

Hong Kong 2000 - A New Era For Telecoms  
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Background Briefing Paper  
Inaugural Quarterly  
Telecommunications InfoTechnology Forum (TIF)  
1st April 1998, The Convention Centre, Hong Kong

**Introduction:** The following summarizes 2 papers. The first, for Hong Kong Committee for Pacific Economic Co-operation (HKCPEC) in 1997 (the full version can be found [www.trp.hku.hk](http://www.trp.hku.hk)). The second is a draft for this meeting.

**PSTN Tariffs Reductions**

(a) customer benefits from recurrent PSTN tariff reductions (rentals and value-added services; *there are no local call charges in Hong Kong*) have been estimated since 1995 - estimated savings are around HK\$10 million.

(b) the imputed value of the increased quality and scope of services available at standard tariffs or in bundled discounted packages is HK\$2.5 million.

(c) savings on IDD tariffs owing to callback, which is used by *all four* FTNS operators are estimated at around HK\$1,230 million.

(d) it is estimated that total savings attributable to the business sector come to HK\$800 million, or 5.3% of business telecoms expenditures, estimated as HK\$15 billion.

**Telecoms Investment**

(a) It is estimated that the accelerated or additional investment stimulated by PSTN liberalization is approximately HK\$4.2 billion, or 0.35 per cent of GDP.

(b) It is estimated that the domestic multiplier effects of investment anticipated over five years due to liberalization, in today's money, is around HK\$9.58 billion, or 0.8 per cent of GDP.

(c) Therefore the multiplier effects of current plus anticipated investment over the next five years due to liberalization, in today's money, is estimated equivalent to over 1.15 per cent of GDP.

**Cellular Mobile** (a) It is estimated that the overall saving to consumers from falling handset prices, monthly rentals and airtime charges is in the order of HK\$6.63 billion.

## Conclusion

1. PSTN liberalization has benefitted consumers directly to the tune of HK\$1.24 billion (US\$159 million).
2. PSTN liberalization has stimulated investment which will add approximately 1.15 per cent in today's money to GDP growth over the next five years.
3. Accelerated competition between cellular operators due to the further opening of the market since 1995-96 has benefitted consumers by HK\$6.63 billion (US\$0.8 billion).

### Summary 2:

## A Competitive Price for Telecoms Services?

The weighted average IDD call charge in 1995 was around HK\$6.7 per minute. According to FCC data, the real component cost of those IDD calls was close to HK\$0.61 per minute. At an estimated average international-carrier accounting settlement rate of HK\$4.5 per minute (and assuming a price elasticity of -0.3) the price which would have equated total revenue to total cost (including a 15 per cent rate of return on capital) in 1995 was HK\$2.88, but revenues would have fallen by 50 per cent (to around HK\$6 billion).

Had the accounting rate system been by-passed by ISVR, and the access fee been set at the ISP PNETS charge, the 'equilibrium' price (equating total revenue to total cost) would have been HK\$1.01, and revenues down to HK\$2.2 billion.

Economics dictates that FTNS operators cannot make a business from these figures, yet WTO and other considerations dictate that Hong Kong cannot afford to close its markets. Can arrangements be found which strike a workable balance?

The domestic market also looks bleak for new FTNS operators, at least in the short term. But is there a role for Government in stimulating both the supply and demand sides for advanced telecommunications and inter-active new media services by promoting community IT applications?

Finally, what is the role of the regulator in this new era? The concept of 'public interest' is increasingly taking the shape of 'consumer protection', so has the time come for a fair trading policy?

- Paper follows -

# A Competitive Price for Telecoms Services?

John Ure<sup>1</sup>

Background Briefing Paper

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The current pricing structure of telecommunications services is widely described by regulators and economists as distorted, by which is meant that in some sense the pricing structure is not efficient. This begs the question ‘what is efficiency?’ The standard response of an economist will be ‘an efficient price is one that reflects the true costs of its provision, including the competitive return on capital.’ Without going into a long dissertation, this answer is by definition correct in a static context, but maybe irrelevant in a dynamic one.

Even in the static world there are problems. For example, indivisibilities such as overheads and managerial expenses can only be allocated between services on an arbitrary basis. For example, Hongkong Telecom’s total network costs are allocated roughly 7 per cent to international services and 93 per cent to domestic services according to traffic volumes. This is convenient, but arbitrary. For example, why not allocate according to the value of the calls being made rather than their duration? One effect of such a change would be to reduce the estimated subsidy which transfers from international to local. (Of course, without call-charging it is difficult to know what value to place on local calls.)

In a dynamic world technologies are fast changing, and new services are being promoted. It is perfectly good business practice to cross-subsidize new services until they gain a footing or until they prove a failure. (This is not the same as predatory pricing, which is to use financial muscle to deliberately price below cost to drive out competitors.)

With these reservations in mind, the following is an exercise in estimating what a competitive IDD call charge would have been in 1995 when the weighted-average call charge was about \$6.70.<sup>2</sup> Table 1 shows that HKT received a gross revenue from

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<sup>2</sup> Estimated in J. Ure ‘Telecommunications’ in Cheung Y.L. and M.H.Sze eds. *The Other Hong Kong Report 1995*. Hong Kong: The Chinese University Press (pp.380-401).

international traffic of \$16.3 billion, that is before payouts to overseas administrations through accounting rate settlement charges. Outgoing traffic was 1,578 million minutes, so IDD revenue collection was around \$10.6 billion. The difference of \$5.7 billion was mostly incoming accounting rate settlements and other income, for example IPLC revenue.

Table 1

Financial Year	International Turnover	IDD Collection Revenues	Other Revenues
1994-95	\$16,310.5 m	\$10,575.4 m	\$5,735.1 m

We want to simulate what the Hong Kong world will look like after January 1998 when most callback traffic will be displaced by ISR.<sup>3</sup> According to industry estimates, 15 per cent of traffic was callback by 1995, so if we want to isolate a competitive IDD price without callback we can reallocate traffic such that outgoing would rise to 1,794 million minutes and incoming fall from 1,446 million minutes to 1,230 million minutes. On this basis IDD collection charges at \$6.70 per minute would have been \$12 billion, but accounting rate settlements from incoming traffic would have been correspondingly less. (Probably a little over \$0.8 billion less on the assumptions below).

How do we determine what the competitive weighted average price would have been in 1995? The Federal Communications Commission (FCC) has its own estimates (attached as Appendix D)<sup>4</sup>. Hong Kong's international transmission cost component is estimated to be US5.1 cents per minute, international switching cost US1.9 cents per minute and the national extension component rounded to zero. We shall replace the zero with the PNETS charge of US0.8 cents per minute.<sup>5</sup> So the FCC's total cost component estimate for Hong Kong is US7.8 cents per minute, or HK61 cents. If we follow the terminology of the Australian Industry Commission<sup>6</sup> and call this the *resource*

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<sup>3</sup> Often referred to as International Simple Voice Resale, which specifies that ISR is otherwise available for non-real time voice services.

<sup>4</sup> I use these estimates simply because no others are available. This does not imply that they should not be questioned.

<sup>5</sup> In 1995 PNETS charges were 9 cents but OFTA estimated the PSTN usage cost (network costs divided by traffic volume) should be revised down to 6 cents.

<sup>6</sup> The following analysis applies the procedures adopted by the Australian Industry Commission 'International Telecommunications reform in Australia' available: <http://www.indcom.gov.au/research/other/phone/index.html>

cost of making an IDD call, and take into account the net revenue (-/+) from accounting rate settlements, then total cost<sup>7</sup> is given by the formula:

$$TC = RC(O+I) + S(O - I)$$

and

$$TR = p(O)$$

where  $TC$  = total cost;  $RC$  = resource cost;  $O$  = outgoing traffic;  
 $I$  = incoming traffic;  $S$  = Settlement rate;  $TR$  = total revenue;  
 $p$  = average weighed IDD call charge.

The only unknown is the weighted average settlement rate. The USA publishes accounting rates (settlement rates are usually 50 per cent of accounting rates) and the UK and New Zealand have recently followed suit. In 1995 the USA-HK settlement rate was \$1 per minute (HK\$7.8). The settlement rate between Hong Kong and mainland China was considerably higher, as was traffic volume.<sup>8</sup> For purposes of this exercise I have assumed a weighted average of \$4.50. This may be an inaccurate measure total cost, but the exercise is easily rerun (using Microsoft Excel 5.0 Solver) using alternative assumptions.

In 1995, using our revised outgoing and incoming traffic data (ie, excluding callback) we have:

$$TC = \$0.61(3,024,722) + \$4.5(132,072) = \$2.4 \text{ billion}$$

$$TR = \$6.7 \times 1,578 \text{ million} = \$10.5 \text{ billion}$$

A competitive price  $p^*$  would be one that equates total cost and total revenue,<sup>9</sup> where total cost includes the cost of capital, which is assumed to be 15 per cent in Hong Kong.<sup>10</sup> It is known that  $p^* < p$ , but the additional assumption that is now required is the price elasticity of demand  $h$  for IDD usage. The financial model used by the SAR Hong Kong government in the determination of the Framework Agreement with Hongkong Telecom assumes a price *inelasticity* of -0.3, which happens to correspond

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<sup>7</sup> An accountant's view of cost is different from an economist's view of cost. A settlement rate outpayment is an accounting cost, but economically it is not a cost, rather it is a redistribution of income according to an agreed procedure which could easily not exist.

<sup>8</sup> Traffic outgoing to the USA was 6 per cent of total, whereas China outgoing traffic was 52 per cent of total. Incoming percentages, and therefore traffic balances, are not published.

<sup>9</sup> This is a static assumption. In a dynamic world, especially of telecommunications, the incentive to invest in an increasingly competitive and risky environment raises the question of what risk-premium should be built into the cost of capital. See also the following footnote.

<sup>10</sup> This raises the important question of what rate of return on capital has been assumed in the FCC's figures. It also raises the question of what should be considered a competitive rate of return in Hong Kong. It is standard practice for the Hong Kong government to use 15 per cent (nominal) as the benchmark for utilities.

exactly with my own estimate made for 1994-95.<sup>11</sup> With this assumption we have the following condition:

$$O^* = O + \{[(p^* - p)/p] \times h\} \times O$$

subject to:  $(O^* \times p^*) - \{RC(O^* + I) + S(O^* - I)\} = 0$

which says that at a new competitive price,  $p^*$ , outgoing minutes will rise from  $O$  to  $O^*$ , without violating the constraint that the new total revenue equal the total cost incurred (ie.,  $TR - TC = 0$ ). Running these simultaneous equations provides the following result:

$S = \$4.5:$	$p^* = \$2.88$	$O^* = 2,101 \text{ million minutes}$
$TC = \$6 \text{ billion}$	$TR = \$6 \text{ billion}$	

From these results it can be seen that a competitive IDD price in 1995, without callback and with the current accounting and settlement rate in place, would have been around \$2.88 compared with the weighted average of \$6.70.

However the revenue implications are enormous. At a price of \$2.88, total revenue would slump over 50 per cent, from \$10.6 billion (or \$12 billion without callback) to \$6 billion. This could have severe implications for future investment in the network unless (a) other revenue opportunities are opened up, or (b) new entrants are prepared to drive investment. Are either of these likely of a sufficient scale?

We can go one step further and assume ISR has totally by-passed the accounting rate system. What then would be the 'access charge' for interconnect between the ISR operator and the domestic FTNS operator? The OFTA consultative paper *Review of the Delivery Fee Arrangements* (P 025(98)) foresees access being determined purely by commercial agreement. This need not be a baseline price. For example, international carriers may prefer corresponding relations which guarantee proportional returns of traffic between them, and are therefore prepared to pay a premium over and above absolute cost. But for the sake of the argument, let us assume that the ISR domestic interconnect access fee is at cost. In Hong Kong today this is, in effect, the ISP PNETS charge of HS4.6 cents. (This underscores the fact the Internet telephony can be viewed as a form of ISR.) Plugging HK4.6 cents into the above formula renders the following results:

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<sup>11</sup> See Economic Services Bureau 'Provisional Legislative Council Supplementary Briefing on the Surrender of the HKTI Licence' Annex A p.3. Also see J. Ure 'Telecommunications' in Cheung Y.L. and M.H.Sze eds. *The Other Hong Kong Report 1995*. Hong Kong: The Chinese University Press (pp.380-401).

$S = \$0.045$	$p^* = \$1.01$	$O^* = 2,251 \text{ million minutes}$
$TC = \$2.2 \text{ billion}$	$TR = \$2.2 \text{ billion}$	

Clearly, this undermines a business case rather badly. But it could happen, with possible dire consequences for the ability or the incentive to invest in the local network. Further, the first casualties would be the three new FTNS operators unless, of course, they were the ISRs and had the market to themselves.

### Future of FTNS?

1. Without corresponding relations with overseas carriers, the FTNS operators will be hard-pressed to compete in this market. (For example, a corresponding relation based upon an agreed access fee of HK\$1.50 would be consistent with an average IDD tariff of HK\$1.65, and a total cost/revenue of \$3.6 billion.)
2. Without a substantial local network of their own the FTNS operators will be hard-pressed to negotiate anything from ISR operators.
3. If the FTNS operators held an oligopoly of four gateway licences they could possibly undercut ISR.
4. Gateway licences assume IRUs (Indefeasible Rights of Usage) or ownership rights in submarine cable consortiums (or satellite circuits), but there is limited cable capacity going across the Pacific Ocean, although rather more available going West, but with many junctions to Arabia and Europe on route to North America. The three new FTNS operators will be hard pressed to buy into cable capacity, especially at a price significantly competitive against ISR. Many of the ISR competitors are likely to own IRUs already.
5. Investment in new cables will take several years to realize.

### Options for FTNS

1. FTNS operators could be given periods of ISR and/or gateway exclusivity - but this would violate the spirit if not the letter of the WTO Basic Agreement on Telecommunications and would be vigorously opposed by overseas operators; nor would it lie easy with the policy of maintaining Hong Kong as Asia's premier hub.
2. FTNS operators could 'partner' with international carriers, but 'partnership' is difficult because it involves sharing management and control over investment (scale, timing, priorities, methods of financing, etc.) - temporary and shifting alliances are more likely scenarios, not least because the international carriers themselves are frequently changing direction, re-prioritizing, etc.
3. FTNS operators could sell-out. This may be difficult for the SAR Hong Kong government to swallow, but in a commercial world anything is conceivable. (BMW has just reached an agreement to buy Rolls Royce - the dismal decline of British industry or the triumph of the new era of globalization?)

4. Conditions could be attached to gateway licences - international carriers seeking gateway licences could be required to invest in Hong Kong's infrastructure, either in partnership with an FTNS operator or directly, for example by landing additional cable capacity which would be available to FTNS operators who choose to become original IRU consortium members.

There are probably many other options. Today's debate may identify some of them.

### The Domestic Dilemma

1. The key issue facing each FTNS operator is how to make money from the domestic market. The answer maybe: there isn't one.
2. OFTA's consultative paper *Review of the Delivery Fee Arrangements* (P 025(98)) argues that tariff rebalancing will offer the new FTNS operators the opportunity to make money. Local traffic non-sensitive line costs (ie. network costs allocated to PSTN divided by subscriber lines) were estimated by ESB in *Legislative Council Economic Services Panel: Review of the Pricing Structure of Local Telephone Services* (1996) to be \$75. Traffic-sensitive usage costs (ie. costs of setting up a call and maintaining the connection) were estimated to be 6 cents per minute, so the average residential and business usage costs (ie. 6 cents x average monthly line usage) were estimated to be \$27.72 and \$33 respectively, giving rebalanced (ie. cost-price) monthly rentals of \$103 and \$108.
3. OFTA's paper also, however, anticipates that HKT may not rebalance fully owing to increased FTNS competition, but this suggests that the opportunities for new entrant FTNS to make money from the local loop are very limited.
4. How to escape the inevitable conclusion that reduced IDD revenues will not be compensated by rising local loop revenues and therefore that not all four FTNS can survive? If there is an answer it seems it has to come from one of two directions: (a) China mainland - the long shot; (b) value-added services and the 'new media'.

### Uncharted Territory

1. Mainland China is entering a period of major restructuring and radical overhaul. The new Ministry of Information Technology and Telecom Industries will take time to reorganize its constituent parts (MEI, MPT, MRFTV, Areospace) - but there is little evidence that dramatic policy changes are likely in the near future, especially with regard to non-mainland companies operating networks and network services; but a new era of cautious experimentation is likely sooner or later.
2. Over the one-hundred years of telephony the one part of the entire network which has remained essentially unchanged is the means of customer access, the basic telephone. While tone dialling has opened the way to many online digital services, the telephone is inadequate as a means of handling the inter-active world of converging media technologies. Soon a smartphone-cum-PC-TV will emerge from the shadows to revolutionize customer access. For example, it may be a large wallscreen which can be operated by a remote control from the armchair, with dial-tone, Web-access, video-

phone, inter-active e-commerce capability, and so on. When and what the technology will be remains uncertain, but without it the mass consumption of inter-active commercial services will remain confined and fragmented. Services such as VOD are broadband pioneers in this area, educating the advance-guard, but how rapidly will the demand diffuse to broader sectors of the community and a broader range of services? Not until access is as simple as operating a phone or TV, despite the fact that well over 40 per cent of families now have a computer at home.

3. Providing the new inter-active services requires a new network architecture. The fully-meshed small-medium-sized exchanges belong to a past era. The new era requires fibre-optic rings, remote DFs and subscriber line equipment to differentiate duplex traffic streams. Fewer, larger exchanges with very high-capacity high-speed switches will serve as nodal points for content dissemination and traffic routing. For that reason, the opening of 50 per cent of HKT's exchange lines may turn out to be irrelevant to the future development of the new FTNS operators. It also means that HKT may inherit legacy costs when shifting towards a broadband configuration. And while Wharf Cable is building a network of modern design, its conversion to a fully duplex network capable *simultaneously* of mass broadcast and subscriber-line inter-activity will be costly.

4. The points above suggest that necessary for both supply and demand to grow significantly (profitability) in the age of the new digital media a dual of new thinking and new technologies is required.

5. What is necessary may not be sufficient. There is possibly a role here for Government action, in particular in promoting collective, social use of the new media, building social infrastructures and expanding the definition of universal service. Government activity in this area (cf Hong Kong's other social welfare policies) could work on the demand and supply sides simultaneously, providing a social market to buoy-up the service providers and encourage their network and services growth ( for example, to community centres, public housing estates, libraries, school, hospitals, etc) and encouraging the social acceptance of new forms of information technologies. (See forthcoming report of the IIAC.)

## Regulation

1. I take the view that deregulation does not mark the end of regulation. Clearly interconnection issues, dominance issues, and consumer protection issues, to name just a few, will remain important. There is, however, a fundamental problem in a rapidly changing and commodified world: the market fragments on both sides, among different types of service providers and among different customer groups. The concept of the 'public interest' (in whose name regulation is normally conducted) becomes more difficult to define, while the concept of 'consumer protection' perhaps becomes a more manageable one.

2. That, in turn, raises the question of whether specific industry regulation should be replaced altogether with competition policy - basically, fair trading legislation. This is the view of the Hong Kong Consumer Council. I, for one, think Hong Kong would benefit from an Office of Fair Trading, a complaints ombudsman.