden cross-subsidies, while the new entrants will complain that HKT's competitive business units unfairly have exclusive knowledge of customer records and of the network. Since the establishment of OFTA in July 1993, the Director-General in his role (under the Telecommunications Ordinance) as the Telecommunications Authority, or TA, has stressed a pro-competitive policy

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M.Beesley and S.Littlechild "The Regulation of Privatized Monopolies in the UK" in *Rand Journal of Economics* (Santa Monica) 20:3 (1988).

[12] Maintaining HKT's contribution to its parent company, Cable and Wireless, may be considered a further pressure. Between two-thirds and three-quarters of the group's world earnings and profits derive from HongKong Telecom.

commitment. The most contentious issue at stake is the future of HKTI's exclusive international licence.[14]

Ahead of schedule, the licence was renewed by the Hong Kong Government in 1981 for twenty-five years as a gift to Mrs Thatcher and her Conservative government in Britain, at a time when her government had chosen Cable and Wireless to be the first state-enterprise to be privatized. However, technology has moved so far since then that most new services, such as private satellite transmissions, and high-speed digital data circuits, have easily been interpreted to fall beyond the scope of the licence. Since 1991 Hong Kong has progressively liberalized the IVANS (international value-added network services) market, and by the end of 1994 thirty licences to operate IVANS had been issued. Much now turns on the interpretation of the licence to determine how far the remaining exclusively applies to 'basic' services and network 'facilities.' For example, OFTA has interpreted store-and-forward fax as non-basic, and is extending this to store-and-forward voice. Another example involves foreign-based companies with voice-messaging and switching facilities in Hong Kong, who are being allowed to operate a free 800 number service to North America from where they reroute international calls to the country of destination, in effect by-passing HKTI's outbound network. (HKTI continues to receive the incoming accounting rate settlement payments where callback is involved, but fail to collect the local IDD charges.)

OFTA is proving effective both in continuing the policy, adopted in the days when the TA was the Postmaster General, of opening up the radio communications markets, that is cellular mobile telephony, CT2 and paging, as far as the market will bear, and in preparing the ground for the day when the distinctions between wire and wireless in Hong Kong will become meaningless. That is, for the day when the choice of technologies will

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[13] See footnote 11 above.

[14] For the text of the licence, together with a critical review of the monopoly, see M.Mueller *International Telecommunications in Hong Kong: The Case for Liberalization* (Hong Kong: The Chinese University Press/Hong Kong Centre for Economic Research, 1992)

be determined by user requirements rather than operator preferences. But related issues, such as the technology convergence between telecommunications, computer networking and television networking, are less clear cut from a regulatory point of view.

Telecommunications comes under the Economic Services Branch (ESB) of the Government - to whom OFTA reports - but broadcasting and narrowcasting falls under the Recreation and Culture Branch (RCB), while content comes under the aegis of the Television and Entertainment Licensing Authority (TELA). Issues such as pornography and defamation over networked computers is governed by the general laws of the territory, as would similar material on a CD-ROM and on a video, unless it were screened for public broadcast. But how to treat Video-on-Demand (VOD) over a telephone line? Since HKT is making trials of VOD, Wharf Cable, which holds the territory's cable TV franchise on an exclusive basis until October 1996**,** wants VOD to be constrained by the exclusivity period and subject to the same oversight restrictions as its own programme content. But if VOD is deemed to be a telecommunications service, exclusivity does not apply. OFTA and the RCB seem to have different views on this matter. Further, since VOD would be available on a point-to-point rather than a point-to-multipoint basis, it could be treated more in the category of a video rented from a shop than as a video broadcast, and thereby not be subject to the same content oversight by TELA.

These types of issues can only proliferate as multi-media applications come along, but fundamental to these changes is the restructuring of the telecommunications industry. Hong Kong is leaving an era which stretched from the late 1960s to the early 1990s, during which universal service on demand was accomplished, and the network fully digitalized. This success does not just place Hong Kong at the forefront of Asian networks, it also offers opportunities for market entry which previously did not exist.

Market entry depends critically upon one of two conditions. Either a new entrant can provide a service, or a bundle of services, on a stand-lone basis more efficiently than the incumbent operator, or regulation guarantees an economic rate of return on investment for

the new entrant. The traditional competitive advantages of the incumbent operator arise from economies of scale and of scope. The former spread overheads, such as administration costs, depreciation, and building and maintenance costs, over the entire embedded network and its customers, something a new entrant serving only a fraction of the market cannot match. The latter spread the costs of the network over a wider range of products and services. Ironically, digitalization has increased the range of such services which an incumbent can offer, [15] and in that sense has strengthened the hand of the incumbent operator.

From the customer's viewpoint, being on a large rather than a small network offers economies of scale in terms of calls that can be made and received, and being on a digitalized network offers scale economies in terms of getting many additional services, such as teleshopping, call forwarding, and so on,[16] for zero or low incremental cost. But if a customer is to have choice - and without choice a customer has no market power to express preferences - new entrants require the right to interconnect their small networks and limited services to customers over the incumbent's network. The rationale for doing so does not lie in a 'right of choice' as such, but in the premise that there may be selected areas of service, made possible by the technological revolution in micro-electronics, and made realizable through the inventive activities of entrepreneurs, which can be more efficiently (lower cost) or more productively (quality of service) offered by new entrants than by the incumbent. The underlying challenge is the question: why should the incumbent be best at everything? Of course, the underlying answer is: if the incumbent is best at everything, then monopoly is natural.

It is the undermining of the idea that telecommunications is a natural monopoly that lies at the heart of the radical policy changes which have swept through telecommunications

[15] Digitalization reduces all telecommunications traffic, be it sound or image, to 'data' in binary notation, and thereby allows, with the right switching, transmission and terminal equipment, sound and image to be combined in all sorts of ways, opening up a potential for a multitude of multi-media products and services.

authorities the world over. However it is not a foregone argument. There remain substantial reasons for viewing many elements of long-distance telecommunications which use optical fibre cables for high-speed transmission of data and high-volumes of voice traffic as close to natural monopolies.[17] But the point is mute for Hong Kong which is too small to have any long-distance traffic. The real question for Hong Kong is whether it is too small to sustain any effective competition in telecommunications. We return to this question below. (NB. not a question of too many mobile operators, but a question of insufficient spectrum. Markets sort out the number of operators.) (Numbering Plan. Interconnection. Revenue-sharing).

Hong Kong and China After 1997[18]

How things may work out after 1997 can only be speculation, but it is possible to identify issues which are likely to be influential. It needs to be stressed that if the authorities in a small city-state like Hong Kong have had difficulties in coming to grips with the implications of the technological and commercial transformation of the industry, the Chinese authorities have even greater problems. Generally, they are less exposed to the knowledge and experience of the leading OECD economies, and so lack many of the human resources required to initiate and see through policy and regulatory changes. Issues like state enterprise reform and the introduction of modern methods of cost-accounting, business planning, pricing policy and market research, are in their infancy. In addition, China has to tackle simultaneously the basic problems of low levels of

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[16] For example, booking cinema tickets, paying utility bills, checking airline timetables, polling information over the facsimile machine.

[17] For example, Huber (op.cit., 1993) argues that in the USA only excessively favourable terms of revenue-sharing, insisted upon by the Federal Communications Commission (FCC) keep MCI and US Sprint as long-distance competitors to AT&T. For an incumbent operator ineffective competition is better than both effective competition and none. "AT&T is now buying protection." (p.1.13).

[18] The following section is based on a paper "Hong Kong and China: Telecommunications After 1997" delivered to the IIR Hong Kong Telecommunications and Network Competition Conference, Furama Hotel, Hong Kong 28-30 September 1994.

development and achieving universal service, and the challenge of upgrading its leading trade, manufacturing and service centres to meet world-class standards.

It follows, therefore, that China has more to learn from Hong Kong than Hong Kong does from China in the area of telecommunications. How China transfers that knowledge from Hong Kong will be one of the most interesting questions after 1997. It need not be a zero-sum game, but there is a fear that it could become so. To consider the alternatives, it will help to sketch out three possible scenarios, and consider the implications and likelihood of each.

Scenario One: Nothing changes. OFTA remains the regulator under the SAR, the industry continues to be governed by the Telephone and Telecommunications Ordinances, the three new fixed-wireline licenses come into operation, as do all the other licenses OFTA may consider approving in areas such as radio mobile communications and value-added networks and network services. Company ownerships remain unchanged and the status of Hong Kong as an independent telecommunications authority in world fora continues.

Scenario Two: Everything changes. China, through the Joint Liaison Group or JLG, refuses to recognize new fixed-wireline licenses, and the MPT, with State Council approval, declares that basic services must be a state monopoly, or may be provided only by Chinese-designated companies, and uses CITIC as a vehicle to make Cable & Wireless plc an offer for HongKong Telecom it cannot refuse. The regulation of the international telecommunication networks and services effectively passes into the hands of a Hong Kong office of the MPT.

Scenario Three: Some things change, most importantly the status of traffic between Hong Kong and China, along with two-way investment between the SAR of Hong Kong and other provinces of China, especially Guangdong province. In particular, the Guangdong Bureau of Posts and Telecommunications seeks to build upon the economic integration of Hong Kong and Guangdong province by breaking down the regulatory barriers between

the two territories. In the much longer term this could lead to either a ‘free trade telecoms area’ (the benign option) or a Guangdong takeover of Hong Kong’s telecommunications riches. Looked at from another perspective, it could mean Guangdong promoting its provincial interests in relation to Hong Kong to the detriment of the influence of the MPT in Beijing.

Scenario One

On the assumption that 1997 brings no appreciable changes to telecommunications policy, or the way it is administered, we can say that Hong Kong will remain a separately administered telecoms authority, and pending agreement with the Chinese-side on the JLG, the FLTN licenses proposed for Hutchison, New World and Wharf will go ahead. OFTA has introduced a fresh and welcome degree of transparency into policy discussion through the issuing of thoughtful and well presented discussion papers which have sought, and received, public comment, and has established an advisory/consultative committee structure which has been widely welcomed by the industry, and could well be taken as a lesson for other parts of Government in Hong Kong. If this process of a more open society survives and continues beyond 1997 then Hong Kong can become an experimental base for the information society from which China herself can learn many valuable lessons. This is clearly the ideal relationship: Hong Kong as a mirror in which China can reflect on how to do things successfully in the field of information technology and tele-communications.

Of course Hong Kong has been playing this role in various ways since China adopted her Open Door Policy. Hong Kong has been, and continues to be, China’s international telecommunications gateway, as the earlier discussion of traffic volumes illustrated. Co-operation between Hong Kong and the rest of China is clearly mutually beneficial, such as the agreement between HongKong Telecom and the MPT to provide one-stop shopping for leased circuits between the two territories. Hong Kong remains the region’s leading communications hub, spurred on by keen competition from Singapore, and despite uncertainties about 1997, it seems that Hong Kong is the preferred base for

RHQs, other things being equal. But uncertainty about continuity and stability has undoubtedly led to contingency planning by international companies, and the removal of business operations, such as sensitive databanks, to overseas locations is likely.

Some have already been moved. This, of course, is made possible by Hong Kong's international telecoms facilities, and will actually add to traffic flow, which highlights an important point. Unlike other industries which relocate to the loss of the economy they are leaving, telecommunications-related activities network across economic locations and enhance their competitive advantages. These wide-area locational economies will play an increasingly important role in Asia, and here lies the key to Hong Kong's future involvement with the regional economies of China.

But the model relationship is not a straight-forward 'integrationalist' one where Hong Kong and Shenzhen merge rapidly into a single economic unit and Hong Kong becomes more like Southern China as Southern China becomes more like Hong Kong, the two meeting somewhere in the middle. On the contrary, Hong Kong's competitive advantage, to itself and to the rest of China, lies precisely in the fact that it is not like Southern China and that it straddles two very different economic realms, the realm of a reformist China which is looking outwards to a world market in which it is still very poorly equipped to compete, and the realm of advanced post-industrial economies which are looking for risk-reduced entry into the China market.

So, under the first scenario, Hong Kong is seen expanding its own internal telecom markets for mobile and personal communications, for inter-active home services such as Video-On-Demand and Cable TV combined with telephony, and business value-added networks being spurred by competition from both domestic new entrants and growing pressure from the world alliances of international telecommunications carriers which are now forming to capture international corporate business.

In relations with the mainland, the driver will remain the rate of network growth in China, which is obviously long-term related to China's economic development. As both Chinese and foreign companies multiply, and their business grows, the demand for data communications and network information services as well as basic services will begin to take off, but the larger the plane the longer the runway, so it will take time. The danger of foreshortening development forecasts could yet lead to some very unwise investments. The really significant development within this scenario is the possibility of policy changes in China towards foreign direct investment (FDI) in the ownership and management of networks and network services.[19]

What is the likelihood of scenario one? On paper it is by far the most likely, but like most issues concerned with the transfer of sovereignty in 1997 there is uncertainty attached to it. One danger is that many items of business that need to be sorted out through the JLG before 1997 will be left hanging in the air, and then the rules of the game could become very flexible. Of course, flexibility is not always a bad thing, especially if reflects the underlying transformations in technologies, market situations, world trading agreements, and crucially the shifting balance of interests between stakeholders, who we may identify as including users in different segments of the market, the carriers and their stakeholders, the public interest in having an information economy and information society, the regulator and the state. It is to be hoped that regulatory flexibility after 1997 will continue to be the result of good judgment exercised by an independent regulator.

Scenario Two

The second scenario need not be presented in Machiavellian terms. Rather it can be approached from looking at the issue from the Chinese side, and making an argument

[19] Elsewhere I have argued that China has ways of funding its telecommunications expansion plans which do not hinge upon FDI, but much more depend upon human resources and technology transfer issues. See J.Ure (ed.) *Telecommnications in Asia: Policy, Planning and Development* (Hong Kong: Hong Kong University Press, 1995). Also J. Ure "Breaking the Bottleneck in Telecom Nets" in the *South China Business Post*, 6 October 1994.

along the following lines: the interpretation of One Country, Two Systems is well understood in general terms, such as leaving property rights as a system unchanged, but in working it out in practice there have to be some guiding principles. The first principle should be Hong Kong's contribution to the PRC, not Hong Kong in isolation. So detailed interventions in the economic and industrial structure can be justified so long as the essentially capitalist nature of Hong Kong is maintained. By 'capitalist' I understand this to mean, in the Hong Kong context, a system of property rights rather than the role of markets. In this respect it is interesting to note in passing that one of the structures underpinning the success of Hong Kong is a quasi-socialist state (or Crown) ownership of land. Landlease sales finance social expenditure while keeping down personal and company taxation. The Chinese would not be hard-pressed to come up with arguments for other forms of intervention which nevertheless maintained the essential structure of property rights.

One speculation, and it has no more status than that, has been that the State Council will use CITIC to takeover HongKong Telecom, perhaps offering Cable & Wireless minority shareholder status to pay lip-service to property rights, and will protect the monopoly rent for Telecom by refusing to agree to, or revoking, new FLTN licences. This would not be feasible in the mobile communications market since existing players clearly have entrenched property rights, but the issuing of future licenses could, of course, be restricted either to Telecom or to other Chinese companies considered suitable.

In a word, this scenario is improbable. First, it goes against China's own internal development. The State Council has come out in favour of what we might term 'controlled competition' for telecommunications networks in China. It has backed the creation of the MEI's (Ministry of Electronics) JiTong Corporation for the construction of nationwide information networks, the so-called Golden Projects, and it has given approval for the creation of the LianTong Corporation (Unicom) to run long-distance, local loop and cellular networks.

Second, China has clearly recognized at the highest levels that its need for an efficient information economy requires, as a matter of urgency, the widest possible mobilization of funds for network construction. We noted earlier the SDH development in Guangdong, which is to be replicated in other leading provinces and municipal cities. Guangdong is also pioneering an ATM (Asynchronous Transfer Mode) high-speed data switch for broadband services, such as cable TV and video-conferencing, in a particularly interesting joint venture with an American consortium, SCM/Brooks, which is putting up the finance and apparently is to have some involvement in the operation of the project once its working. The MPT, having opened the packet-switched Chinapac network is now undertaking a national digital data network. The State Planning Commission and the State Information Centre are planning a national satellite-based information network, and so on. The emphasis is upon diversity, to attract funding, and flexibility with regard provincial initiatives, but within a framework which maintains Chinese control.

So the proposition that China, or the MPT, will swoop into Hong Kong on 1st July 1997 to 'takeover' the telecommunications industry seems inconsistent with the direction of China's policy on the mainland. Of course, Hong Kong will be exceptional in having foreign-owned companies running the networks, but that is part of the One Country, Two Systems concept, and is not incompatible with China's needs. It is also important to distinguish between the ministerial interests of the MPT and the political and macro-economic interests of the State Council. The MPT has to balance the revenues it currently enjoys from Hong Kong traffic to the mainland, with the damage that would be done to Hong Kong as a hub should a takeover occur. The State Council has an interest in keeping Hong Kong as a spur to the diffusion of information technology on the mainland. Only if political interests are directly affected would the State Council adopt a different attitude.

Finally, on the role of CITIC as a stalking horse for a China takeover, of course anything is possible, but is it probable? CITIC has invested heavily in infrastructure in Hong Kong, which is a strategic investment both from the financial point of view (its all blue-chip)

and from an economic point of view since there are obvious synergies with China trade. But CITIC is not an entrepreneurial company.[20] It has stuck to investments, and even reduced its holdings of HongKong Telecom stock from 20 per cent to 14.5 per cent in January 1994 when profit-taking looked like a smart option. With China looking to become a member of the World Trade Organization, it would hardly seem beneficial to China to provoke a trade-in-services issue in such a strategic world industry.

Scenario Three

In this scenario, the Guangdong Bureau of Posts & Telecoms leverages the Guangdong Provincial Government into embracing Hong Kong's lucrative telecommunications market. Traffic between Hong Kong and Guangdong is redefined as either intra-provincial long distance, or failing that, inter-provincial trunk. Either way tariffs fall,[21] which is politically very popular, and Guangdong and not the MPT in Beijing receive the revenue of incoming traffic, which is politically even more popular with local government. Furthermore, mobile roaming becomes automatic, and to ease the commercial arrangements the GBPT buys heavily into HongKong Telecom, or alternatively into a competitor, and possibly offers HongKong Telecom, or a competitor, or both, a quid pro quo in Guangdong. (For GBPT we could just as easily substitute one or two other organizations, such as a business arm of the PLA or the Ministry of Electronic Industries.)

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[20] According to Minister Wang of the State Enterprise and Trade Commission, after state enterprise reform: "State investment bodies will enjoy only the rights of shareholders and will not perform administrative functions." *China Daily* 20 December 1994, p.4 (quoting an article in the State Council's *Economic Daily*)

[21] International tariffs in part reflect to accounting rate system used between international administrations to compensate each other for the termination of calls. The accounting rate establishes a per minute charge, for example US$1, and the settlement rate determines the split between administrations, usually 50:50, for example US50 cents per minute for a delivered call. If traffic volumes (incoming and outgoing) between two administrations exactly balance, then their payments cancel out. The telephone company charges its customer a collection rate (the IDD tariff) for making the call, which normally covers the net settlement cost for traffic on that particular route. If Hong Kong - China traffic were not treated as international, the accounting rate system would no longer apply, and IDD

This is the start of a transition period in which the regulatory barriers to cross-border traffic dissolve. The HongKong Telecom International License is allowed to run its course to 2006, but is undermined by the redefinition of China traffic as non-international. The impact upon HKTI's revenue growth could be more than offset by a strategy of acquisition of mainland operators under relaxed foreign investment laws which permit minority holdings and joint-ventures, starting with value-added networks and radio communications systems covering mobile cellular, vsats and radio local loop. In the horse-trading and maneuvering implied by this scenario, the regional hubbing business of HongKong Telecom remains its strong card for China, and the new SAR Chief Executive is therefore likely to provide vigorous support for Hong Kong interests, demanding reciprocity for any redefinitions of traffic and services.

This scenario is almost inevitable somewhere down the tract because as the level and quality of the Guangdong network improves, the demands by similar customers for the same level of provision at the same level of prices will become irresistible. By-pass in one form or another will force these changes, and maintaining separate regulatory regimes will become an anachronism. So the time factor is one dimension. The pace of development will be uneven across Guangdong, but the leading areas will drive the issue, so the other dimension is the geography of development. The closer to Hong Kong, for example along the Pearl River Delta, the faster will come the transition.

But the idea that Guangdong will rapidly overtake Hong Kong as the hub for Southern China, with the implication that Guangdong will suck the life out of Hong Kong's telecoms industry, does not ring true. Hubbing requires a level of quality and reliability of service and human resources, not just technology, that goes beyond network numbers. There is no reason why Guangdong should not achieve the required levels in, perhaps, fifteen-twenty years, but by then who knows by how much the information economy will

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rates could reflect that accordingly. But since the settlement rate is 33.3:66.7 in China's favour, the MPT would be reluctant to give it up.

have become a more distributed network of networks? Will this still leave a role for regional hubbing? Perhaps not.

The Future of Telecommunications in Hong Kong

The trends in telecommunication technologies and patterns of network evolution Asia will follow tomorrow are to found in the USA today. This is not to say what works in America will be simply transplanted to Asia. On the contrary, the nature of local and regional markets in Asia are diverse and different from those of North America. For instance, ideogrammatic scripts like Chinese and Japanese present many problems for the standardization of computer software, and therefore for the use of E-mail and EDI (electronic data interchange), but are easily handled by 'scribble-and-send' methods, such as facsimile and palm-top electronic organizers. But the underlying economic realities will be much the same across the global market-place.

Intelligent nodes and terminals and distributed computing power will create opportunities for business and social users alike to create their own virtual networks, and the costs of doing so will encourage increasing levels of by-pass of more expensive systems. The critical issues will pass from the direct regulation of prices and profits to policing a regime of open access networks which allows users, and operators, to plug into any public network, be it telecommunications, cable TV, Internet, or whatever, and pay a price which is non-discriminatory between the user and what the service providers charge themselves. On this basis market entry will become increasingly common, opening up a host of specialist information and communications services.

Of particular importance will be the size and scope of China's information requirements in the years to come, and Hong Kong is uniquely well-positioned both to serve the China market directly and to act as an information gateway between China and the rest of the world. As a gateway, Hong Kong can provide a secure, efficient and cost-effective hub for data-storage, retrieval and processing and for information relay. As a regional centre

of international companies, and as a base for an increasing number of influential Asian service companies, Hong Kong also has the prospect of developing further its acquired advantages in activities which increasingly use electronic communications: such as banking and financial services; management, business and property services; research and design; software production and distribution; education and health technologies; entertainment and information services; and so on. But underpinning all these technologically-based advantages is the human resource advantage that Hong Kong has acquired for itself: knowing how to apply and manage these technologies in the marketplace, and for social benefit. There will be no shortage of opportunity in China for Hong Kong's skills. This is the potential, but the time-frame for its realization depends upon how economic relations between Hong Kong and the mainland develop post-1997.

In the immediate future Hong Kong must position itself by encouraging the transition it has embarked upon in telecommunications. In practice this means (i) regulating the terms and conditions for the new fixed wireline entrants, and (ii) preparing the ground for abolishing the wireline-wireless distinction. OFTA has already defined the terms of entry for the new FLTN licencees by taking direct control of the numbering plan and by introducing new rules governing revenue-sharing for the origination and termination of international calls by both the new FLTN licence holders and the cellular mobile telephone operators. Guaranteeing equal access by all telephone service operators to numbers for their subscribers is a basic condition for fair competition, otherwise inertia and/or inconvenience would deter many existing subscribers from changing their service provider. Yet to come is a satisfactory means of administering and paying for a network numbering system which can provide personal numbering, as opposed to terminal (mobile) or locational (immobile) numbering, which is also portable across competing networks. As a first step, each FLTN licensed operator will be able to offer personal numbering as a value-added service across their own network.

The revenue-sharing arrangements between new FLTN operators, mobile cellular operators, and HongKong Telecom International could prove to be a contentious area,

especially if the new entrants find it difficult to win market share from HKT. Current arrangements provide for operators terminating incoming calls from HKTI to receive HS$0.62 for calls from Guangdong Province, Shenzhen and Macau, and HS$12.12 for calls from the rest of the world. For outgoing IDD calls delivered to HKTI, service operators will be able to claim a weighted average of 8.19 per cent of HKTI's IDD call charge. But these operators will receive less than the share HKTC receives from HKTI, the difference being a subsidy towards HKTC's universal service obligation. According to OFTA[22] in 1991/2 this was the equivalent of 45 cents per minute of international traffic, or almost HK$1.2 billion. Calculating this figure pre-supposes a number of accounting assumptions regarding the allocation of costs between services, and if more public light can be brought to bear upon the true costs of providing social obligations this will be important information for services providers, customers, regulators, legislators and public bodies such as the Consumer Council when decisions have to be made about the future rebalancing of tariffs between local and long-distance international calls, and between so-called basic and value-added services.

In a digital world, the distinction between basic and value added services only exists as a regulatory fiction for protecting the monopoly of the PSTN operator. Hong Kong has moved beyond that stage, but the immediate challenge for the new entrants will be to make a market for their services, whether defined as basic voice or value-added. The representative company in Hong Kong is not the multinational corporation with its sophisticated telecommunications requirements, but a small or medium-sized enterprise, or SME, employing less than 200 staff, usually less than 50, frequently less than 10. These companies have a high rate of attrition, are especially vulnerable to trade fluctuations, and frequently move premises due to the two-year cycle of rent-fixing in Hong Kong. SME's survive on their adaptability, which involves minimizing their fixed, and sunk, capital commitments. They provide a thriving market for mobile

[22] *Guidance Note for the Submission of Proposals for the Operation of Fixed Telecommunication Network Services in Hong Kong* (Hong Kong: Office of the Telecommunications Authority, 1993) Annex C, p.1.

telecommunications, a potential market for portable office automation, and a limited market for information and data services provided over networked PCs.

In this respect, two challenges face Hong Kong. First, the introduction of a territory-wide EDI network for trading companies seeking documentation from government departments. Progress in Hong Kong seems painfully slow, yet EDI could be a powerful catalyst for the spread of an electronic communications culture among Hong Kong's smaller businesses. The other side of this coin is the role of government, which also seems to be painfully slow in adopting information technology to go on-line with the public. Looking ahead, there is no reason why, for example, the post office should not introduce an EDI system of its own to replace paper and envelops and time-wasting queues at its offices. The spread of electronic mailboxes should be only a matter of years away.

The second challenge is that of so-called multi-media products and services. In the USA the Information SuperHighway is projected as the universal network to bring broadband services, such as video-on-demand, tele-conferencing, and many others, to everyone's home or office. For the foreseeable future Hong Kong will develop these services slowly due both to the lack of an adequate universal broadband infrastructure, and to a limited market. The markets will emerge as the information society emerges, which implies cultural and social changes. The information society will emerge as service providers experiment with alternative technologies and information services. Hong Kong's challenge, therefore, will be to complete the transition to a telecommunity in which equal access to public networks is universal, thereby encouraging experimentation by innovators. World-wide, these development are irreversible, and if the post-1997 era for Hong Kong and China also permits this development, then times will indeed be interesting.

Keywords

Hong Kong
China
JiTong Corporation
Lian Tong (Unicom)
PLA
PSTN - public switched telephone network
By-pass
Self-provisioning
Cellular mobile telephone
Roaming
CT1
CT2
Paging
DECT
PABX

Marconi
GSM
satellite
Star TV
Hutchison
Wharf
New World
HongKong Telecom
Hong Kong Telephone Company
HongKong Telecom International
CSL
Cable and Wireless
Champion Technologies
ABC Communications
Star Paging
Tricom
S.A.Megga
SCM/Brooks
Guangdong
Shenzhen
Ministry of Posts and Telecommunications
FLTN
Hubbing
Singapore
OFTA
Economic Services Branch
Recreation and Culture Branch
TELA
Cable TV
Video on Demand
IDD
Accounting rate
Settlement rate
Price cap
Profits cap
Regulation
Mrs Thatcher
Basic services
Value-added services
IVANS - international value added services
SDH
ATM
CITIC
JLG
FDI

One Country, Two Systems
Property rights
State Planning Commission
State Information Centre
State Council
World Trade Organization
Revenue-sharing

Biography

John Ure is the Director of the Telecommunications Research Project at the Centre of Asian Studies, University of Hong Kong. His first degree in economics came from the University of Hull, in the North of England, and his masters in economics from Birkbeck College, University of London. His doctorate, from the East London Polytechnic, was a study of technological change and the economics of the public switched telephone network in Hong Kong. Since 1989 John Ure has been based at the Centre of Asian Studies. His telecommunications publications include "Telecommunications, With Chinese Characteristics" in the China Special issue of *Telecommunications Policy*, April 1994; Ure (ed.) *Telecommunications in Asia: Policy, Planning and Development*, Hong Kong University Press, 1995; "Options and Opportunities in China's Telecommunications." in Lee (ed.) *Telecommunications and Development in China*, Hampton Press, 1995; and "Videotex and Information Services in Hong Kong" in Kuo and Ho (eds.) *Heralding the Information Age: Videotex Development in the Asia-Pacific* Singapore: AMIC, 1995.