



Telecom Infotech Forum

Regulating Telecom Pricing in Wholesale and Retail Markets – Has Hong Kong Got It Right?

Venue: Bloomberg Auditorium, 27/F Cheung Kong Centre
2 Queen's Road Central, Central
Time and Date: 2 – 5.30pm Tuesday 13 November, 2001

2 – 3.30 pm – Asymmetric Regulation

Keynote speaker: Yip Hak-kwong, Director of Policy 21 Ltd, University of Hong Kong – Asymmetric regulation in Hong Kong

- John Ure, Director, Telecommunications Research Project – PNETS for PMRS
- Agnes Tan, Director, Legal, Regulatory & Carrier Affairs Division of New T&T – FTNS interconnection
- Stuart Chiron, Director of Regulatory Affairs, PCCW – Telecoms policy in Hong Kong

3:30 – 4:00 pm – Coffee Break

4 – 5.30 pm - Lessons from Other Markets – Chair: John Ure, Director of the Telecommunications Research Project, University of Hong Kong

Keynote speaker: Andrew Lih, Principal Investigator, Interactive Design Lab, Columbia University – Telecom policy in the USA

- Richard Fawcett, Partner, Bird & Bird, Hong Kong – Telecom policy in the EU
- Michael Reede, Partner, Paul Weiss Rifkind, Hong Kong – Telecom policy in Asia-Pacific

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NOVEMBER 13, 2001**



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Executive Summary

1. The 1990s was the decade of telecommunications liberalization in Asia-Pacific, including Hong Kong, and the 2000s is likely to be the decade of regulatory stock taking, review and revision. Some liberal reforms have gone well, notably in the cellular mobile and international markets. Some reforms have been achieved belatedly, such as the elimination of subsidies and the rebalancing of tariffs. And some reforms have been problematic to say the least. The application of competition policy is one problem area, and the lack of effective competition in the customer access network or local loop is perhaps the most dismal failure of all. The comfort is to know that this experience is pretty much worldwide, which perhaps means that the source of the problem lies less in regulatory vigilance and application than in the approach itself. The November 2001 Forum is therefore devoted to a very important subject for the entire industry, from carriers to customers, and TIF wishes to thank **PCCW-HKTC** for sponsoring this particular forum and making it possible. Our thanks also to **Bloomberg** for again making available their splendid auditorium at the Cheung Kong Center in the Central business district.
2. The occasion for this TIF arose because of the issuing by the regulator, OFTA, of the *Implementation of the Full Liberalization of the Local Fixed Telecoms Networks Services Market from 1 January 2003: Consultation Paper*. OFTA proposes to open the FTNS market entirely from 1 January 2003, and this in turn calls into question the effectiveness and relevance of existing regulation. Should there be more of the same? Should the emphasis shift towards more effective implementation? Or is it time to rethink? To change direction, and if so, in which direction? What lessons are to be learned from other jurisdictions, and are their debates relevant to Hong Kong?
3. **Yip Hak-Kwong is Director of Policy 21 Ltd at the University of Hong Kong** after having a distinguished career in the Census & Statistics Department of the Hong Kong Government. He sets the scene for this TIF with some thought provoking research findings, his main message being that investment in telecommunications in Hong Kong began what appears to be a slowing down from the later 1990s while rival regional centres, such as Singapore and Taiwan, have displayed much stronger growth. Crucial to such findings are the indicators chosen to measure the trends, and clearly these are open to interpretation. For example, there are signs that mobile penetration in Hong Kong has reached saturation point while Taiwan has recently overtaken Hong Kong. Fixed line penetration rates per household also seem to be declining, but whether this is due to a failure to keep pace with population growth, or whether it has some other cause, for example Hong Kong's strong growth of broadband which does away with the need for second lines, remains open to question. But whatever the causes, the **Mr Yip's** point is that a slowdown of investment also reduces employment and the economy suffers the loss of the multiplier effects.
4. But **Mr Yip** also makes the point that Hong Kong still has not achieved its stated objective of promoting effective local loop facilities buildout. In 1998 HKTC had 98

per cent of direct exchange lines and ‘because the incumbent operator is still dominating 90 per cent of the market in terms of network ...there will be continued regulation. This seems to be the message.’

5. In his presentation **John Ure, Director of the Telecommunications Research Project, University of Hong Kong, and also Director of the TIF**, argues that publication of OFTA’s liberalization Consultation Paper offers a chance to cast the net wider by thinking also about fixed-mobile issues, such as interconnection and convergence, especially with 3G and broadband mobile Internet on the horizon. On interconnection, he argues that the use of FDC was introduced at a time when LRAIC was not available and when cross-subsidies were the norm, so with a receiving party pays billing system and no local fixed line call charges mobile operators ended up billing for calls in both directions. In the resulting interconnection regime, called PNETS in Hong Kong, mobile operators pay for not just the core network costs apportioned according to mobile traffic on the network, but also indirect local loop costs. Moving to LRAIC, or even Sender-Keeps-All (SKA) or Bill-and-Keep (BAK), would remove this indirect cost which could be recouped through tariff rebalancing since there is still evidence of consumer surplus in existing fixed line tariffs. Such a shift would also facilitate a move to calling party pays which may be more consistent with fixed-mobile convergence, and with 3G. Both **M.H.Au, OFTA’s Deputy Director** and **Michael Reede from Paul Weiss Rifkind** questioned the shift to LRAIC, especially whether or not this implied the use of current rather than historical cost. In Hong Kong exceptionally high and rising property prices have traditionally distorted these calculations and OFTA has always taken a pragmatic view, choosing the lower of the two calculations.
 6. **Agnes Tan, Legal, Regulatory & Carrier Affairs Division of New T&T** echoes the theme that carriers should be treated on a more equal basis with regard to interconnection, this time in reference to competing fixed line carriers. In a free market peering implies equal status in terms of traffic, otherwise a hierarchical status is the norm, but in a regulated market where the policy objective is to promote competition peering should be considered the basis of the relationship. Even then the problem remains of enforcement and of regulatory drag. OFTA has mandated the unbundling of the broadband customer access network, what in Hong Kong is called Type 11 interconnection, but until such time as a determination is made the ‘tariff charge is \$198 per month plus \$1,491 one-off installation for full bandwidth option. It charges \$182 per month and \$2,576 one-off installation for partial bandwidth. PCCW’s tariff for residential customers is \$198 per month, plus \$530 one-off for installation. To its ISP customers, \$196 per month and \$530 one-off installation charge. With that level of charges at the wholesale level there cannot be any viable business case based on broadband type II interconnection.’
- By listing similar examples, **Agnes Tan** illustrates the harsh commercial realities the new entrants or ‘second networks’ (2Ns) face. The question is then whether the combination of regulatory drag and high (wholesale) network charges act as major disincentives to network investment by 2Ns. **Stuart Chiron, Director of Regulatory Affairs, PCCW** naturally does not think so. On the contrary, his position is that

phase-out of local loop unbundling is essential if the right signals are to be sent to the 2Ns to build out their own customer access networks. He points out that Singapore, Canada and The Netherlands all have phase-out policies to address this issue. Further, he argues strongly that all FTNS licences should include build-out requirements. If this were the case then January 2003 would not represent an open door to service-only providers. **Stuart Chiron** adds that in regard to network interconnection regulation should be symmetric, a reference to the requirements on cable TV. This again raises the interesting question of what is the appropriate regulatory approach to convergence. Currently the set-top box technologies are not sufficiently standardized to allow seamless interconnection for the end-user.

7. The floor discussion ranged over several points, including fixed-mobile interconnection, the problems carriers face gaining access to buildings owned or managed by affiliates of their rivals, and the degree of 2N commitment, to which **Agnes Tan** replied that New T&T will be tripling their target for residential build-out during 2002. **Peter Lovelock, Deputy Director of TRP and TIF** and chairing the session, added that Hong Kong should not underplay itself. China, for example, was watching carefully how Hong Kong handled its highly successful rollout of broadband, and indeed broadband does seem to be doing far better in Hong Kong – as well as places like South Korea – than in many parts of Europe or North America. Does this mean that Hong Kong will have to pioneer regulation in this area.
8. Our keynote speaker for the second session is **Andrew Lih, Principal Investigator, Interactive Design Lab, Columbia University** who gives an excellent review of telecoms policy in the USA and also reference to Canada. As background **Andrew Lih** refers to the 1984 break-up of Ma Bell, the Telecoms Act 1996 and the remerging of the RBOCs who have increased their market share *since* 1996 from 50 per cent to 80 per cent. But the ‘part of the 1996 Telecom Act that has reconfigured the current landscape is the unbundling provision specifically at “Any technically feasible point within a carrier’s network”, and using a forward-looking pricing scheme on these unbundled elements.’ Despite strong objections from some economists, notable Alfred Kahn (see the appendix to John Ure’s submission to the OFTA Consultation Paper) and Nicholas Economides, the FCC’s TELRIC pricing scheme (in Europe, LRAIC) has become the regulator’s benchmark for ‘best practice.’ Does TELRIC/LRAIC remove the incentive to build rather than buy? Whatever the reason, **Andrew Lih** points out that only 3 per cent of local loops in the USA have been built by the new entrants, the so-called Competitive Local Exchange Carriers (CLECs). In other areas the 1996 Act has also been as failure up to now. For example, only 1.3 million people use cable telephony in the USA. Broadband rollout has also hit problems of quality and poor interconnections, with recent evidence of customers seeing nothing but a bad value proposition. The bright spot in Andrew’s Lih’s presentation arose from the tragic events of 9/11, the role of the Internet which kept working when conventional telephone lines and mobile networks failed. This raises an interesting question: should network charges include the costs of redundancy? It would certainly make life more difficult for colocating 2Ns.

9. Switching focus to the European Union **Richard Fawcett of Bird & Bird** explains how the European Community approach begins with a general body of competition rules which apply across all industry sectors, and that directives coming out at the moment are focusing on the regulation of electronic communications networks and services, not limited narrowly to 'telecommunications'. The EU is departing from distinctions between telephony, broadcasting, Internet. There is also a move away from individual licensing towards general authorizations, paving the way for recognition of the market as an open one. Incumbents that were once monopolies and may now remain 'dominant' in their respective markets are designated as having 'Significant Market Power' which is regarded from three directions: direct market power, power with others, or power over related markets. Arising from these considerations the suggestion of structural separation at the local loop level has been raised. The thinking has been prompted by the almost universal failure to date of local loop unbundling. This is a theme echoed in at least some of the submissions to the OFTA Consultation Paper.
10. Finally, with a overview of the Asia-Pacific, **Michael Reede of Paul Weiss Rifkind** argues that context is all important for understanding how we got to where we are, for good or bad, and that this should enable us to review regulation in the light of (a) experience, and (b) changing context. For example, in Hong Kong 'the regulatory policy for domestic entry was not really combined with build commitments. Even in 1998 the build obligations that were renegotiated, they were not based upon incentives, they were based upon obligations.' For the result is that 2N local loop buildout has been retarded. He argues that by international standards Hong Kong's interconnection charges are very low, although in response **M.H.Au (OFTA)** cautioned that the basis of comparisons has to be studied very carefully. ['I think you cannot do an absolute comparison, you have to weight that against the retail prices for business line and residential telephone line and then see whether or not with that sort of weighted comparison Hong Kong's interconnection charge is still the lowest in the world.'] **Michael Reede's** fundamental point here is that any cost methodology can come up with different sets of figures, and really he wants to take the evidence of the market to decide which figure looks right. Currently a lack of facilities competition may signify that the prices are wrong, too low.
11. An interesting remark from a lawyer is his observation that it is widely acknowledged that Singapore has much higher network charges, but 'we cannot do a direct comparison of charges because Singaporean charges are subject to the Official Secrets Act and you would actually be jailed if you were to disclose them.' He also observes that lobby groups can influence regulators, at least by keeping an issue in front of them. In the US in 1996 some ISP did not pay access charges as the service was not considered as commercial in the early days, and 'there was a very, very strong lobby group in Hong Kong to reduce the ISP charge. It is still a strong lobby group with many members. Not surprisingly, that pressure does lead to a further emphasis towards a progressive lowering each year.'

12. Looking ahead, **Michael Reede** sees third carriers (3Ns) entering the market after January 2003 and even a fourth group (4Ns) who are large corporations, such as banks, wanting to serve themselves and their clients. The implication is that network charges will require serious review under those circumstances to see who qualifies for reductions, and what costs, including what element of shared costs, should be allowed. Time did not permit discussion in detail of the points raised by the three second session speakers, but very clearly they threw up (a) experiences, including failures, from overseas jurisdictions that mean that Hong Kong cannot let others do its thinking for it, and (b) issues that have to be addressed when January 2003 arrives.

Tuesday, 13 November 2001, 2.10 pm conference commences.

James Ogilvy-Stewart: Ladies and gentlemen, good afternoon, I'm James Ogilvy-Stewart. For my sins I'm responsible for our business in this part of the world, this region, which incorporates for us Greater Mainland China, Korea, Thailand, The Philippines as well obviously as our business here in Hong Kong. I just wanted to add my welcome to you all on behalf of Bloomberg. It's a pleasure for us to provide our facility here and clearly the rain wasn't enough to dampen the enthusiasm for a lot of people. "Regulating Telecom Pricing in Wholesale and Retail Markets -- Has Hong Kong Got It Right?" Well, I checked some news on my Bloomberg terminal and there are varying views on that and I'm sure those views will be aired in the course of this afternoon. I was reminded recently when I was at a conference in Seoul of Alexander Graham Bell's predictions that: "The telephone is valuable. I envision that at least every town will have one." Sure, you've heard that many times but it is interesting for us to reflect that that was I guess getting on for 100 years ago, or slightly over when he said that, but the fact that 30 million of us across the globe not only have a phone at home but are welded to our cell phone devices; I think that is also kind of interesting.

Telecommunications and communications in general is a fascinating area and clearly one that sparks considerable debate. You're not here to listen to me this afternoon so I will finish here. But, again, on behalf of Bloomberg we are delighted to see you and I am sure it is going to be a very interesting afternoon. Thank you very much.

John Ure: Thank you very much James. Just to say on that note, that reminds me that one of our invited guests today is David Butcher who was the Communications Minister in New Zealand. David is here as part of the World Bank team looking at universal service and Cambodia, so not every town in Cambodia necessarily has a telephone and I am doing some work at the moment in Indonesia and certainly not every village in Indonesia has a telephone, so there is still actually quite a long way to go.

Before I do the official introduction, firstly, I would like to draw your attention to the fact that our web site -- where you will find all the proceedings papers under TIF here -- has recently added Data File as well as eLearning. Norman, who is sitting here, is our web master, he is responsible for the good design of this web site and these files might be useful to you where they contain basic data about telecoms around the region and this one contains, basically, material that can be used for training purposes and research purposes. If anybody has material that they would like to put up on the site, it is available to everybody who visits the site, so please do contact me to do that.

A couple of announcements before we move on. Firstly, to the press who may be here, the house rule is please do not quote directly or attribute remarks without asking the permission of the person who has spoken. If you abide by that rule I am sure there is usually no problem. Secondly, we would like to thank PCCW for the sponsorship of this TIF. Sponsorship does not guarantee that the forum will necessarily come up with views that are entirely those of the sponsor but we are grateful to PCCW. Our deputy director of the TRP, Peter Lovelock, in the front here, will be chairing this first session.

Unfortunately, Linus Cheung was not able to make today's meeting so I will probably be chairing the second session unless PCCW would like to chair it. We will discuss that in the coffee break. That is all I have to announce at this stage. Peter, would you like to take the floor as the Chair.

Peter Lovelock: On that basis, we are doing it slightly differently this time. Each session, as you will see in the agenda, we have a keynote speech. For this one, the first session, we have Mr Yip Hak-kwong speaking about the research he is doing into the end user benefits of telecommunications, deregulation in Hong Kong. So on the basis of Mr Yip providing the context I am going to abdicate the Chair very quickly and we will bring each speaker up one at a time. So following then will be John, then Agnes Tan from New T&T, and finally Stuart Chiron from PCCW. Without further ado let us get it moving.

Yip Hak-Kwong: Thank you, Peter and John. I would like to share with you today what our research has done for the past year. I understand that in the forum we have experts talk about interconnection models, so today I would like to approach the problem from a different perspective. We discuss by asking very simple questions, questions that ordinary citizens would ask: What is the effectiveness of telecommunication policy in Hong Kong? In terms of: what are the benefits to me as an ordinary consumer, to investors and to Hong Kong? Then we come to John's question in the web site: Is it time for a change? And in which direction should we be heading? Before I start I would like to rehearse a note of congratulation for the impressive records the Government and the Telecommunication Authority in Hong Kong has done. It is too familiar to you about the licences that have been issued for the past 8 years since 1993 when OFTA was first set up. Before I proceed perhaps somebody may ask: Have I used the wrong slides? Or have I picked the wrong indicators? I remember when I was working for the World Bank and the ADB in Cambodia and Vietnam, if I use this kind of output indicators I would probably be thrown out of the country or the room very shortly because we are not talking about outputs, because all these are not outcomes. The purpose of Government regulation is not to issue licences. Of course, the objective of OFTA is not to issue licences.

What are the outcome indicators that we should be looking at? It is not for me to say. Let us look at Government policies. Vision. As the leader the strategy is to build infrastructure and the objective is to be the leading telecommunications house in the world. Another document; we should be talking about quality and prices and high performances. In fact, there is one report to the Legislative Council a year ago and the purpose of liberalisation is for the consumers in terms of lower prices, quality, investment and employment and job creation. So research we are trying to look at is not interconnection charges, not models, but something which we as consumers are longing for, network development, prices, quality, investment, productivity, employment and, very important for Hong Kong today, job creation. We tried to look at indicators, and there are some around, about fixed line penetration, mobile penetration, broadband. Unfortunately, there is not much information on broadband when we compare across economies in the world. Let us take the digital line. In fact, Hong Kong boasts to be one of the first countries in Asia to have 100 per cent digitalised telephone line in 1993. This

is really an impressive record that we are all proud of. The second line is Singapore. Singapore is catching up. Taiwan, Japan are catching up. That means that by now everybody, all the main countries in Asia, our competitors in Asia, they are 100 per cent digitalised. This is before we have any liberalisation policy in Hong Kong.

This is a complicated chart but I would like to show it at once because it looks at the residential lines per 100 households. That means the penetration of *fixed lines* in Hong Kong compared with our competitors in Asia, Singapore, Korea, and Taiwan. The red line is Hong Kong and Taiwan is the blue line. We will see that we have achieved 100 per cent penetration, that is, the number of lines to 100 households in Hong Kong, several years back. But since then Hong Kong is drifting back. Compared with Singapore, Taiwan, we are losing a lot in terms of the number of fixed lines. In 1991 we were ahead but by 1999 we were lagging behind Taiwan and Singapore. Since 1996 the ratio is declining. The implication is that the number of families in Hong Kong is growing faster than the number of fixed telephone lines installed in Hong Kong. There is something we boast about, *cellular* subscribers in Hong Kong, because we have the highest penetration rate. This is the rate for Hong Kong, over the past year it has risen rapidly. This is based on the ITU March 2001 publication, the ITU Year Book. We will see that Singapore is behind Hong Kong. Taiwan and Korea are also behind, but you will see the trend that is picking up very, very quickly. This is the situation up to 1999. The graph speaks for itself, that we are still ahead up to 1999. But before I came to this forum I looked up the updated statistics and, unfortunately, on 21st October the updated statistics were published, this is Hong Kong, we are still moving rapidly ahead. Singapore and Taiwan, if we look at the trend that we extend 1, 2, 3 years we will not be able to say that we are the first in Asia because Taiwan has caught up marginally.

Prices. I think everybody in Hong Kong is familiar with prices. We have enjoyed a very good reduction in the IDD rate over the past years and this is something that we are proud of and to be congratulated. But mind you, if we look at countries all over the world, everybody is enjoying similar if not more reduction. In fact, one of the latest surveys of the ITU of 34 countries, they find out that the percentage reduction per year between 1998 and 2000 is at the rate of, on average, 20 per cent a year. So what we have achieved so far is not remarkable if we compare with the world record. In fact, three or four years ago the Consumer Council pointed out that all the competition is not benefiting the consumer most, they are targeting the business users.

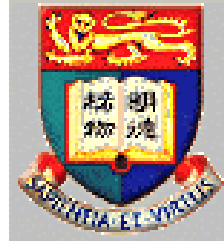
This is another set of information I hope will not bore you, it is about *capital investment*. This is the rate of change because comparing capital investment between economies is difficult, it depends on the size of the countries we are talking about. We cannot compare in terms of capital in absolute terms between Hong Kong or even with Korea, so we look at the rate of change between years and see how Hong Kong is varying. You will see the red line as usual is for Hong Kong. In 1992 compared with 1991 we are doing quite well, investment is booming, we have positive increase, over 50 per cent increase. 1993, 1994 investment changes are not smooth because investment is not like a costing model, we do not have incremental investment. What is worrying starting 1996, consecutively, 1997, 1998, 1999, there is a decline in investment in the telecommunication industry. Whereas

in other countries, notably, Taiwan, Korea, they have very positive growth. Of course, quite closely related to investment is *productivity*, it is the choice between capital and labour for the economist. I try to measure productivity in terms of staff per revenue, revenue in the whole industry. In order to compare between economies we have to put it on the same footing. So in 1991 we put it at 100, so it is a sort of index of growth. The red as usual is for Hong Kong. The graph speaks for itself quite well; related to investment in terms of productivity, revenue per staff which, if the industry is competitive, it means the salaries of staff is not catching up compared with other countries, notably Taiwan and Korea. This is employment creation. Without going through it all, starting 1996 something has gone wrong, I don't know why. Investment is declining and employment generation is not doing well. Employment, total full-time staff is declining. So what are the outcomes that we are trying to look at, regardless of what we talk about, sophistication of models, then network development. All the red indicates something that we should look closely at; prices and quality, quite good, investment, employment. So the question will obviously be, any researcher will ask: Has the time come for a change? Do we need to look closely at what we are doing in the industry? Or what regulation in Hong Kong has helped, has brought benefits to investors, to Hong Kong? This begs the issues and I do not think it is sufficient for me to discuss. I just focus on several very simple questions like I have asked. Questions like: Whether the approach is pro growth, pro employment? Whether it is efficient? Whether it is market driven? Or whether it is consumer oriented? These are very simple questions. We just look at one sector, say the FTNS market. Back in 1996 the Consumer Council said that the incumbent operator has 99 per cent of the network. The Information Technology Bureau said by 1998 it is 98.5 per cent. We have done a survey just recently and it indicated that it is still 90 per cent by the incumbent operator. In short, there has not been much growth in terms of competition, in infrastructure development. Indeed, one of the researchers of the University of Science and Technology has mentioned the international traffic people are making use of the infrastructure to compete for services for international traffic. In 1996 what the Consumer Council has warned is that there will be a lack of competition for local services. **So what we have looked at for the past six years of the policy is that there will still be a need for regulation because the incumbent operator is still dominating 90 per cent of the market in terms of network and there will be continued regulation. This seems to be the message.**

I would ask one question before we proceed. *Are we going for service competition or are we going for facilities competition?* That we should promote competition between operators to invest and then we can discontinue with regulation altogether in the next few years. If we look at competition elsewhere, I think some of our speakers will no doubt touch on it later, in other countries it seems to me that they are emphasizing putting the focus on facilities competition. This is research done by one of the University of Berkeley researchers. A Finnish researcher also made this conclusion, that in the USA investment is through infrastructure rather than services. In Canada and The Netherlands they have a limited period for mandatory abandoning. What they are advocating is facilities competition. I come to *efficiency*. This is a very, very difficult question to look at but a very simple question for economists because there is no such thing as efficient if the price is determined administratively and not by the market. Certainly a price can be

determined, it is really a choice between a market economy or a planned economy. I won't go into detail but there's a lot of debate but, basically, the choice is, whatever models, if you try to set a price for the market, what one has to do is you have to forecast demand, you have to look at risks of capital, at a lot of behaviour of the economies, of the market. In short, you have to micro- manage the market. We have a lot of bad experience if we look through what the planned economy has done about sign to set prices. I quote one of the researcher's conclusions conducted in 2001. He said that all methodologies about forecasting, estimating cost, because we do not have incremental changes in the market, it's just lump sum investment, consumers making lump sum decision purchases. Even in a country like the USA, the European Union, they don't have a satisfactory model for pricing. So the choice is really between micro-managing the market or leaving to the market to decide on the price.

Finally, I would like to look at *consumer interests*. Again, I won't dwell on this. I would like to raise the point; is there sufficient channels existing for Government to gauge what is the demand from consumers? This is the advisory mechanism at present. It is quite familiar to what it was 30 years ago when Hong Kong did not have the present day of representation in all levels of Government. So the question is: Is it effective? Especially if the Government policy is to intervene if there's an overwhelming public interest. So the present vehicle, is it effective to gauge the overwhelming public demand for intervention? I will quote one of the researches we have conducted. This is asking people, consumers, business about their awareness of the regulatory authorities in Hong Kong, it is less than one third. It is about one third for business consumer; less than one third, 20 per cent for residential. Have they ever contacted or been in contact with Government authorities? It is a very dismal low percentage. To conclude, the direction we should be heading, I would like to throw in three questions. Whether we are pro growth or pro employment or pro regulatory? Whether we need to micro-manage or to let the market determine the solutions? Whether we have a proactive consumer's oriented approach? Thank you.



Telecommunications Policy In Hong Kong

**Policy 21,
University of Hong Kong**

Scope of Discussion

- Effectiveness of telecommunications policy in
 - Promoting competition, to the benefits
 - Consumers
 - Investors
 - Enhancing Hong Kong's position as a telecommunications hub in Asia
- Has the time for change arrived?
- Where should we be heading?

Impressive records of liberalizations

- 1992, four public mobile radiotelephone service (PMRS) licenses issued
- 1993 Cable TV license granted
- 1993 OFTA established
- 1995 four FTNS licenses
- 1996 six personal communication services (PCS) licenses issued

Impressive records

- 1996, call-back voice service and international simple resale (ISR)
- 1999, competition in international services
- 2000, external facilities based competition
- 2000, FTNS license issued to HKCTV
- 2000, five wireless FTNS licenses
- 2000-01, 22 external FTNS licenses
- 2001, 3G licenses

Impress records

ARE

Outputs

ARE NOT

Outcomes

Government's Policy

- Vision
 - “a *leader* and not a follower in the information world of tomorrow”
- Strategy
 - “to *build capacity and infrastructure* to support a thriving information economy”
- Objective
 - One of the world's leading *telecommunications hub*

Reference: 2001 Hong Kong Digital Strategy

OFTA policy objectives

- A world-class **telecommunications center** for doing business
- High **quality** telecommunications services at competitive **prices**
- **High performance** in telecommunications measured against OECD economies

Source: Information Technology and Broadcasting Bureau (2001) *Policy Objectives*

Impact of liberalization

Report to the Legislative Council in 2000:

*Liberalization will result in enhanced level of competition, bringing benefits to consumers in terms of lower **prices** and better **quality**, and resulting in additional **investment** and creation of **jobs***

Source: Information Technology and Broadcasting Bureau (2000)

Expected outcomes of liberalizations

Network development

Prices and quality of service

Investment and productivity

Employment and job creation

Network Development

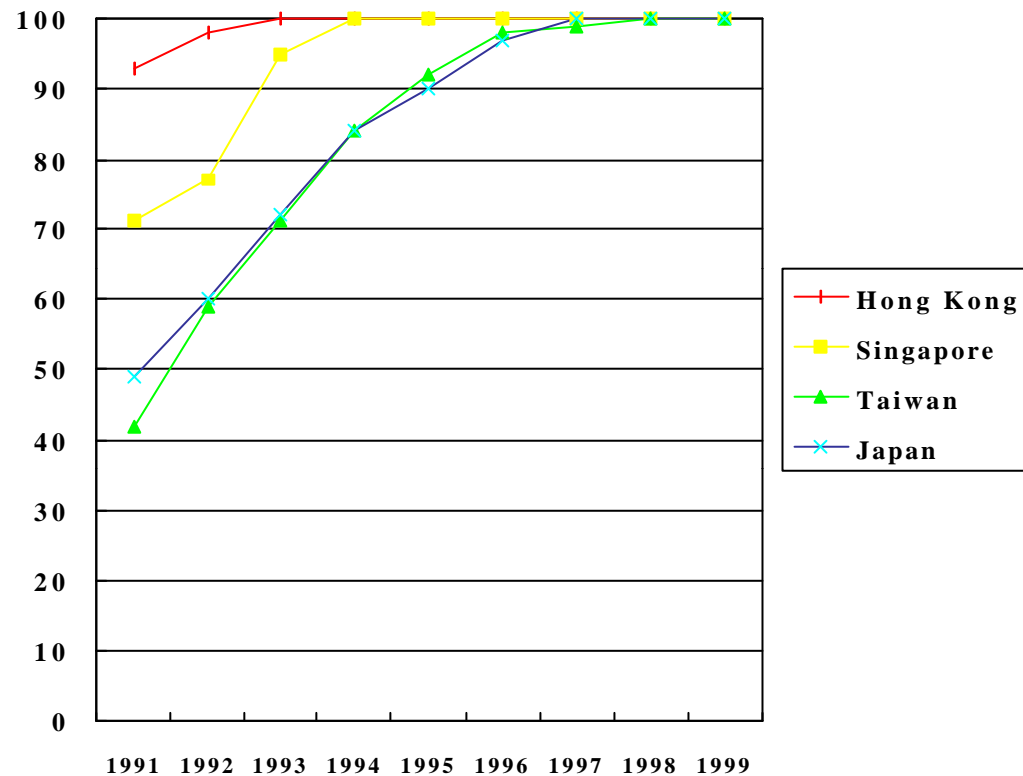
We will assess performance..... against the following indicators:

- The level of fixed line penetration,
- Mobile telephone penetration, and
- Access to broadband telecommunications networks

Source: Information Technology and Broadcasting Bureau, Policy Objectives, 2001

Percentage Digital Main Line

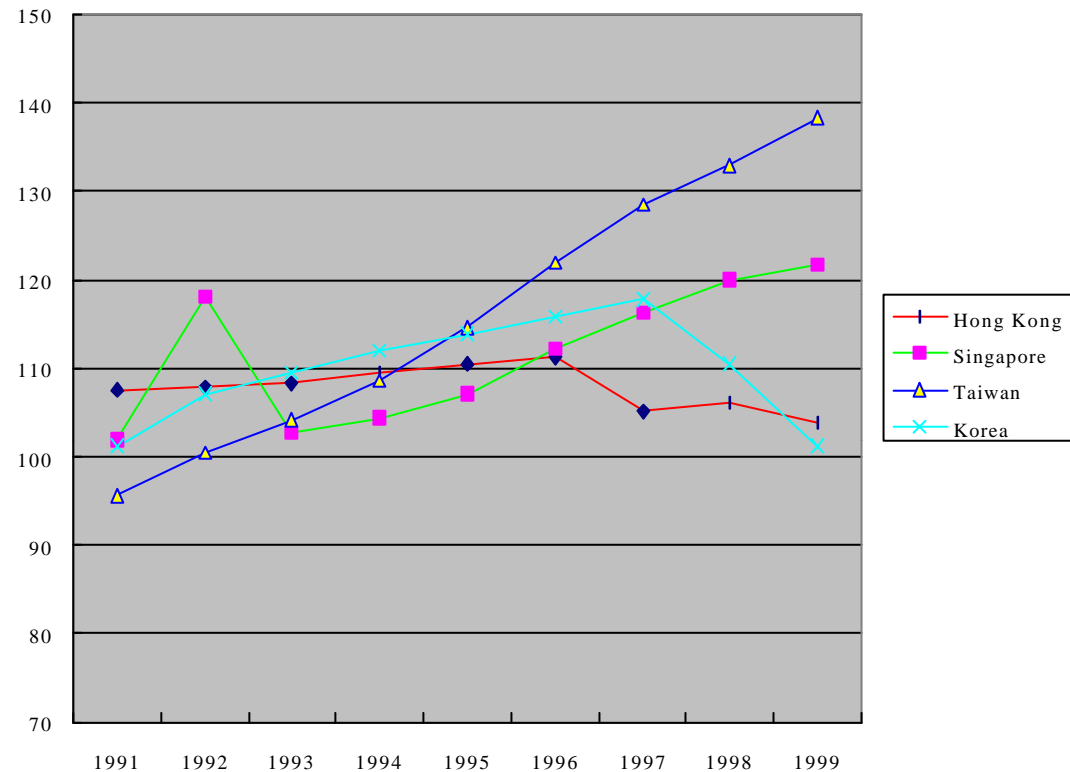
- 100% digitalized in 1993
- Before Govt's liberalization policy
- Market-driven achievement
- Other economies have caught up !!!



Data Source: ITU (2001)

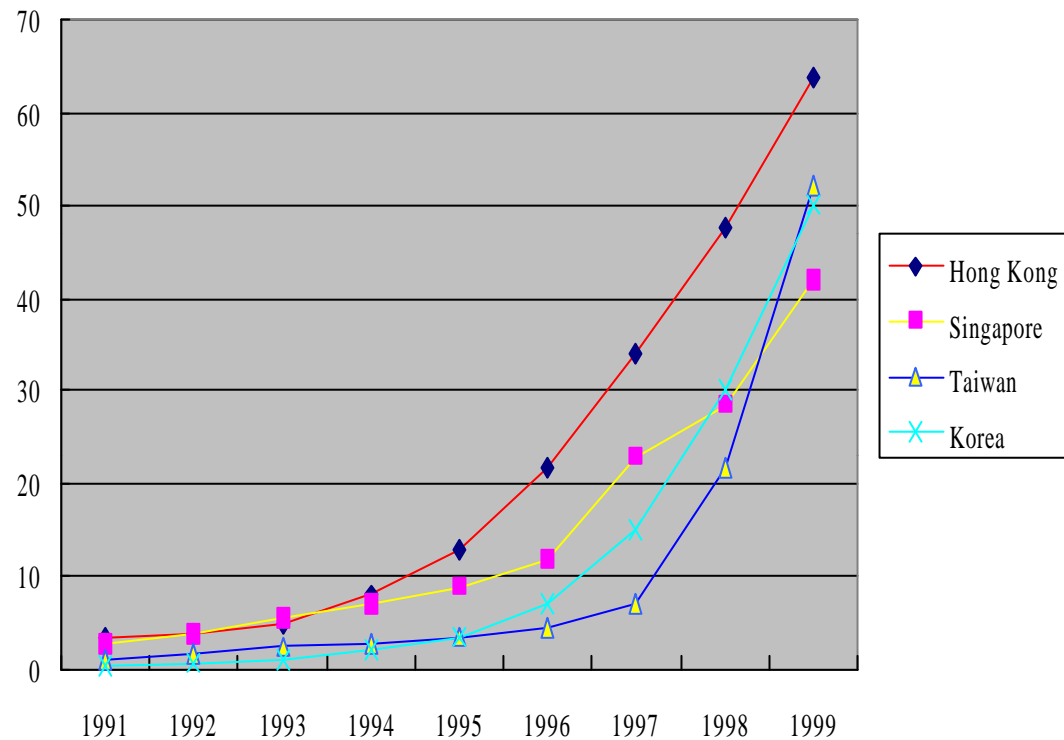
Residential Lines per 100 households

- In 1991, Hong Kong leading;
- In 1999, lags behind Taiwan and Singapore
- Declining since 1996
- Growth in no. of lines not kept pace with increase in no. of households



Cellular Subscribers per 100 population

- Still highest in Asia, but growth is leveling off
- Taiwan and Korea (liberalized in 1998) are catching up fast
- Other factors: technology-led, demand-driven

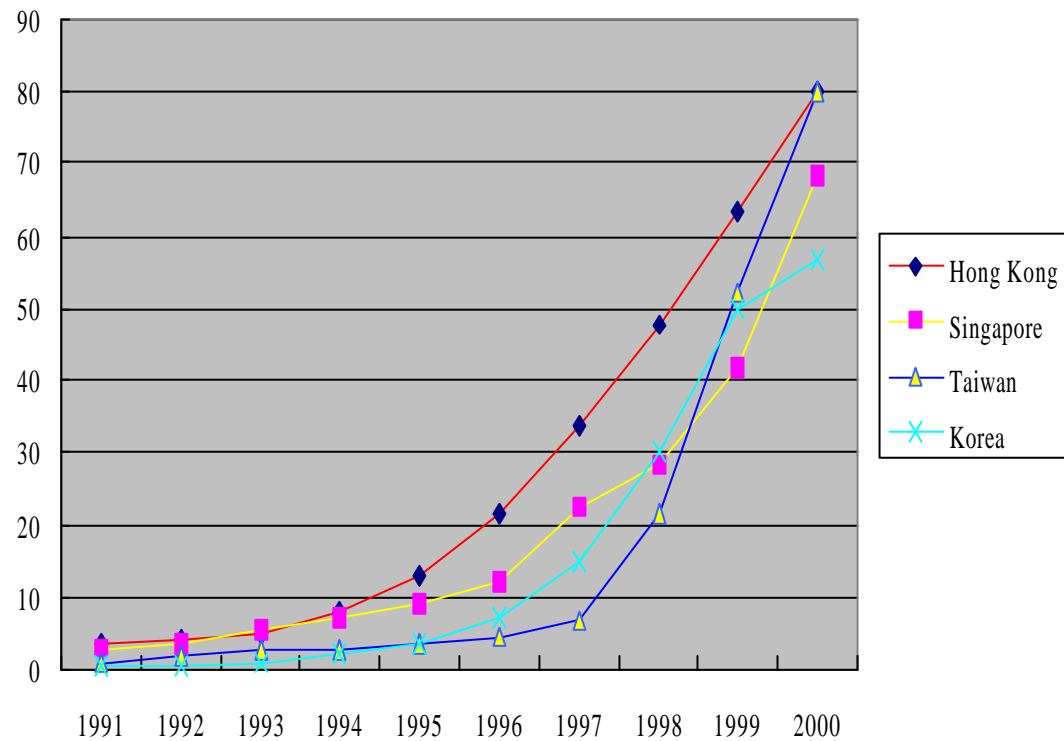


Data Source: ITU (March 2001)

Cellular Subscribers per 100 population

- No longer the highest in Asia
- Taiwan has caught up

Data Source: ITU (October 2001)

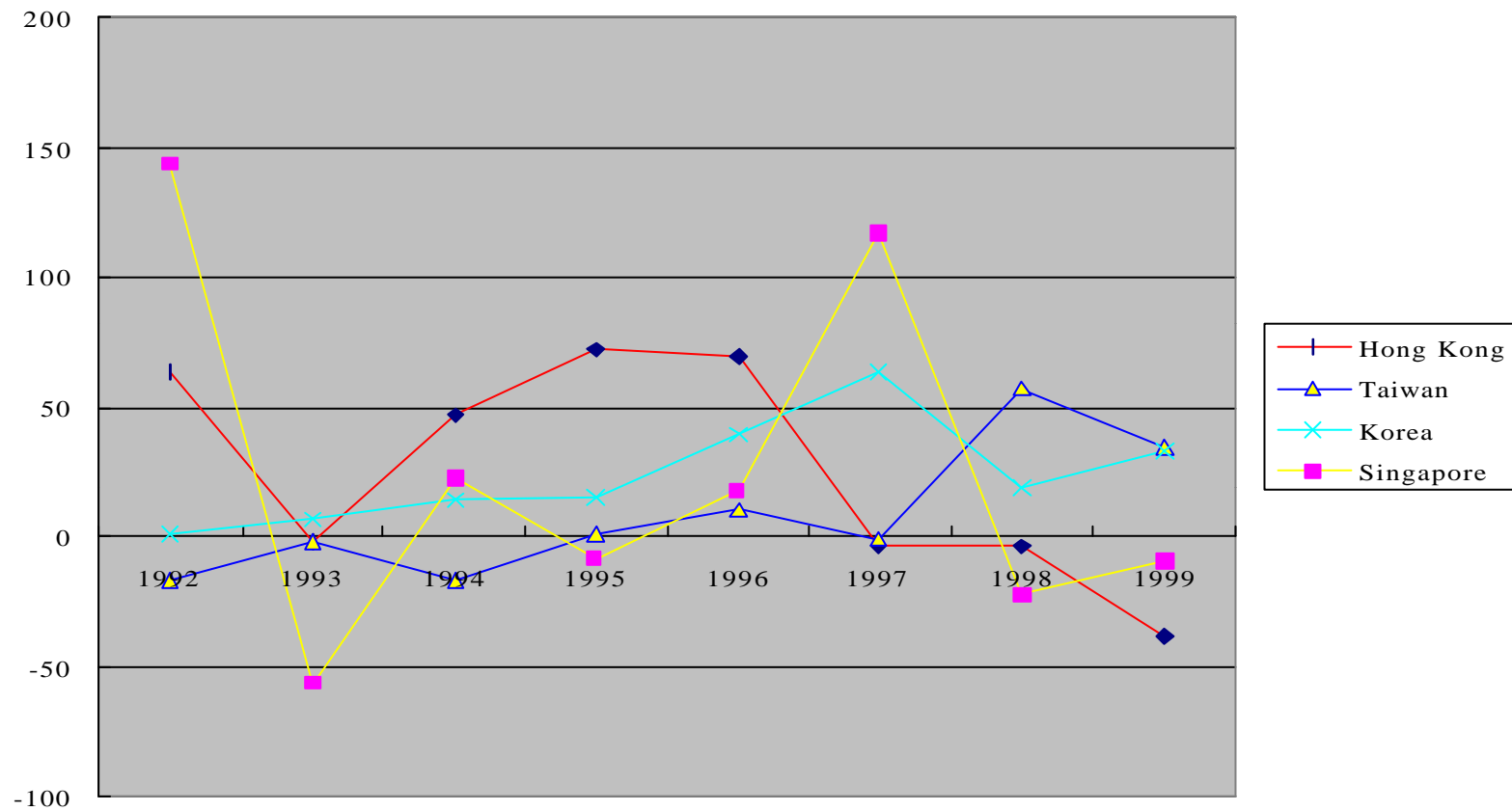


Prices

- Residential telephone monthly subscription rate increased by 61% between 1992 and 1999 (source: ITU(2001))
- IDD rate decreased 17- 46% between Dec 1997 and Jan 2001 (Source: OFTA(2001)).
- Consumer Council (1996):

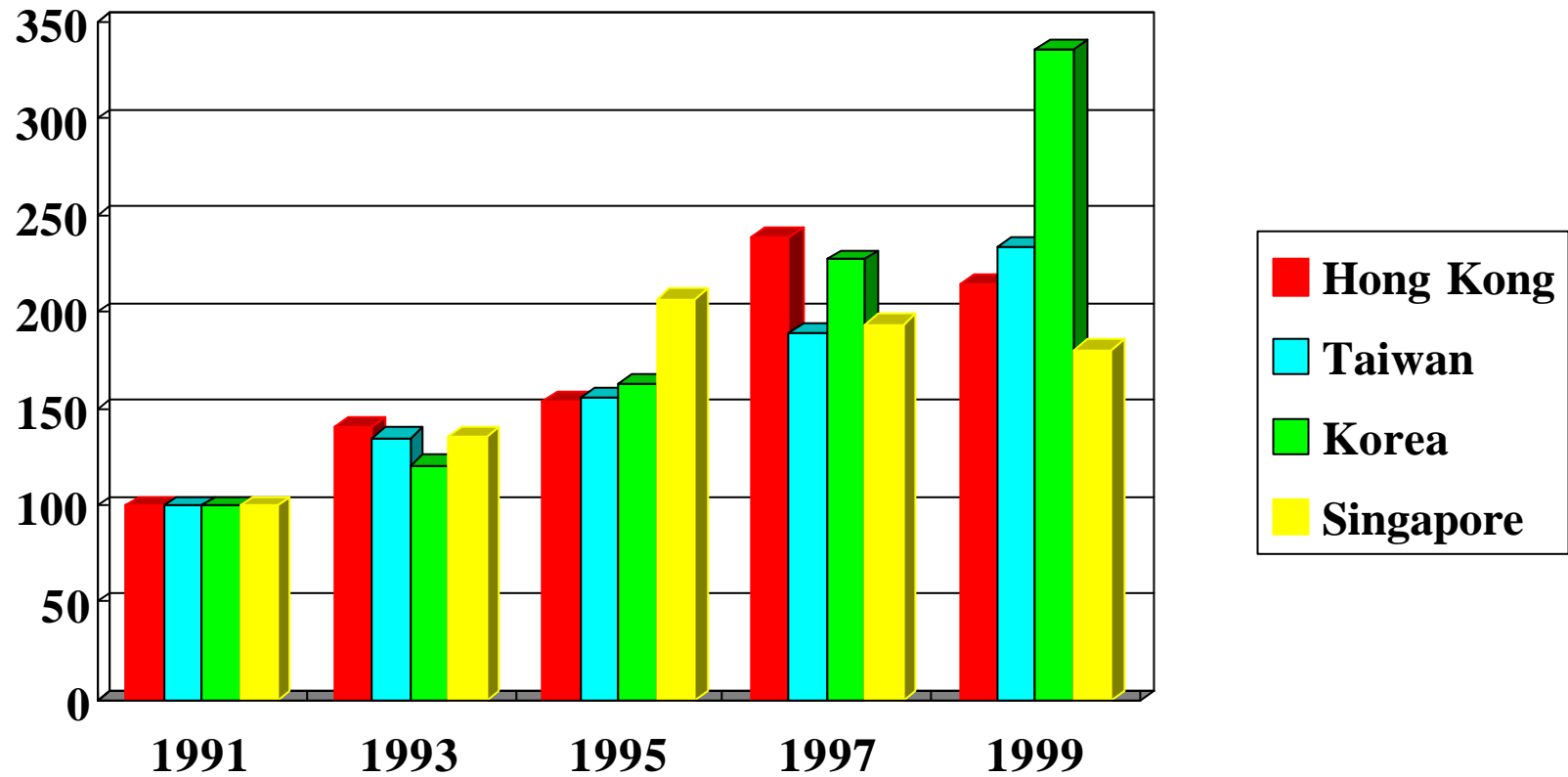
At present, most of the innovative pricing packages are aimed at businesses

Year-on-Year changes in capital investment

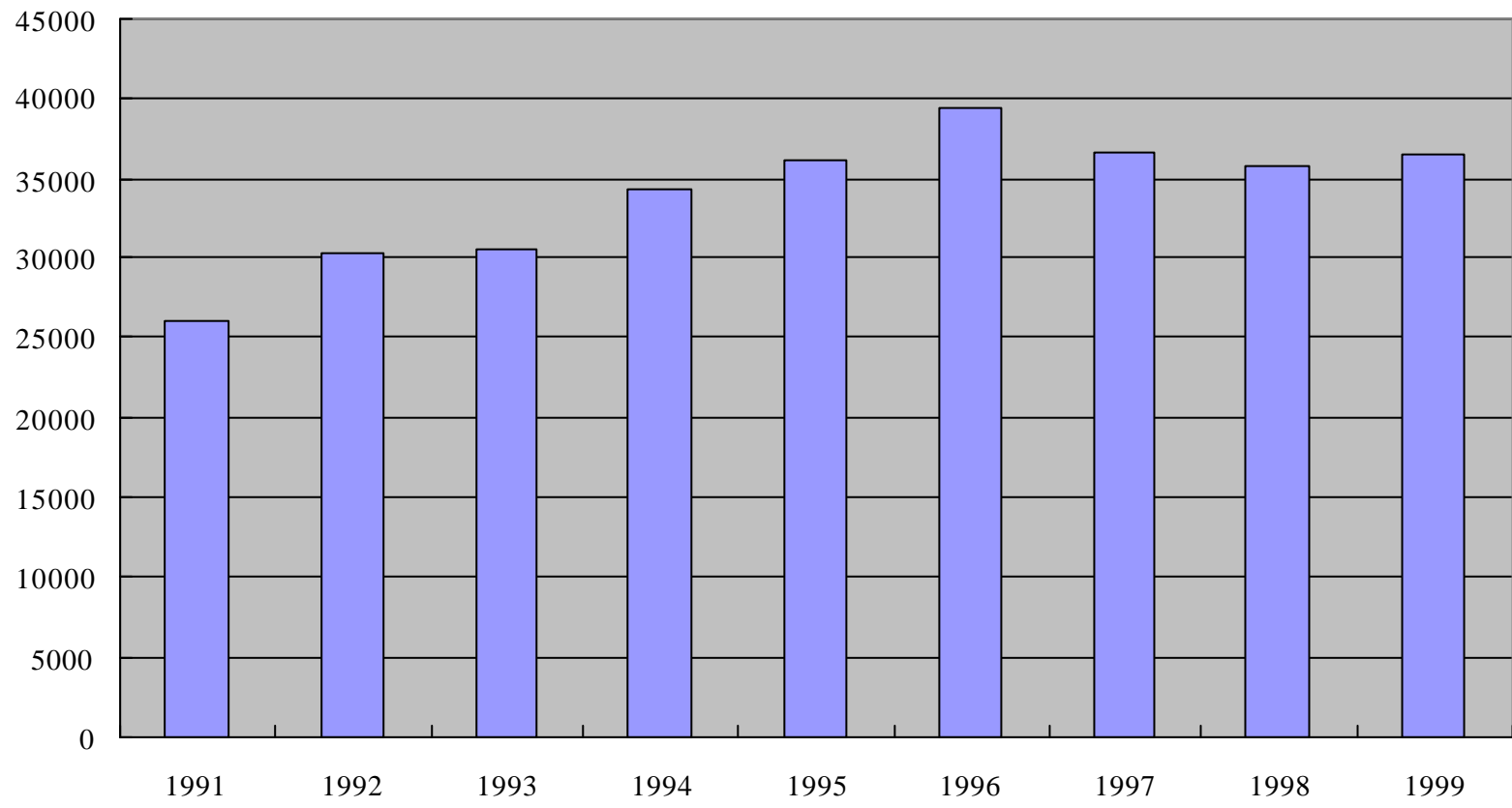


Index of revenue per 100 staff

(in local currency)



Full-time telecommunications staff



What are the outcomes ?

- Network development
 - Mobile: other economies are catching up
 - FTNS: lagging behind ?
 - Digitalized line: technology-led, market-driven achievement before 1993
- Prices and Quality
 - Bias towards business users
- Investment and productivity
 - Worrying trend after 1996
- Employment and Job creation
 - Negative growth after 1996

Regulatory approach

Questions:

- Pro-growth ?
- Efficient ?
- Market-driven ?
- Consumer's interest ?

Pro-Growth ?

(outcomes)

- Consumer Council (1996) : Incumbent 99%
- ITTB (1998) : Incumbent 98.5%
- Policy 21 (2001) : Incumbent over 90% (residential)
- Yan, UST research (1999): more than 30% international traffic go to new operators

Pro-growth ?

(impact of policy)

- Consumer Council (1996) :
 - *New operators focused on business where profits are highest*
 - *Lack of competition for local services*
- **6 years** of asymmetric regulatory policy:
 - *Short term gain: beating the dominant market leader*
 - *Long term gain: create a vicious circle of **disincentive to investment and continued regulation***

Choices Between

- **Service competition**

Reduce investment incentives, vicious circle of slow growth and control

- **Facilities competition**

Stimulate investment, virtuous cycle of investment and maximum market growth

Facilities competition elsewhere?

- U.K., Australia and New Zealand: facilities competition
- USA: compete through investment in infrastructure; leasing of unbundled local loops 0.2%
- Canada: unbundling of designated elements mandated for a limited period of 5 years
- Netherlands: from cost-based pricing to commercial over 5 years

Pro-growth policy for Hong Kong ?

- Consumer Council (1996)
Review interconnection charging principle
to provide investment incentives

Efficient ?

- OFTA (2001):
The LRAIC provides an economically efficient “build versus buy” pricing signal to the new entrants
- Market versus Planned Economy ?
 - Administratively determined price OR
Market price
 - Administratively set signal OR
Market Signal

Choices between

- **Micro-management**
 - Forecasting demand
 - Assessing cost of capital and risks, etc.

NERA consultant (2001)

All methodologies have limitations

EU has not yet established any specific method

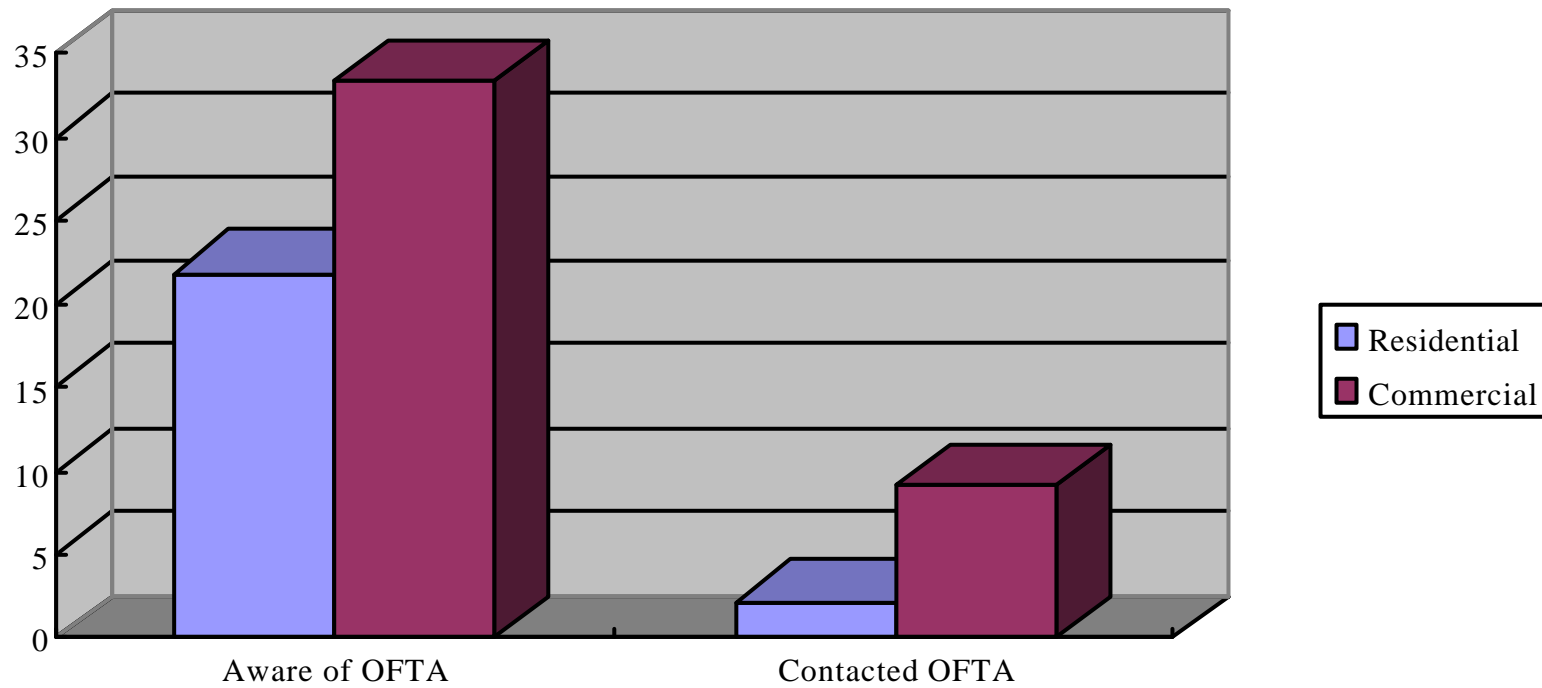
USA wrestling with cost determination since 1996

- **Market-driven solution**
 - Canada: unbundling of designated elements mandated for a limited period of 5 years
 - Netherlands: from cost-based pricing to commercial over 5 years

Consumers' interests ?

- OFTA Advisory Committee on Telecom Users and Consumers
 - Chaired by Assistant Director of OFTA
- Effective ?
- ITTB report to Legislative Council (1999)
 - Strong preference for market-driven solutions
 - Intervene where **overwhelming** public interest demands it

Consumers' Awareness



Thank you

Peter Lovelock: Thank you very much, Mr Yip. With the context in place let me give a proper brief introduction. For those of you I don't know my name is Peter Lovelock, I am the Deputy Director of the Telecoms Research Project. I currently live in Beijing, I am effectively John's beachhead for taking over China and dare I also say I do a day job of running a research consultancy. A very brief point I want to pick up from Mr Yip to help facilitate the rest of this first session, and the second session which is a little bit more comparative. Flying back in Hong Kong, because when John clicks I come running, it keeps hitting me over the last couple of months just how downbeat Hong Kong is at the moment. We heard about the fall in employment and this need for pickup. Hong Kong feels, in a morale sense, about as low as I have ever experienced it, which is strange because China and telecommunications is about as ridiculously upbeat as you can get right now. For all of this study we are going to do of the Hong Kong setting, you should keep in mind just how much attention gets given to what Hong Kong is doing. There is an immense amount of attention getting given in China right now to these developments in Hong Kong as a means for learning. We were supposed to have a meeting today on China's mobile commerce developments. We have an informal group of operators and vendors. The operators heard about the meeting and they suggested we call it off and have it next week so that I could come down and attend.

The pricing issues are phenomenally important to them for two reasons right now. One is, they see the transition of broadband being fundamental and they figured that in China they got the policy a little bit more right than the deregulation environment which took over the rest of the world through the 1990s, that the rate of competition has come back to haunt a lot of the developed markets and that the trade-off between rushing to competition and the need to keep reinvesting in the network is something which is played out in their favour. The need to stimulate demand by lowering prices, at the same time to balance that with the amount of money to come back into the network is something that they feel very consciously aware of and they are studying how Hong Kong handles these changes with quite a degree of intensity at the moment, to the extent that they asked if we would run a similar set of sessions up in Beijing. With that, let me bring on John Ure, the Director of the Telecoms Research Project and the recent joiner of the silly acronyms club, for someone who comes up with a forum entitled "Regulating Telecommunications Pricing in Wholesale and Retail Markets -- Has Hong Kong Got It Right?" which is about as boring a topic as I could think of titling, if you turn to the PNETS paper, "Pretty Nasty Economic Tariffing scheme?" John.

John Ure: Peter, you forgot to mention that we also invented a new licence in Hong Kong, FNTS, for some of those of you who received it via email. Mr Yip has very nicely laid out a whole range of issues on the kind of macro level. What I'm going to do is focus on just one area of debate which I think has been certainly rumbling along as it were in the underground or undergrowth but I think should now come out into the open because OFTA has issued a series of consultation papers this year on liberalising the market and on interconnection issues. So I'm going to focus today exclusively on the mobile fixed aspect of it. Agnes, I know, will be taking more up on the fixed

interconnection and Stuart will no doubt have a chance to reply to some of these issues and add others.

Just as a background, **where did the current interconnection regime come from in Hong Kong?** When the mobile licences were first issued in the 1980s a receiving party pays regime was introduced, or a mobile party pays might be a better way of putting it. There are various reasons for that. One reason, for example, is that there are no local call charges in Hong Kong. So the issue arose about: How did HKTC recoup any costs involved in sending calls to mobile networks that originated from the fixed wire network? Calls in the other direction obviously could be catered for by interconnection from mobile to fixed. So the answer they came up with was the idea that mobile operators would pay interconnection charges in both directions. Somebody has recently pointed out to me also that perhaps the only other model available at that time was in the US and a similar model was being used there. So network charges were charged to the mobile operator in both cases and network charges were based upon fully distributed costs.

Without going into too much detail, this is a useful little chart, it actually comes from a World Bank publication called the *Telecommunications Regulation Handbook* which is an excellent publication, it is about 200 or 300 pages long. It is downloadable for free from the World Bank (*InfoDev*) web site so go into it and have a look at it, it is very good. This comes from one of the appendices. It summarizes very nicely the various accounting cost mechanisms. Basically, at the top is incremental cost. In other words: By how much does your total cost increase if you have to provide the service? If you didn't provide the service, how much would you save? At the bottom are stand-alone costs and fully distributed costs which is basically the total cost of your operation divided by the total output, which in this case might be telephone lines. In the 1980s, fully distributed costs was basically all that telephone companies knew about because they didn't have to work out in detail what their costs were. There was no competition, there was no driving force behind that need to work out what incremental costs were. Needless to say, if you are a new entrant you prefer incremental costs as a basis for interconnection because you are paying less and if you are an incumbent you prefer a fully distributed cost basis because people will pay you more. FDC was introduced as the basis of the network charge in the 1980s, this was basically the incremental costs, plus a few knobs and whistles, plus the indirect local loop fixed cost.

So the question arises: **Why not, instead of including the indirect local loop fixed cost, simply increase the local tariff and just charge an incremental cost for the network charge for mobiles?** As I say, incremental costs were basically not known at that time so it would have been difficult to do. Secondly, local loop costs were heavily subsidised from IDD traffic revenue and to have re-balanced in the case of mobile but not in the case of IDD would have been slightly inconsistent policy-wise, so that issue did not really arise in the 1980s. Today it is different. Today incremental costs are known. The accounts manual that OFTA has issued, PCCW is required every quarter to fill it in and give the details of their cost. Secondly, the PNETS traffic—PNETS, for those of you not aware of the acronym, is not particularly nasty, it is a Public Non-Exclusive Telephone Service Licence. Basically, mobile operators have to have a PNETS licence and value-

added service operators like Internet service providers have to have a PNETS licence. Over 40 per cent of network traffic today is actually traffic from those two sources. If you add in the additional traffic from fixed wire interconnection, over 50 per cent of the traffic on the incumbent network is actually interconnection traffic. Cellular clearly is therefore a peer of the fixed network today. The actual numbers of subscribers to cellular now exceeds the number of subscribers to the fixed network. Therefore, economically it is the case that the cellular network actually adds value to subscribers on the fixed network. They have more people to call and they have more people to receive calls from. Finally, carrier licences have been introduced in this last year. They are divided into fixed carrier licences, carrier licences for mobile and carrier licences for satellite. It is suggested that this is a purely administrative convenience to put them on the same footing, but in practice they are not on the same footing, in particular, carrier licences for mobile do not have the same rights to cross public rights of way as the fixed. The suggestion I would raise at this point is that since the whole regime is going to be liberalised from January 2003, according to OFTA's latest consultation paper, it does seem to me that **this is an opportunity to consider fixed and mobile together rather than to maintain the separation in thinking.**

On the economic efficiency grounds, I believe that there is in fact a good reason to shift away from fully distributed cost. There is effectively a cross subsidy it seems to me taking place to the local loop because the indirect fixed charges are included in the interconnection charges. If the local loop was re-balanced it would simply increase to include those indirect fixed cost charges. Would there be resistance? There is always resistance to price changes. But we might note the fact that local loop charges at the moment for residential are \$110 a month. People are very happy to pay much more than that for their monthly mobile subscriptions. Clearly, mobile also includes an element of functionality i.e. mobility. Nevertheless, it does suggest that there is a large degree of consumer surplus, even now, in the local loop rental. In other words, people who are paying \$110, many of them, not all, would be prepared to pay more than that if they really had to. Another way of looking at that is, ask people how much they would need to receive in cash to give up their fixed telephone line. How many people for \$110 a month would stop having a fixed telephone line? Not many.

So I think there is a basis for moving from FDC to LRAIC or indeed even to a peering arrangement, which would be the next logical step. In other words, the mobile operators would pay the receiving network but would receive payment if they were terminating traffic from the fixed wire network. We might note that the logic behind fully distributed cost from an economic efficiency basis is really the build/buy decision. In other words, is it really sensible to pay that interconnection fee or to build your own network? That is an irrelevant issue as far as mobile network is concerned, it does not arise. In fact, it is irrelevant for the core or fixed wire networks as well, it is only an issue that really arises in the local loop fixed.

Finally, what would happen then if there was re-balancing? Firstly, mobile operators would have the option thereby of reducing their tariffs to their customers and that could conceivably increase the level of substitution as some people at the margin gave up their

fixed line phone altogether to adopt a cellular phone. Indeed, some of the figures that Mr Yip put up, I wondered whether there was an element of that in those figures.

Secondly, and perhaps more radically, **it would offer the opportunity to mobile operators if they wanted to take it of moving from receiving party pays or mobile party pays to a calling party pays** which is, for example, used mostly throughout Europe. Again, that would significantly increase the attraction of cellular phone subscriptions to users and, again, could accelerate substitution. But that's what markets do and that is how markets work if prices reflect the genuine costs of providing the service. Finally, **I think that move to calling party pays would certainly help the process of fixed-mobile convergence in a broadband world.** In a broadband world we would have symmetry in the area of voice where people would pay for outgoing voice calls and in the case of data we have what I would call asymmetric calling party pays system. In other words, where you are receiving what you have requested, so the request is the outgoing part and you pay for the downloading.

In summary, I think the points that Mr Yip was really raising was that we are at a crossroads in Hong Kong, the liberalisation from 2003 is clearly raising a lot of opportunities to rethink some of the basic issues that we have been working with quite successfully for the last 10 or 15 years and I think certainly fixed wire line mobile convergence and rethinking the basis of interconnection is something which I would urge OFTA to take on board. The reason I urge them is because at the moment it does seem that OFTA wants to deal with the issues rather separately. This is an opportunity, it seems to me, of actually dealing with them together. Thank you.

**PNETS -
Particularly Nasty Economic Tariffing Scheme?**

Telecoms InfoTechnology Forum

13 November 2001

**Regulating Telecom Pricing in
Wholesale and Retail Markets
- Has Hong Kong Got It Right?**

John Ure

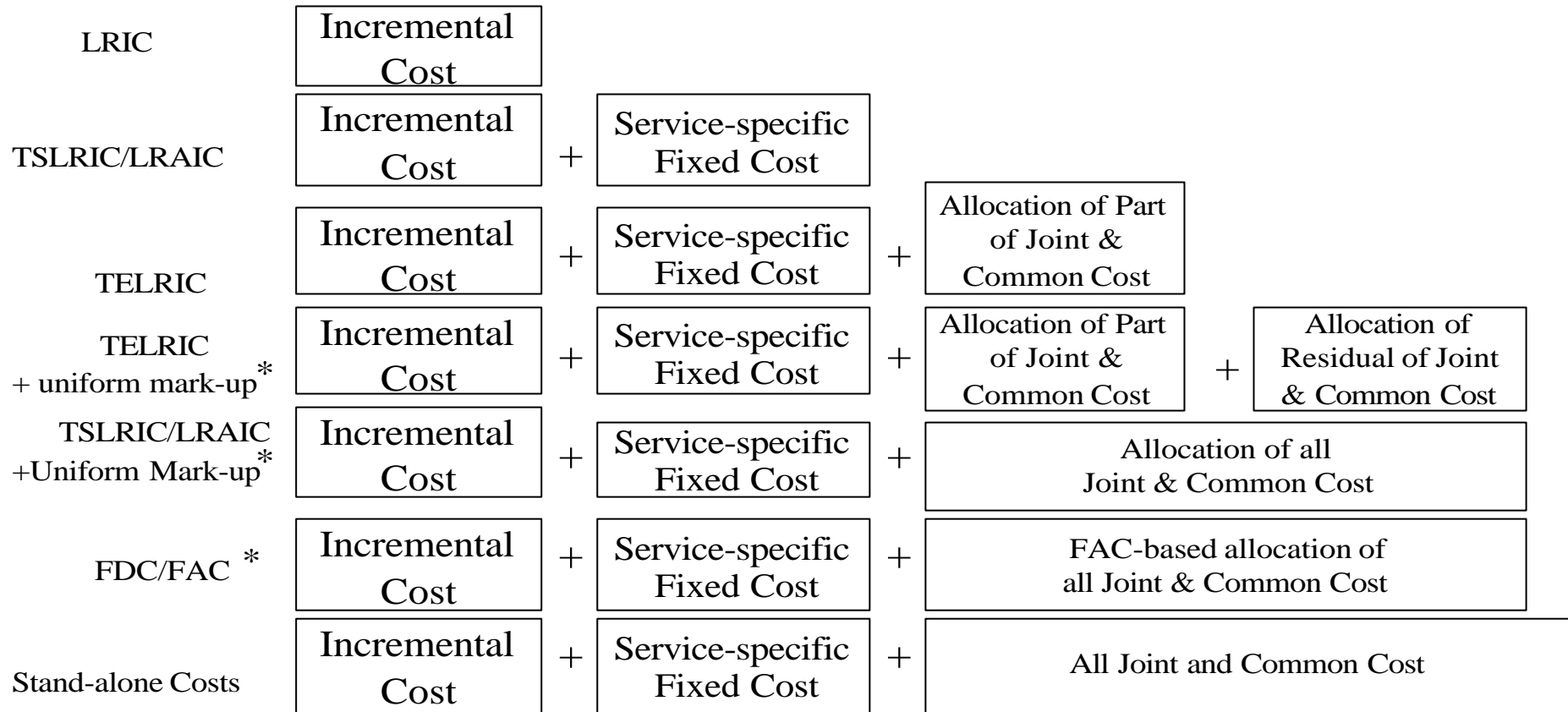
Director of the Telecoms research Project

www.trp.hku.hk

1980s: Fixed - Mobile Interconnect

- CSL and Hutchison = RPP (Receiving Party Pays) or Mobile Party Pays (MP)
- No local call charges = how would HKTC recoup costs of traffic *to* mobile networks?
- Answer = charge interconnection fees for outgoing as well as incoming traffic
- Network charges = Fully Distributed Cost

The Relationship Between Costs, Costing Methods and Allocations



- Notes:
1. For TSLRIC/LRAIC the increment is defined as the total service. Hence, indirect cost elements are shaded while direct cost elements are not shaded.
 2. In this example, FDC/FAC is assumed to be calculated based on forward-looking economic cost methodology.
 3. The total costs of the 3 cost concepts identified by an asterisk (*), do not necessarily have to be equal as shown in this example.
 4. Note the relative sizes of the costing concepts are indicative only and should not be taken as an approximation of an actual costs

Source: World Bank (2001) *Telecommunications Regulation Handbook*

No Alternatives in 1980s?

- $FDC = LRAIC + \text{Indirect local loop fixed costs}$ - so why not increase local loop rentals and charge LRAIC?
- Incremental costs not known in 1980s - no competition, no need to know them!
- Local monthly access rentals cross-subsidized from IDD = not consistent to rebalance for mobile interconnection?

Alternatives Today?

- LRAIC is available
- PNETS traffic > 40% of Network traffic
- PNETS + FTNS traffic > 50% of Network traffic
- Cellular is the peer of fixed (Note: mobile subscribers > fixed subscribers)
- Carrier licences = fixed, mobile and satellite
- place on equal footing?

Economic Efficiency?

- FDC = mobile cross-subsidizes local loop?
- Rebalance local loop monthly rentals to include proportion of indirect fixed cost
- Local loop = \$110 pm *cf* mobile = \$150 - \$200 pm = consumer surplus in local loop!
- Shift from FDC to LRAIC or peering/SKA?
- FDC = incentive to 'build' rather than 'buy'
- but irrelevant issue for mobile network

Fixed - Mobile Substitution and Convergence?

- Mobile operators can lower tariffs → increased substitution?
- End RPP (or MPP) for CPP? → increased substitution?
- CPP facilitates fixed-mobile broadband convergence?
 - voice = symmetrical CPP
 - data = asymmetrical CPP (sending or downloading)

Peter Lovelock: Before I bring on our next contestant: Who has a mobile? Who owns a mobile in this room? Let me do it the other way: Who doesn't? Good. So everyone has got a mobile in this room. Of all of those people who admitted having a mobile, if I walk around the room right now and give you HK\$1,320 who will promise to give up their fixed line? I figured he was sort of swinging into thin air. You have got half a dozen people out there who would give it up straightaway. \$1,320 a year. With that reality check let me bring on Agnes Tan, who is the Director of Legal, Regulatory & Carrier Affairs Division of New T&T.

Agnes Tan: Good afternoon, ladies and gentlemen. My topic this afternoon is "FTNS Interconnection in Hong Kong. Is it time for change?" The local fixed lines market was deregulated in July 1995 with licences issued to PCCW, Wharf New T&T, Hutchison Global Crossing and New World Telephone respectively. PCCW was the monopoly service provider before deregulation. It started with 100 per cent market share and now it has just over 90 per cent of the market share, whereas the other three operators together have at most 10 per cent of the market share. We have also seen the issuing of five fixed wireless FTNS licences issued in early 2000 and an FTNS licence to Hong Kong Cable TV. The Government has also just announced its intention to issue further wire line FTNS licences in 2002 with operations starting from 2003. I think the state of competition in the market should be the judge in deciding whether a change is called for. With the current state of competition we believe it is time for change. There are many issues requiring OFTA's urgent attention and resolution for the development of a truly competitive market in Hong Kong. These issues come in the form of excessive charges, excessive delay and restrictive provisions that deter the development of competition in Hong Kong. What I am going to tell you for the rest of my presentation will be the practical difficulties and the experiences that we have as a new entrant entering into the market since the Government first deregulated the market in July 1995.

First of all, I want to address *the relationship of the interconnecting parties*. It is important to recognise that each operator has the obligation to establish and maintain interconnection so as to operate in a multi-network environment. This also stems from the licence obligations to provide a good, efficient and continuous service to its customers. So we believe the relationship between the parties is one of equal standing with equal responsibilities. We believe that one operator should not treat the other as requester or provider as the case may be. It is not proper for one operator to have to request and beg for interconnection capacity and to commit on usage. It is also not proper in our view that the other party being requested should have the opportunity to review and consider whether or not it will accept the request, when to accept, and what terms and conditions. We believe to demand that would be to increase the competitor's costs and barriers. All these costs and barriers would weaken the other parties' ability to compete in the market. So we believe that when dealing with interconnection it is important to establish that relationship and the terms of interconnection between them should therefore truly reflect that relationship.

I mentioned earlier on that there are three issues that deter the development of competition, I will deal with each of them. First of all, in terms of *interconnection*

charges. Based on our own reasonable assessment, the charges imposed by the dominant operator in all cases are way above our own reasonable estimation and in all cases there is no transparency of charges and there is no cost breakdown. There is no room for meaningful negotiation because there has always been urgency. While there is a recourse to determination by the TA we know that it takes time and there is also the risk that OFTA may not accept the request and it wants to be convinced that it falls within the matter of interconnection under section 36(a) of the Telecom Ordinance, it wants to be convinced that there is consumer interest involved and that it will encourage efficient investment and so forth.

I want to deal with the *broadband type II interconnection charges*. As you know, OFTA has mandated type II interconnection for broadband in November 2000. PCCW recently published a tariff for broadband type II interconnection which is applicable to the FTNS licensees. The tariff charge is \$198 per month plus \$1,491 one-off installation for full bandwidth option. It charges \$182 per month and \$2,576 one-off installation for partial bandwidth. PCCW's tariff for residential customers is \$198 per month, plus \$530 one-off for installation. To its ISP customers, \$196 per month and \$530 one-off installation charge. With that level of charges at the wholesale level there cannot be any viable business case based on broadband type II interconnection. *Number portability for fixed lines*. It comes at a high cost. According to the last determination by OFTA, per line set up charge is at \$95.40 per DEL number, which is payable by the recipient network operator to a donor network operator. In most cases by the new operator to the incumbent as there is more chance of ported numbers from an incumbent to the new operator. Clearly, a high number of port charges deters the development of competition as it raises the cost of the recipient network operator. It is not hard to see the effect in the case of the mobile number port. There is no payment between the mobile operators so that is why you see the number of customers change is significantly higher in the mobile market than in the fixed line.

I want to talk about the *type I interconnection charges for VAS calls*. Currently there is a huge discrepancy between the intercarrier and the retail interconnection charges, which is clearly unfair, in our view. If you look at the pictures, PCCW's PNETS charges to its retail customers i.e. the ISP customers, these charges are reviewed by OFTA every year and is on a downward trend. Following the last review, the charge is now at 2 cents per minute. To compete with PCCW our PNETS charge to our ISP customers has to track very closely with that of PCCW's. Although, in theory, we can set our own charges, in practice, this simply does not work. On the intercarrier site the interconnection charge remains unchanged since the last determination by OFTA in 1998 and this charge is at an average of 2.5 cents. Therefore, for every minute of a dial-up traffic from PCCW to an ISP on our network we incur a loss of 0.5 cents. What it means is that other network operators, such as Wharf New T&T, are being penalised for winning over ISP's customers from PCCW. This represents a major discrepancy in maintaining fair competition in the market. This is an issue being acknowledged by OFTA in its recent consultation paper. From a fair competition perspective, this discrepancy should not happen or be allowed to exist in the first place.

Excessive delays, along altogether with excessive charges and restrictive provisions, all work against the development of competition. Excessive delays come in various forms, usually delay in providing proposals, quotations, in concluding agreements, in is just about everything, delay in service roll-out and therefore competition. In addition to excessive charges, there are other restrictive provisions which also work against the development of competition. For instance, ***the unofficial quota on the number of ports*** which the incumbent will perform per day per operator. Any volume above that quota will not be processed. When that happens, the customer could not switch over as scheduled and we will be left to deal with the customers' complaints in turn. Also on ***the cutover the local access links for the type II interconnections***, currently the quarter is at nine levels per cutover window during normal hours and 12 levels per cutover window during overtime per operator per exchange. This has been revised four days ago. It is still short of our demand but we will observe the requirements in the next six months. The Asia-Pacific Telecommunity has accurately stated the reality in our view. The interconnection market is simply not a competitive one and there is an imbalance in negotiating power between the related parties. Normally, the incumbent network operator has the market dominance in the interconnection market. So the new entrants were invited to this market.

There was even the AK-47 assault rifle type of fixed line licence. They were told to invest and commit with a market that they were told would allow true competition. Maybe we were naive but we were told that there would be proper regulation and we would be joining an organised and regulated market. As it turned out, it was pretty chaotic. The new entrants have opposed matters of pricing interconnection and even the very fundamental rules of the Telecommunications Ordinance itself, the effect of the endless complaints and arguments, uncertainty, delay and more grievances. And consumers, they are still waiting for the competition and the benefits that the Government promised. Six years after deregulation the biggest disappointment is that most consumers still only have one option for a local phone service. ***PCCW still controls 90 per cent of the local residential phone lines***. If Hong Kong really expects to get the competition that it has been promised it has got to make some very tough decisions. ***Here is what we believe OFTA should do. It should take a heavy-handed approach in dealing with the dominant operator*** and require that it publish all terms and conditions of interconnections and all charges. It should enforce the principle of the most efficient network operator. This ensures that one operator cannot raise his competitor's costs and with it the ability to compete. It should remove all restrictive provisions. It should introduce strict time lines for response and provisions of the proposal. It should have more resources to deal with requests for determinations and be proactive in monitoring market conduct and issue direct interconnection if agreement cannot be concluded within a reasonable time. If this plan were to be adopted we believe the telecom industry would look very different from what it does today. It would not be a dream world but it would certainly be a lot better than what we have got today.

Thank you.

FTNS Interconnection in Hong Kong

Is it time for Change?

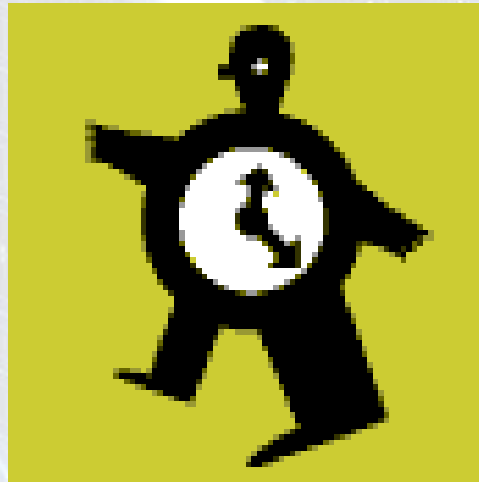
Agnes Tan
Wharf New T&T Limited
13 November 2001

Hong Kong local fixed lines market



- Deregulated in July 1995
- licence issued to PCCW-HKT, Wharf New T&T, Hutchison Global Crossing and New World Telephone
- Early 2000 - 5 wireless FTNS licences issued and FTNS licence to Hong Kong Cable Television
- Further licences to be issued in 2002 for operation from 2003

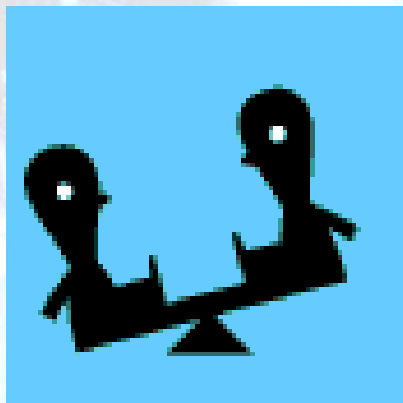
Is it Time for Change?



- **Yes**
- Need to eliminate
 - ☹️ Excessive charges
 - ☹️ Excessive delay
 - ☹️ Restrictive provisions

Relationship Between Interconnecting Parties

- Equal standing with equal responsibility



- Inappropriate to treat each other as "*requester*" and "*provider*"

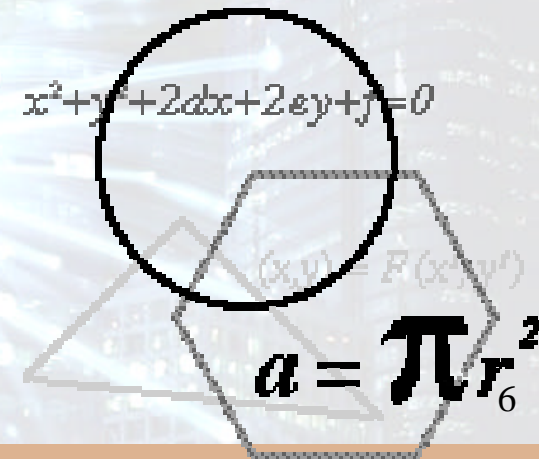
Interconnection Charges



- **Excessive**
- **No transparency**
- **Request for determination takes time and may not be accepted**
- **Eg. sub-tie cable 📶 250% overpriced**

Broadband Type II Interconnection Charges

- PCCW-HKT's Tariff for
 - Full bandwidth = \$198 p/m + \$1491 one-off
 - Partial bandwidth = \$182 p/m + \$2576 one-off
- PCCW-HKT's tariffs for
 - Residential customers \$198 p/m + \$530 one-off
 - ISP \$196 p/m + \$530 one-off installation charge



Number Portability

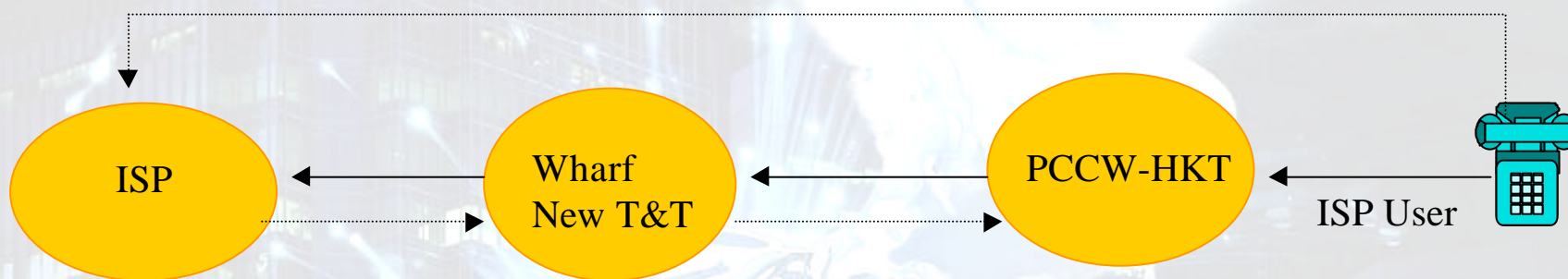
- Last determination by OFTA per line set up charge of \$95.40 per DEL number payable by recipient network operator to donor network operator
- Mobile Number Portability - no payment between mobile operators



Type I Interconnection Charge

For VAS calls

ISP User



ISP pays PNETS charge
(2.0) to Wharf New
T&T

Wharf New T&T pays interconnect charge
(originating charge) to PCCW-HKT
(average 2.5)

Excessive Delays

- In providing proposal/quotation
- In concluding agreement
- Just about everything
 - ✿ Delay in service rollout and competition



Restrictive Provisions

- Unofficial quota on number port
- Cutover of Local Access Links



Outcomes

- Asia-Pacific Telecommunity has this to say:

“... Interconnection market is not a competitive one and there is an imbalance in negotiating power between related parties. Normally, incumbent network operator has the market dominance in the interconnection market. ...”

What need to be done?

- Heavy-handed approach in dealing with dominant operator
- Dominant operator to publish all charges, terms and conditions
- Most efficient operator
- Remove all restrictive provisions
- Impose time line for responding to requests
- More resources for OFTA
- Interconnection first



Thank You

Peter Lovelock: Thank you, Agnes. I like this role, this is a good way of doing it. Can I just have a quick check again. You are all telecom people, you all know the difference between incumbent and dominant. Yes? Because the last time that I watched Stuart Chiron take the floor and enthrall the crowd he managed to make the students come back and tell me how much the dominant suffered and that the dominant really needed a little bit of help out there. It was good. With that, let me give you Stuart Chiron, Director of Regulatory Affairs, PCCW.

Stuart Chiron: Clearly, I should have taken the option where I could control the speakers and so next time we will pay more, it certainly would have been worthwhile. These are just some of the issues that I am going to try to plough through and then, hopefully, I will have time at the end when we all come up and I will be able to respond to the other speakers. These are the issues.

What I want to do is try to draw a clear relationship between liberalisation and interconnection and show how those issues are very much related and why OFTA now has before it two consultations that are (a) related and (b) critically important and these will determine a lot the future of the telecom market in Hong Kong over the next several years. In this first quote it shows the relationship that the Government realises that pricing, and this means pricing on interconnection, has an awful lot to do whether network competition happens or does not happen. This is the eternal debate about resale competition, which some of our competitors seem to thrive in and facilities based competition, which Dr Yip indicated would have substantial benefits to Hong Kong. These are a couple more quotes. You will see again that what we are talking about here is the need on a liberalisation policy to really focus on infrastructure competition and creating eventually the right make/buy point. Here is another quote from the Government actually more recently.

What is interesting here I think is the point that *future liberalisation should be facilities based*, yet when we look at the current consultation it doesn't tie anything to a facilities based investment or commitments. *So somewhere along the line we have forgotten what the underlying policy is*. I am reminded, and so I wrote this down so that I would get it right, even though I am sure I won't, since we are not being quoted, this failure to remember what was said before reminded me of a quote. "Implementation focussing on the details without revisiting policy principles and decisions. Policy principles without analysis." Okay, it was a takeoff on a Chinese leader. *The benefits of promoting independent infrastructure*. These things are pretty clear and there is no surprise. These are the consumer benefits of choice, innovation, service quality, there are no great secrets to these things. But the critical thing is the separate networks which is what the infrastructure competition is supposed to be about. These are not what you get with resale competition, it is not what you get when you simply unbundle local loop. In fact, *unbundling local loop to a large degree is inconsistent with infrastructure competition*. What you actually need to do, *if you introduce unbundled local loop resale competition you need to control it, you need to phase it out*. If your goal is infrastructure competition you cannot be running unbundled local loop at the same time. That is the message you get from Canada, The Netherlands and even from Singapore. All these

countries clearly favour infrastructure competition and what they do is they phase out unbundled local loop. Five years for Canada and The Netherlands, two years in Singapore. So if you are going to enter the market you have a strong commitment to build and you have got five years or two years to do it. At that point unbundled local loop as an interconnection wholesale service disappears and you just negotiate from there. If you want to get the benefits of infrastructure competition you have got to do that. Pretty easy stuff here. If you push for infrastructure competition you will have better growth in the industry.

I think Dr Yip's numbers would probably show that if we were not so tilted towards resale. But if you look at the other markets you see the curves are better. What you certainly get is more inward investment and a better possibility of job creation and also network redundancy. Actually, in the US since September 11, that last point has become more important. What does that mean for regulation? The first thing it means is you have got to make the correct make/buy signals on unbundled local loop. For us, that means ending the subsidy flow from PCCW to our competitors or, more specifically, from our residential customers to business users that are taking our service on a resale basis from the two Ns. ***In addition to the correct make/buy, you need commitments from the new licensees for significant infrastructure build-outs.*** You also need ***symmetrical regulation*** of our competitors in terms of unbundling interconnection and discrimination. There is no reason why one network should be able to provide service to one of its affiliates and then not offer the same type of service at the same terms, conditions and rates as somebody else. Yet that happens in the market here. If you were able to do this in terms of the correct make/buy signals and an infrastructure policy that required new licensees to commit and build, then actually you would have fewer interconnection disputes because you would have fewer type II interconnection issues. That, ultimately, would give you ***light-handed regulation.***

So the first part of the conclusion is these two things are very much related and they impact each other and in fact from a policy point of view you can make significant progress and whatever you want to do in terms of public policy in terms of making people build out to more residential and rural areas and moving them away from central business districts just by finally getting right infrastructure, competition issues and the make/buy point.

This is the boring page but it really gets down to interconnection practices here. What is right and what is wrong? ***What is probably wrong is that LRAIC is implemented in such a way as to give a very low interconnection price.*** That sounds good to new entrants but if you are pushing it at the wrong point in terms of PNET charges and unbundled local loop then you are going to get resale competition and services competition rather than infrastructure competition. So if the make/buy is wrong, nothing else will work. When you get into LRAIC you have got to recover the shared costs, and that means all the shared costs and not just the direct costs, and when you are running a telecom network, direct costs end up to be very little, a very small percentage of your total investment. So ***you have got to be able to take your joint in common and allocate them to interconnection.*** Network conditioning needs to be included. Depreciation

schedules have to be realistic, particularly today when things are written off a lot faster. Historical versus current replacement cost; the economic literature is pretty clear, that you should be using current replacement cost and not the lower of, whichever is lower, historical versus current, which is what we do today. What obviously happened several years ago is that the interconnection rates were artificially set low to assist the new entrants. Probably bad economics then. Certainly it's time to change that and actually in the Government's statement there is language that says "in the initial years". I think we are well beyond the initial years, it is time for a change.

This is kind of small but if you could read it, it would be looking at per minute interconnection charges. This is Hong Kong down here and this is origination and determination, almost the same thing. The point is that the charging in Hong Kong is one half or one fourth what it is in other markets. So it tells you—and most of these other markets are using some variation of LRAIC— that we are either three or four times more efficient than anybody or we are not recovering our relevant costs. I can assure you that it is the latter and not the former. Here is another aspect of wholesale pricing in Hong Kong. This is unbundled local loop. I have taken out the numbers to protect the innocent. But on either monthly rental, which is the recurring charge, or on the installation charges you can again see that Hong Kong is way below other markets. Again, a subsidy flow from PCCW's residential users to the business customers of our competitors. Here is the relationship between what you do with interconnection pricing and what happens in the market. Because you have not created the right make/buy signals you will get service-led rather than facilities-based competition.

No-one should be surprised at this, this is the reality of the rates that exist in the market. If you are going to have service-led where people are not building out, the first place they are going to focus when they build or otherwise is central business districts and larger users that are business customers. The two Ns have built only limited local networks, again, in the central business districts. One of our competitors reaches 100 buildings after five or six years. If you are thinking about an infrastructure competition reaching 100 buildings or 200 buildings when there are 30,000 in Hong Kong, is not a sign of a successful policy. If you have built only 100 kilometres of fibre, that cannot be an indication of a successful policy. Why? Because the make/buy point is in the wrong place.

The way forward. Clearly, what needs to be done and OFTA has a consultation outstanding on revising TA statements 4, 5, 6, 7 and 8 -- is to set interconnection charges at points where PCCW will recover all of its relevant costs. That certainly means, as those charts showed, that those rates will need to rise. As those rates rise, it sends the correct incentive to actually build. When they build there might actually be real benefits in terms of users having choice, other than resale choice, of multiple carriers outside of central business districts. So fixed interconnection, *switch to class tariffs, which is what we have done in our recent filing on unbundled local loops for broadband*, and in fact make it clear that unbundled local loop will go away. *Sunset unbundled local loops*, whether it is one or two years from now it does not matter, but it needs to be done otherwise you will never have infrastructure competition, you will not get the benefits

that you have been promised. So in addition to sending the right make/buy signal, you have got to promote infrastructure competition by having investment commitments in the new licences. This is really belts and braces. Fix interconnection, get commitments. If you do both you will have infrastructure competition. Thank you.

Interconnection & Competition

Stuart Chiron
13 November 2001

Key Factors to Consider

- 
- **Policy context**
 - **Benefits of infrastructure competition**
 - **Interconnection charging principles**
 - **International benchmarks**
 - **Current state of competition**

Policy Context

“The fundamental objective in specifying a particular pricing principle is to encourage network competition among carriers. With this in mind, the Government agrees that the relevant principles would need to be reviewed, in due course, when the new entrants have attained a greater market share”

(Government's response to the Consumer Council Paper, September 1996)

Policy Context (Cont.)

“With the licensing of additional local wireline-based fixed telecommunications This should attract more **investment in network infrastructure**”

(Anthony Wong, DGT, OFTA press release 16 October 2001)

“As a matter of policy, the Government wishes to ensure that the liberalised environment encourages **investment in information infrastructure widely throughout Hong Kong**”

(The 1998 Review of Fixed Telecommunications - A Consultation Paper, ITBB)

Policy Context (Cont.)

“The Government is aware that long term commitments to substantial and continued investments are required to establish a local FTNS network of a wide enough coverage to provide adequate competition with the dominant FTNS operator ... If further FTNS licences are issued, the licensees should be required to enter into commitments to provide networks which are comparable to the best of the three new FTNS licensees”

(The 1998 Review of Fixed Telecommunications - A Considered View, ITBB)

Benefits of Promoting Independent Infrastructure Competition

Consumers

- ⇒ Greater choice
- ⇒ Enhanced service innovation
- ⇒ Better service quality
- ⇒ Faster speed to market
- ⇒ Ensures affordable rates
- ⇒ Separate networks



Benefits of Promoting Independent Infrastructure Competition (Cont.)

Economy

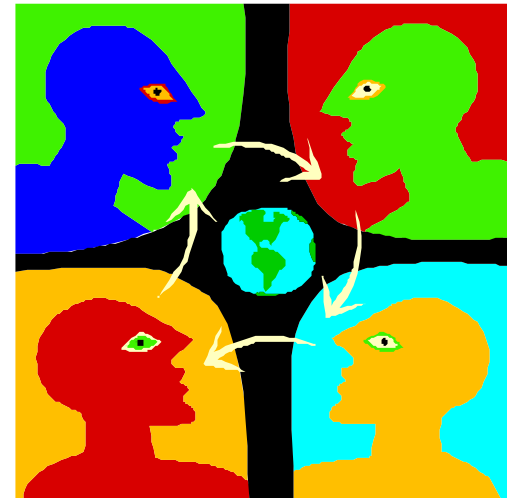
- ⇒ Growth of telecoms industry
- ⇒ Overall economic driver
- ⇒ Hong Kong as telecoms hub
- ⇒ Infrastructure investment
- ⇒ Job creation
- ⇒ Network redundancy



Benefits of Promoting Independent Infrastructure Competition (Cont.)

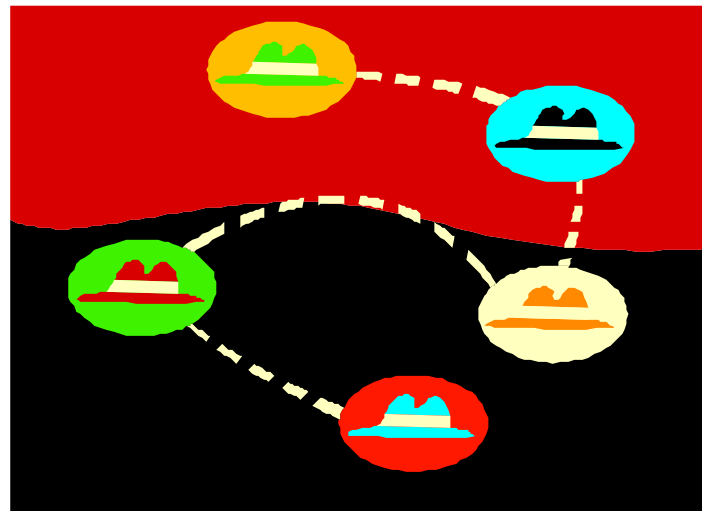
Regulation

- ⇒ Correct make/ buy signals (end subsidy flows from PCCW residential customers to 2Ns)
- ⇒ Commitments for new licensees
- ⇒ Symmetrical regulation of Wharf (unbundling, interconnection, discrimination)
- ⇒ Light handed regulation
- ⇒ Fewer interconnection disputes



Benefits of Promoting Independent Infrastructure Competition (Cont.)

Conclusion: **Interconnection regime impacts infrastructure investment & competition**



Interconnection Charging Principles

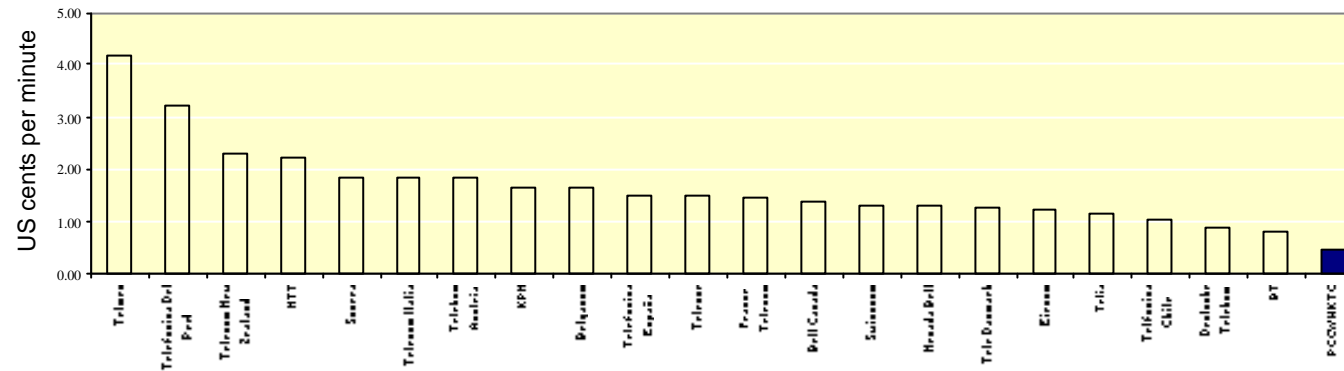
- Appropriate make/buy price signals to encourage infrastructure competition (or at least not encourage resale competition)
- The LRAIC standard
- What's wrong with OFTA's cost standard ?
 - ⇒ LRAIC or FDC ?
 - ⇒ Recovery of shared costs between access & conveyance networks
 - ⇒ Relevant costs (e.g. network conditioning)
 - ⇒ Depreciation schedules
 - ⇒ Historical v. current replacement cost

The proof of subsidy ⇒ International benchmarks

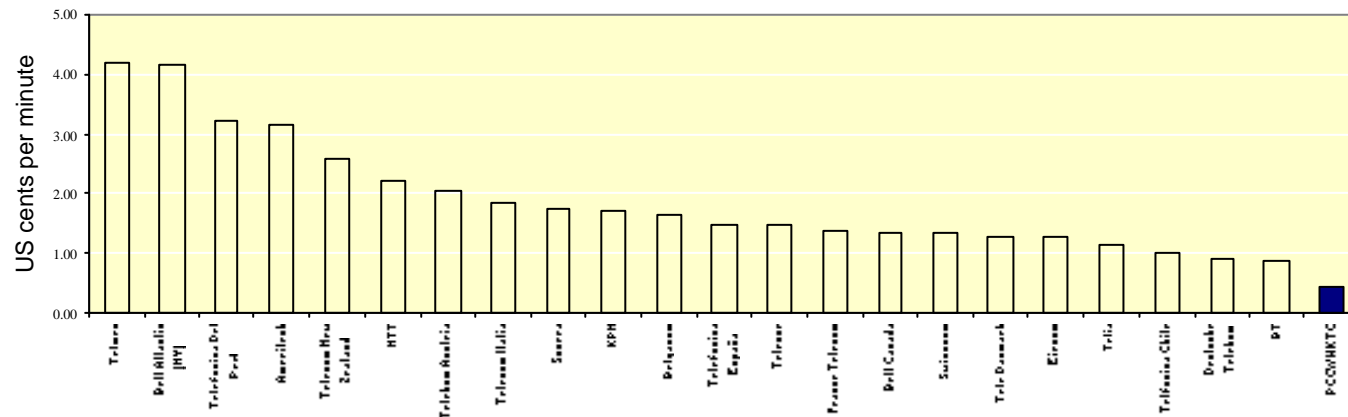


International Benchmarks

Per Minute Wholesale Interconnect Charges
(Termination on Fixed Network)

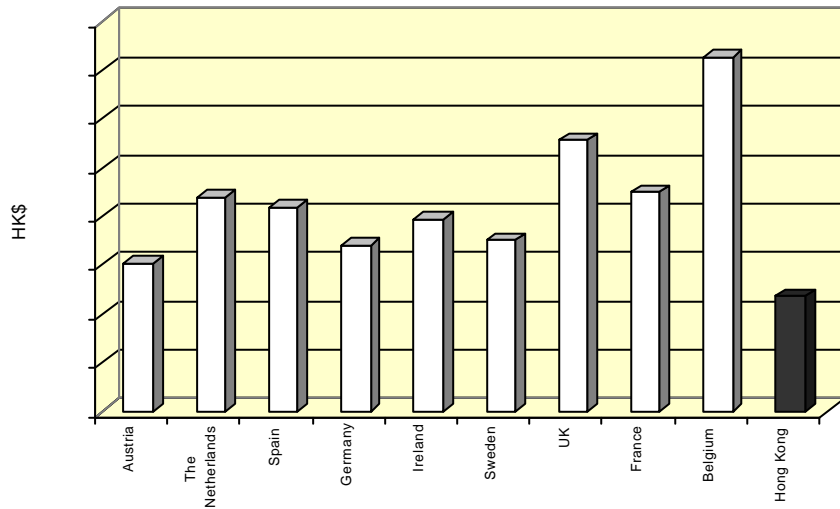


Per Minute Wholesale Interconnect Charges
(Origination from Fixed Network)

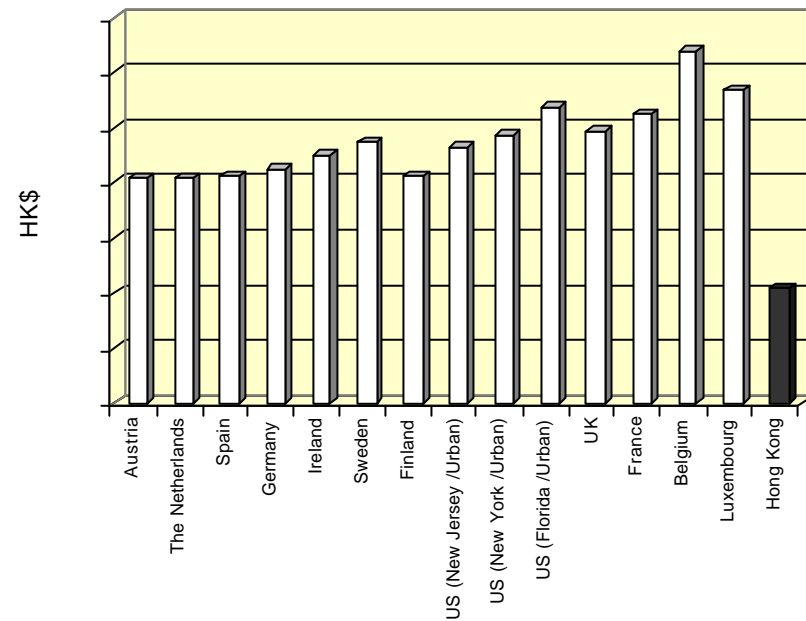


International Benchmarks (Cont.)

Unbundled Wholesale Local Loop Prices - Installation Charges (One Off)



Unbundled Wholesale Local Loop Prices - Monthly Rental



Current State of Competition

The direct result of existing interconnection price structure and price levels:

- 🎬 Service-led rather than facilities-based
- 🎬 Targeted on business customers in the CBD
- 🎬 2Ns have built only limited local networks
- 🎬 Limited choice for residential consumers

Problem: Too little infrastructure investment due to wrong make/buy signals

Solution: Fix make/buy issue & operators will build



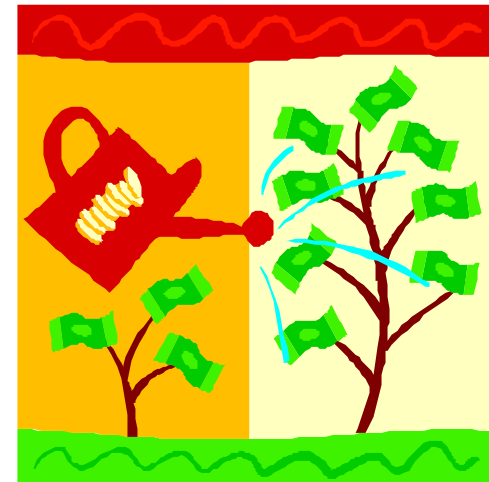
Way Forward

- 🎬 Interconnection charging principles & levels that:
 - ⇒ Recover relevant costs
 - ⇒ Are consistent with international benchmarks
 - ⇒ Do not require PCCW to subsidise competitors
- 🎬 Revision of LRAIC and migration to FDC
- 🎬 Class tariffs to be encouraged
- 🎬 Sunset of Unbundled Local Loops



Way Forward (Cont.)

- 🎬 Promote infrastructure investment by sending the correct make/buy signals and having a 2-tiered system
- 🎬 Promote infrastructure competition by having investment commitments
- 🎬 Coordinate interconnection & liberalisation policies to promote infrastructure investments





Thank You

Peter Lovelock: Are there any questions?

Participant: I was talking about John's earlier comment that seemed to keep the potential model from a fixed (inaudible). The current configuration in Hong Kong is that the mobile B end charges its customer for that call and the A end is unable to charge for the call because there is no local call charging effectively, so if you were to have that model I can see in terms of the traffic balance would you not have to remove the B end mobile charging and then instate a retail charge at the A end for fixed and then you would have sender keeps and collects and there is a balance between the retail and wholesale levels of the traffic.

John Ure: There is inevitably an asymmetry because, clearly, if you moved all the way to a sender keeps all then as far as the HKTC end, or the A end, the sending end from the fixed, they would have to either decide to introduce call charging of their own or to rebalance the local rental and the mobile operators obviously have a call charging system. If you had a call charging system at one end and a fixed rental system at the other end there is obviously going to be a potential for an arbitrage, assuming that people do not—even if people have both a fixed and a mobile phone, there would obviously be arbitrage opportunities there for people, kind of reverse calling if you like. But then that exists at the moment with call-forwarding. I don't think that would be a big problem. I think the key issue is whether or not the local loop rebalancing, at least in theory, could be accepted by the regulator as the way forward, then the actual decision to rebalance would be taken by the fixed line operator in light of competitive conditions.

Stuart Chiron: John, on that point it seems to be that you are giving the audience two choices: one, increased local rates almost 100 per cent, plus introduce user sensitive charges; or get interconnection pricing right. I think politically it is going to be a lot easier to get interconnection prices right. No-one is thinking seriously about raising rates to \$200 a month next January—that is politically a non-starter—once you do the easy thing and the economically correct thing and focus on getting interconnection pricing right.

John Ure: Getting interconnection right would, in my opinion, be shifting to a LRAIC-based interconnection charging and that would then leave the problem about whether or not you pile the fixed indirect costs on to a local loop.

Stuart Chiron: Actually, OFTA's recent paper mentioned that there would be a time when the percentages were there or actually interconnection traffic was such a high percentage that FDC would be the proper way to go. If your data is right at 50 per cent, I think we are there. I think OFTA's number in the paper indicated I think that around 10 was the current percentage and the inference was when it got significantly above that, and certainly 50 would be significantly above that, the time would be ripe to go to FDC. Even on those interconnection charts, even if you went up to FDC it is likely that interconnection in Hong Kong would still be cheaper than almost every other market in the world.

John Ure: I don't know if there are any mobile operators here who would like to comment on that rather than have a dialogue between myself. At the back.

Participant: As mentioned earlier in the discussion, the main focal point of your argument was this build versus buy decision. Do you then agree with John's point that in the build versus buy decision, really, on the mobile interconnection you put your argument around and you should go from an FDC to a LRAIC basically?

Stuart Chiron: The question came through kind of garbled so I will just take a guess at it. I think your argument might have more force if local calling was built on a user sensitive basis. But since it is not and the mobile carriers get revenue whether they are being called from or called to, and the fixed network licensees get no additional revenue from the consumer from calls going to or from, I don't think your argument is going to work.

Peter Lovelock: Do you want to try again with this one?

Stuart Chiron: Try it again, I will give you a different answer.

John Ure: In that case would you be happy living with a calling party phase?

Stuart Chiron: I would rather get interconnection right. When I say interconnection, it is not just per minute, it is everything else related to it. It is unbundled local loop pricing and also about getting the two Ns to adopt a committed capacity. So that when they order interconnection link, they ordered them without paying anything. Just paying usage over 15 years means that they put their money where their orders are, put their money where their forecasts are. If you want capacity, order it. We will pay for it, we will provision it. But this other methodology is uniquely unsuitable for a competitive environment.

Agnes Tan: Can I respond to what Stuart has just said. I think there should not be any assumption that it would be easier politically to fix the interconnection charges. It will have an impact on the level of competition. If you just fix the interconnection charges without doing anything on the retail side, a few years later there may not be anyone left to compete with you, and that would not be fun. The other thing is, there should not be any assumption that only the new entrant will be requesting for interconnection. You have an obligation, the incumbent operator also has the obligation to ask for interconnection. So, equally, you have at some stage for certain type of traffic, you are going to have to ask for interconnection capacity from the new entrant. I seem to be hearing that only one side will be requesting for interconnection capacity but that is not the case, that should not be the case.

Stuart Chiron: We would certainly accept a committed capacity arrangement in both directions, but we are particularly interested in seeing if the fourth is going to do any more unbundling and end the discrimination that you engage in.

Participant: I have a question about infrastructure competition, it is either for Agnes or Stuart or both. If the buildings are practically full, it is hard to have infrastructure competition when there is no space for new infrastructure, so if the incumbent is losing market share how do we get his old stuff out of there to make room for the new infrastructure?

Agnes Tan: They do not remove them, they leave them there in case the customer decides to turn back to them. Type II interconnections were introduced in Hong Kong because in Hong Kong, geographically, it is very congested and in buildings it is very congested. In the early days we avoided type II interconnections until 1999 I think. But we had a lot of difficulties in getting access into the buildings involving our network, digging up roads and when we get to the buildings and then getting into the building, we had bottlenecks at the way in, and we had bottlenecks at the equipment room, it is full, there is no more space. And when you resolve the equipment room, then you have problem with the riser, there is no space for another set of wiring. Then when you sort out the vertical part then you have a problem with the horizontal part. There are bottlenecks everywhere.

Participant: Then how can you have infrastructure competition?

Agnes Tan: That is why you have the local loop unbundling. You lease the infrastructure that is there.

Stuart Chiron: You can build into the basements and then interconnect there and that is what a lot of interconnection is, you come into the basement, you don't have to do unbundled local loop. It is interesting to hear Agnes's arguments because we have a lot of problems getting into new buildings. One of the reasons is that our carrier competitors, the two Ns, are all affiliated with building companies and property developers. I can assure you that in the last several years we have had a lot of trouble getting into buildings owned and run by Wharf or New World or even Hutchison. We do not control those buildings and actually that is one of the areas of discrimination that needs to be addressed.

Participant: I am Simon Chan of the Hong Kong Telecom User Group. I have a question for Agnes and also for Stuart. Since the liberalisation, if you speak on behalf of the telecom users from a business angle, business user angle, we certainly have benefits already, we have seen IDD or even now international circuit dropping down to 50 per cent or even 90 per cent in the case of IDD traffic. But the issue on the other end is that the consumer may not have options to choose for their local fixed network, the residential line. That's why the 1N companies still have over 90 per cent. So my questions to both of you—actually, just now we have seen a theme or argument of whether we want to promote service competition versus facilities competition. My question for Agnes is, PCCW have been saying that we have to get it right, the buy/build signal, so if we promote too much on the local loop unbundling and interconnection then the new entrants do not want to build facility, then there is only one choice, still one choice to the residential customers. My question is, how do you see that the actual build out of the

circuits to have alternate choices for residential customers. In order to balance with that I would ask Stuart on the other side that Agnes had a chart on broadband interconnection, type II interconnection with \$198 being the full band with charges. Would you please comment on those charges because I see that the broadband service is growing at a very rapid rate and the customer needs that service and if that doesn't happen then there is no interconnection.

Agnes Tan: I will deal with the first part of the question since it is a long question. I think you want to know whether residential customers will have a choice. Yes, the residential growth has been slow and there is a reason for that. As you know, the local line rental was heavily subsidized by the external services until the framework agreement in 1998 which paved the way for progressive local rental rebalancing. That has then made the business model more viable and we had in fact extensively rolled out residential services. My colleague, Tony Cheung, who is Director of Consumer Market, he has very, very aggressive targets imposed on him. He has got to meet his target. His target for next year will be triple or even more. So, yes, we have great ambition to roll out residential service. Perhaps you can talk to Tony and tell him where you live and we can promise you that a choice will be available to you shortly.

Stuart Chiron: Unless you live in a primarily residential area in which case they will not serve you.

Agnes Tan: It depends on the co-location exchange. We are aggressively rolling out type II interconnections so we also have aggressive plans for locating at your various exchanges for next year.

Stuart Chiron: I think the short answer is going to be, they have total control over where they build and don't build and where they seek co-location and not seek co-location. If they opt to serve primarily business areas, one, I don't think anybody should be surprised, that is where the money is. If you are surprised then push them further to build further, or to do type II, although I personally think type II ought to be a second choice and should be sunsetted after a short period. The broadband on unbundled local loop terror. I actually defer that to some of my colleagues who do wholesale pricing. I can tell you though that there are a multiple set of products and retail prices and wholesale prices and so I'm not sure that this effort actually represents the norm. For example, there is a CRS service that is wholesale at \$175, it is an asymmetrical end to end service whereas unbundled local loop is a different type of service, it is symmetrical, so it is going to give you more capacity both upstream and downstream. Also the pricing mechanism is different because one is based on OFTA's broadband statement and another one is based on another methodology. There are a lot of nuances when you get into specific prices, but I would actually take the question back and maybe get you a better answer on that.

Yip Hak-Kwong: I would like to make a short comment. It is a very interesting discussion, I think it can go on for a long time between two operators. I just want to look from a consumer perspective, an ordinary person like me. Why should we bother about

the argument between two operators on a technology which was installed yesterday? Should we not be looking forward to new technology? If a new company is trying to give me service, give me the new technology. You don't need to go through the local loop, you don't need to go through the fixed line. In the last forum there were a number of speakers, there are a number of alternatives, wireless access through electric lines. The companies should not be held to provide services to ordinary consumers, they should provide a service with updated technology that can attract our purchases.

Peter Lovelock: Stuart, a follow-on question. The presentation you are giving, you are saying the policy framework as it stands now is not encouraging infrastructure build, it's leading towards service competition rather than facilities competition; right?

Stuart Chiron: Actually, no. I think the Government policy, when you look back at the statements, does indeed favour very much and endorse very much infrastructure competition. I think what has happened is that you have essentially gotten resale competition because the commitments have been meagre and the make/buy point has been set in the wrong place and that is why you have resale competition and you do not have the benefits of infrastructure competition. It is not infrastructure competition for the sake of infrastructure competition, it is for the sake of benefits to users, I think that is what the policy has been missing. The policy is right, the implementation is off, it is time to fix.

Peter Lovelock: Where does that leave us in transitioning to broadband build? Where is the encouragement in the policy framework for building out new expensive broadband networks?

Stuart Chiron: If carriers do not have the incentive to invest because interconnection charges are wrong, or make/buy is wrong, there will not be an incentive. I think that is the problem, that is what Dr Yip's chart shows, you lost for one reason or another the incentive to invest.

Peter Lovelock: The framework now has PCCW out there as the incumbent with a good chunk of the market for fixed line and the incentive is not there in the right place to drive the three competitors to build out; is there a lack of incentive on PCCW as well to build and invest in the new broadband networks?

Stuart Chiron: We invest, I think if I have got the number right, about \$5 billion a year, and we have got a network that covers everybody in Hong Kong essentially. So we will invest and continue to invest in the network of narrow and broadband.

Peter Lovelock: So even if the framework has got the price points or the incentive points wrong, PCCW is the incumbent still out there pushing Hong Kong ahead on the cutting edge of build technology.

Stuart Chiron: If the incentives are not right—

Peter Lovelock: We can rest on your good nature to keep building even if the incentives are wrong?

Stuart Chiron: You know you can't. I think companies react to the economic realities in the marketplace and if the incentives are wrong the investment will not follow.

M.H.Au from OFTA. This afternoon we seem to be getting some conflicting messages. We have got an academic who is advocating the use of long run incremental cost, moving from FDC to long run incremental cost for calculating mobile to fixed interconnection charges. We have the dominant operator advocating the use of moving from LRAIC to fully distributed cost. We are talking about conversions, we should be giving mobile networks and fixed networks the same treatment. How can there be two apparently conflicting directions which the academic and the dominant operator ask OFTA to follow? I wish to comment, we must get our terminology correct. Long run average incremental cost, normally, we are talking about forward looking costs. And fully distributed cost normally is calculated from historical cost, cost from the operator's accounts. So I don't know whether or not PCCW is really advocating the use of historical cost in a calculation of interconnection charges. There is a perception that somehow because FDC include the indirect fixed cost, it includes more components so FDC must be higher than the long run average incremental cost, but that may not necessarily be the case because in Hong Kong one of the cost components is land. So if you are looking at current cost then the forward looking cost, long run average incremental cost, maybe higher than the fully distributed cost and that is actually pointed out by Agnes in her presentation in the interconnection charges based on forward looking costs. Right now it is actually higher than the fully distributed cost based on historical cost. So I do not know whether or not John is advocating the use of long run average incremental cost for the mobile network operator when they want reduction in interconnection charges. If we adopt LRAIC the interconnection charge may increase. And for Stuart, if we adopt FAC, do not expect that the interconnection charges will be higher, it might even be lower.

John Ure: I think, ideally, we should move to a regime which really reflects the costs that new operators building up networks are going to incur. My main concern is actually making a distinction between core network costs and local loop costs. The issue of core network costs is not really a build/buy decision because if you don't have a call network, either fixed or mobile, you don't have a business. Whereas access to the customer is a build/buy decision. That's really what we are talking about when we are talking about facilities versus services. I actually have sympathy with the view that there should be sunsets. I have believed that there should be a phase in and a phase out of regime which helps, initially, new entrants and then puts everybody on an even footing, so I have sympathy with that view. For that reason, forgetting the issue of property prices for the moment, in principle for the local loop I would have no problem with moving from LRAIC to an FDC. But for core network costs I believe that LRAIC is the economically efficient cost basis, but even more so in the case of peering networks, a sender keeps all in which case you overcome that problem.

Participant: I would have thought that it is the other way around. For the local loops it should be a build or buy decision because the choice is between (inaudible) but in the case of mobile interconnection charges, the mobile operators have no choice but to use the network of the fixed operators, therefore, it is not a build or buy decision, it is a compensation of the fixed network operators and therefore compensation should be based on the accounting book value. So FDC is quite logical in the case of mobile interconnection charges and LRAIC is quite logical for the type II local loop interconnection charges, a build/buy decision?

John Ure: The thing is complicated because of the property thing, whether you use historical or current. But in principle, the movement from a LRAIC to an FDC normally will increase the interconnection charge, under normal circumstances. So if you used current cost for property then that would certainly increase the FDC charge. That would conform to the idea that new entrants eventually have to pay a higher fee and therefore there is an incentive to build. For the same reason in the case of the call network it is not a build/buy decision, so I think we are saying the same thing here. Ideally, just to take up your point that the mobile operators have to use the fixed wire networks, the fixed wire networks also have to use the mobile networks because the balance of traffic is, as I understand it, pretty close. So mobile network operators add as much value to fixed wire subscribers as fixed wire line subscribers add to mobile. I think that should be reflected logically in the interconnection regime.

Peter Lovelock: Agnes, do you want to comment?

Agnes Tan: In the case of the mobile, I think you were talking about the mobile operators have no choice, they have to buy the service from the fixed line operators. That would be for the interconnection between the cellular. I think that is what you are talking about. For the call to call; right. I thought, you know, there is a difference in terms of buying the lines. Then you have the mobile interconnection charge, you pay for the line rental plus then the usage charge. Whereas in the fixed operators' interconnection we don't have to buy service as such from the other operator, from the mobile operators, it is purely for the passing of the calls.

Stuart Chiron: I am less inclined to get into the academic discussion of whether FDC or LRAIC is going to give you the higher or the lower. I am more concerned about ultimately the correct make/buy signals be given, that is the key. It is a range of numbers and it is not the current numbers, at least in the interconnection regime now between fixed and fix. Even on that chart, if you put in the PNETS charge it is still well below where other markets are.

Peter Lovelock: I can see more questions emerging just as the fight gets going. I think we have to break it there for coffee.

John Ure: Since there is another event starting at 6 o'clock we have to clear out fairly promptly at 5.30. May I suggest that we keep the coffee break to 20 minutes.
[Conference breaks at 4.00 pm] [Conference resumes at 4.20 pm]

Session Two

John Ure: We have exactly one hour. We started a bit late because of the weather and people coming a bit late so we are on a tight rein for this one. For those of you who came in late, unfortunately, Linus Cheung cannot be here with us today, so I am substituting for him. We will have three speakers on the panel. The first is Andrew Lih, who is the Principal Investigator of the Interactive Design Laboratory at the University of Columbia. Andrew will then be followed by Richard Fawcett from Bird & Bird, he will be talking about the European regulatory trends. Finally, Michael Reede from Paul Weiss Rifkind will be talking about Asia Pacific and particularly I think the Australian model. Then we will open that up and I will also ask both Agnes and Stuart to be available for additional questions that might come their way. With out further ado, Andrew.

Andrew Lih: Thank you for having me here today. I guarantee that even though the slides look like I will take an hour and a half, I will be very quick. If I go past 20 minutes please shout at me and I will stop. Good afternoon, my name is Andrew Lih, and as John said, I am with the Interactive Design Lab. I am pleased to be addressing you today about some of the things that the US has been dealing with in our era of telecom deregulation. Some of the major events in our telecom past include dates like 1984 and 1996, a new one will be important for the telecom industry for years to come. Of course, I am referring to the **tragedy of September 11 in New York City**. It was an event that stunned Americans and people in the free world alike but the reason why 9/11 is so important from the viewpoint of telecom and interactivity is because it exposed the vulnerability of our telecom infrastructure in one of the most advanced areas in the world, our financial district. Oddly enough, I was in Hong Kong on 9/11 at Chek Lap Kok airport when the twin towers were hit. **Phone calls attempted to the US were futile, but after hopping on the Internet, instant messaging and email brought me immediately in touch with colleagues and contacts throughout the United States.** Web sites sprung up immediately to track survivors and mobilise. Many telecom services failed on 9/11. But others surprised us. As you will see in my talk, we can learn a lot about the outcomes of telecom reform and regulation by analysing the economy of the last two years and the recent events in New York.

Just a quick introduction; the IDL at Columbia University was established in 1999 to perform research in interactive technologies for content delivery. A whole range of technologies and policy issues have greatly affected the adoption of interactive content in the United States. Whether it's a 3G rollout, adoption of broadband access or competitive local loop access, they have all had a profound effect on the uptake of interactive content in the United States. Telecom reform in the US has its roots back all the way to 1934, but of late, the **1984 breakup of the AT&T** system into Regional Bell Operating Companies and the AT&T interexchange carrier has created the landscape of today. **The 1996 Act** was what provided an opportunity for competitive local access carriers. So if you indulge me I will just quickly go through the US system in case folks are not too aware of it. **It is useful to quickly understand how the US telecom policy is shaped and maintained.** The Congress in the US, either the House or the Senate, initiates bills and refines the details of policies and brings them up for full vote. If the bill is passed into law, it is then enforced by the FCC or the Public Utility Commissions

of each state. It is up to the regulators to interpret the law and institute specific guidelines in order to enforce the law. Over time, the judiciary—that is the lower courts—and, ultimately, the Superior Court or the Supreme Court determine whether these laws are constitutional or whether they are implemented using least restrictive methods. In addition, in the case of anti-trust concerns, the Department of Justice or the Attorneys General of individual states can take the companies to court. So obviously there are a lot of pluses and minuses of this system. There are a lot of actors in this scheme, each handling a different aspect of the total body of telecom policy.

The benefit of such an arrangement are the two things prevalent throughout the US system: distribution of powers and checks and balances. The disadvantage is that Congress, made up largely of lawyers—apologies to lawyers here—initiates the bills while economists, engineers and experts exist on the sidelines. Because the system is consensus driven it is often tough to keep up with technologies that move so quickly. Perhaps one reason I was so impressed by the speed at which Hong Kong gets its regulation done, for better or for worse.

Breakup of the Baby Bells. In 1984, the major Ma Bell breakup turned AT&T into a long distance company and restricted RBOCs, or Regional Bell Operating Companies, to intraLATA service. Basically, not allowing them to do long distance type of carriage in the United States. RBOCs were given geographic domains based on population density and historical regional affinities, as you can see here with the original seven Baby Bells. **1996 was a year of big changes. As a way to promote competition it removed many of the barriers to cross-ownership of cable, telecom and content.** These areas have always been separated in the US deregulation. Most people predicted telecom companies would get into video services. Cable companies would offer telephony, and so on. Another big change was that **RBOCs had opportunity to coveted long-distance market, and competitors would be able to access the UNEs, or unbundled network elements of incumbents.** But RBOCs would have to qualify for the privilege of entering the long-distance market and UNEs would be set through regulated prices. So, in effect, the Telecom Act of 1996 had a lot of extra contingencies, so-called sticks and carrots. That had cynics calling the 1996 Act “deregulation through more regulation”. We will see more about this. Similar to Mr Yip’s slide, you have to be careful not to seek more competitors as being equal to competition. Opening up incumbent UNEs spawned a lot of competitors in the US in a very short time and in the early days proponents pointed to this as a sign of success. But we must be careful not to confuse these two things. After all, if people are simply re-selling the same widgets, or in this case, network elements, it is not really a competitive space. You have to ask yourself whether new facilities and service offerings are being provided, silly or not. Well, even if those who believe that more competitors indicated a healthy environment, they did not have a compelling case, if we see these types of mergers that have been happening in the past ten years. In the years following the Telecom Act of 1996 there have been a spate of mergers the size of which we have never seen before in the United States. In fact, the intended outcome of the Act of 1996 that the RBOCs would compete against each other in each other’s markets, failed to materialize because they in fact re-merged themselves. It is evident that this was not the desired effect of the bill back in 96 but in fact a loosening of

ownership rules allowed this consolidation to happen. It has happened to the point where **the four RBOCs claim a larger chunk of the market share than ever. In 1996 you can see that they claimed just less than 50 per cent, today the top four RBOCs claim over 80 per cent of the local market.**

The part of the 1996 Telecom Act that has reconfigured the current landscape is the unbundling provision specifically at “Any technically feasible point within a carrier’s network”, and using a forward-looking pricing scheme on these unbundled elements. The pricing of these elements has been especially difficult given the nature of the technology and the sunk costs for the incumbent. As we shall see, there are risks of overpricing and underpricing these UNEs, as we discussed today. The TELRIC pricing scheme has many critics in the United States, including the most respected thinkers in this area such as Economides and Kahn. I am not an economist though and I will not debate the intricacies of the alternative costing methods as we have more qualified people here today to do that.

But I will provide insight into the qualitative issues and the consequences of unbundling schemes and arrangements. One of these consequences involves the CLEC to ILEC interaction. CLECs and interexchange carriers started to provide services such as DSL and residential voice using unbundled ILEC local loops. Customer service was notoriously bad as the responsibility for interfaces between network elements became a problem. Whether inadvertent or not, there was also the phenomenon of slamming which moved customers from one IXC to another, or from one ISP to another without the permission of the customers. ILECs were also found to be guilty of poaching customers from CLECs by offering similar services with cheaper packages. The culmination of all these effects led to a perceived reliability problem with the CLECs.

Despite these setbacks, CLECs made steadily increasing movements into the local line market. CLECs reported about 8.5 per cent of the approximately 194 million nationwide local telephone lines in service to end-end customers in the year 2000 compared to 8.3 million at the end of 1999. Only 35 per cent of these lines were served over CLEC-built facilities, however. About 60 per cent of these lines served medium to large businesses. If you look at the numbers by state, New York has been an exemplar of local competition, both in absolute numbers and in the share of all local loops which are provided by competitive carriers. It has been held up as an example for other states to follow. Remember that this is the stick in order to get the carrot, being rewarded the prize of carrying long distance by the incumbent in New York. The reward for the New York environment was given to **Verizon**, the incumbent, and the super-RBOC was granted permission in 1999 to carry long-distance traffic, the first RBOC to ever achieve that status. **SBC** in Texas, Kansas and Oklahoma was also granted permission because it was deemed to have a competitive environment, but to date those are the only two to be approved and a half other dozen cases have been rejected.

As you can see from this map, carriers with blue or purple represent zip codes where there is a healthy competitive CLEC market. Both Texas and New York have large swaths of blue, indicating seven or more CLECs offering this type of service. But that is

where most of the good news ends for the CLECs. The CLEC market in the US is generally suffering, funding is disappearing and some major CLECs that provided residential and business DSL and voice services have failed recently in the United States. Most of the markets in the United States only have one choice, the incumbent. Only one of every four markets has an environment with three or more choices. So you can see that monopoly still rules in many parts of the United States here. There are multiple reasons why there are CLEC woes. Many point to the lack of cooperation from ILECs and all same road blocks ILECs put up that hampered their efforts. However, most experts agree that there was much or more blame to the dot-com environment in which they lived. With irrationally high mounts of investment and a user base that shriveled with each dot-com failure, there was a lot of bad business planning. Remember, this was a market where folks thought that free DSL service would be a viable business in the United States.

What can we learn from the landscape that we have set up for ourselves in the United States? A grim reminder of how fragile it can all be was delivered on September 11th of this year. 9/11 was an interesting proving ground, mainly to illustrate how much was wrong in our telecom infrastructure. Since that day there have been numerous conferences and symposia to discuss this. Many hosted at Columbia University. **The most notable failure was that of 140 West Street, and I am sure my colleagues here in the telecom world have read much about its significance in New York. To recap, roughly 30 per cent of Manhattan's phone lines were somehow routed via this single building in Manhattan, adjacent to the World Trade Centre.** It is shown here in the picture with the webbing around it. Because of its proximity to the financial district and so much of the downtown area, many companies were relying on its five ESS switches and enormous density of fiber and copper lines. To make a long story short, it was only partially destroyed by the World Trade Centre debris, but it was operationally knocked out on 9/11. Today, as we speak, many folks served by the telecom housed in that building are still without service. Cellular systems were largely unusable on that day as well because of the enormous volume of calls and routing through this building. **What did work was the Internet and testimonials abound to the value of instant messaging as a method of contact.** Email at Columbia's servers, for example, doubled on the days after the attack. Surprisingly, the RIM network stayed operational and running and provided a way for Wall Street folks who carry these email devices around to contact each other. **To get back up quickly, companies used point-to-point high bandwidth systems such as Terabeam or wireless Ethernet.**

So what kind of lessons can we learn from this? The knockout of 140 West Street teaches us some valuable lessons. Verizon was criticised for putting so many of its network eggs in one basket, allowing it to be a single point of failure for so many of these Fortune 500 companies. But it was not just Verizon customers that were affected, but all the CLECs that were colocated and used Verizon UNEs as well. Colocating all this equipment in one building makes economic sense but makes for bad redundancy. **But to be fair to Verizon, how do you build the cost for redundancy into a pricing scheme like TELRIC, which does not have redundancy in mind but instead hypothetical pricing for normal day-to-day operation?** There must be incentives for firms to spread

out risk and implement fault-tolerant architectures. And fixing cost methods with one set of assumptions is in conflict with the goal of redundancy. So it is a very hard problem. Some believe there is quite a glut of fibre and long-haul capability, but there has been a reluctance to build new facilities for the local loop in the United States. As seen before, 35 per cent of 8.5 per cent— which is the number of builds that the CLECs have undertaken themselves—**means only 3 per cent of all local loops in the US were new builds by CLECs.** So clearly we need an environment that drives competition and innovation in this local loop. One way is to push for development of alternatives for the wired local loop which can come from these many different types of sources. **Cable telephony in the US was supposed to be one of the fruits of the Telecom Act 1996 but it has largely been a failure as we can see only 1.3 million customers nationwide use this service today.** One reason is that standalone HFC systems are expensive investments for these cable carriers, as they must be run in parallel with separate cable modem hardware. Also, the FCC has very stringent requirements for allowing lines to be sold as primary since they must adhere to strict emergency 911 guidelines. The new **DOCSIS 1.1 standard** provides a solution as this becomes more prevalent. Another deterrent is that cable modem service is quite expensive. When I returned to New York, my monthly cable bill would have gone up to \$44.95 a month, which is fairly expensive compared to other Asian markets here. In general, this now unregulated market of cable is one that has seen prices increase steadily over the years to the dismay of subscribers. **Fixed wireless has a chance in the US but the major players have either gone bankrupt or backed out of this whole market.** A recent decision by the FCC has confused the market even more, since they have allowed licensees of fixed wireless to now use it for mobile applications. Just an indication of how much this market has failed in the United States.

Perhaps the brightest star in the US telecom market is the wireless mobile market. It currently has vigorous competition nationwide and no doubt we still suffer from a confusion of many technical standards in the US, but it is quickly converging on two, CDMA and, finally for you folks, GSM. **GPRS service is rolling out today but 3G is nowhere to be seen. The US cannot even find their frequency bands to allocate for it.** Given the poor demand for 3G in Europe though, US foot dragging may not be such a bad thing. The recent lift on caps for market ownership now threatens the very competitive environment the US has in wireless, as you might have read in the last week. One reason why wireless may not be such a good replacement for local loop in the near term is because landlines in the US are extremely cheap, even by worldwide standards, and wireless is relatively expensive. Because we do not have calling party pays, mobile users pay for every incoming call and historically have been reluctant to answer their phones or to even switch them on. Up until recently the ratio of outgoing to incoming calls has been 80 to 20. People would simply switch off their phones when not calling all out from their handsets. I am sure in Asia where phones ring everywhere, including in hospital operating rooms, people find this habit quite shocking.

An outsider and dark horse are technologies such as **Wireless Ethernet** which utilizes Internet-based packet technology rather than circuit-switched telephony. Some have proposed using this as a last-mile solution. It may not be a perfect technology for this

application, however, it is the kind of thinking about alternatives to tradition telephony that merits discussion in promoting competition in this local loop.

Before I conclude I thought it would be interesting to show what our neighbour to the north has done in the area of deregulation. Other people have mentioned here, Canada like The Netherlands is an interesting study. Their facilities-based competition is very different than other folks who use UNEs as a basis for market entry. Canada does not dissect the network and unbundle every element of the network. The CRTC has limited essential facilities to largely information sources, such as databases and directory listings. But the CRTC can order unbundling in certain areas. In the cases where it does, the competition for ILECs is generally higher than US type TELRIC models, but there is a limit to how long the element can be leased. This provides an immediate leg up for competitive carriers but also provides a sunset provision to make sure that they do not entirely rely on the incumbents. This has the potential to increase innovation by forcing CLECs into building new facilities and not relying on the incumbent local loops forever. The future of the Canadian system is being debated as we speak since next year marks the end of the five-year periods for some CLECs. In general, they have CLEC penetration rates similar to the US at the same point in time, but the futures can be very different because of long-term unbundling rules.

As for the US, there will continue to be a shakeout in the CLEC space. Despite that, analysts predict the surviving CLECs will have a fair amount of success, garnering 30 per cent of the local loop voice market by 2010. The buildout of new facilities will be limited by the reliance on unbundled network elements and given the current economic slump, the alternatives I have presented will play a role in the market. Cable telephony may take off given the new standards that guarantee voice traffic performance. Wireless is becoming cheaper every month with free long distance and free minutes given out by almost every carrier today in the United States. The US has a very healthy long-distance market, while in the local market, competitors are still looking for market entry. Deregulating something so entrenched as the local loop is hard. It is still a learning process that needs to be fine-tuned over time. The right alterations must take into account the effect of other sectors such as the competitive cellular market and the not so competitive cable market in the United States.

So I look forward to discussing some of these issues with you this afternoon. Thank you.

US Telecom Policy Looking Towards an Interactive Age

November 13, 2001

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November 13, 2001

Overview

- US Telecom roots
- Modern policy
- Status of competition
- Learning from crisis
- Alternatives
- Future

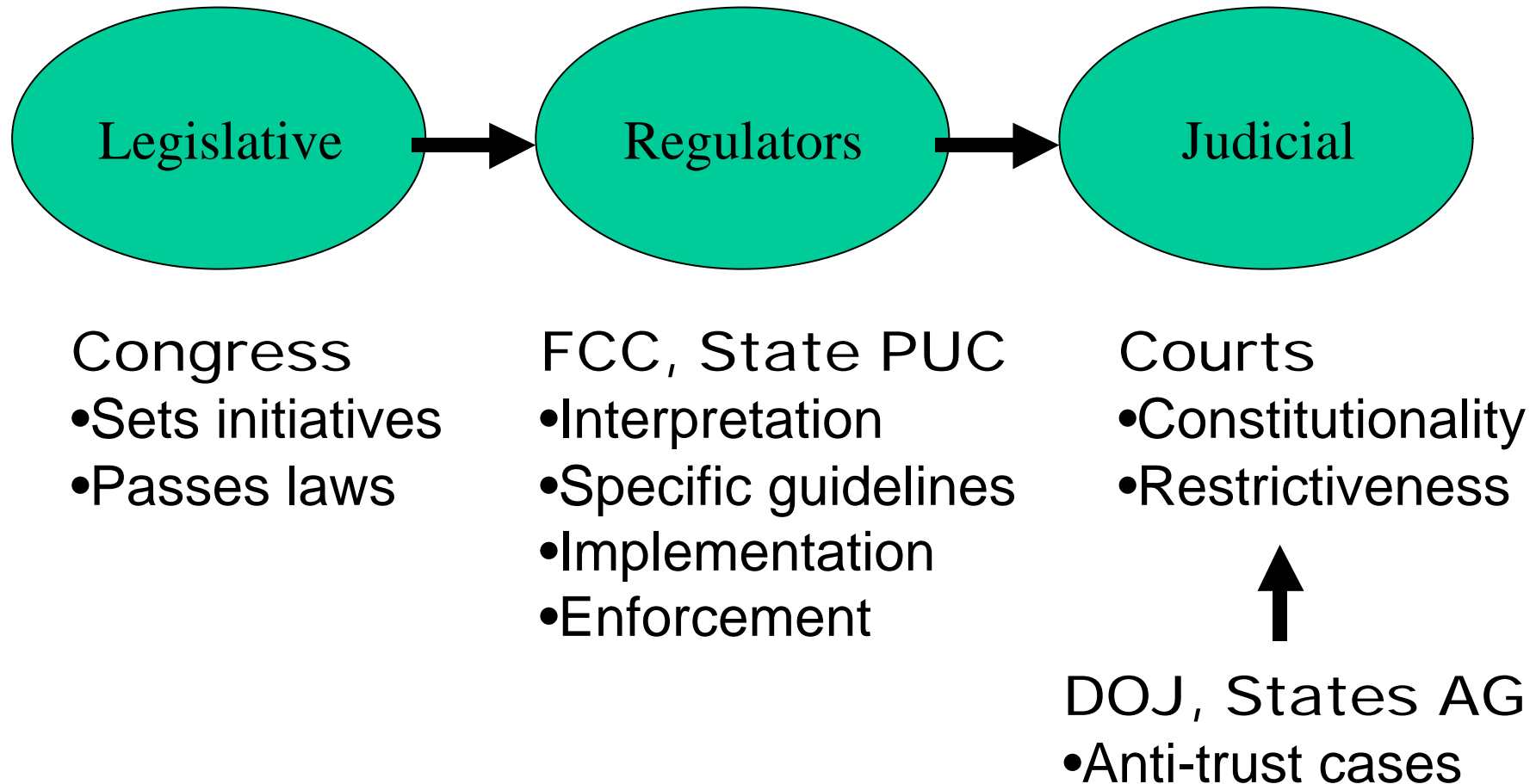
Interactive Design Lab

- Research in multimedia interaction methods
- Content for broadband, wireless and interactive television
- Implications of policies and business

US Telecom origins

- 1934 Telecom Act
- 1984 court ordered breakup (MFJ)
- 1996 Telecom Act

How US System Works



US System Evaluation



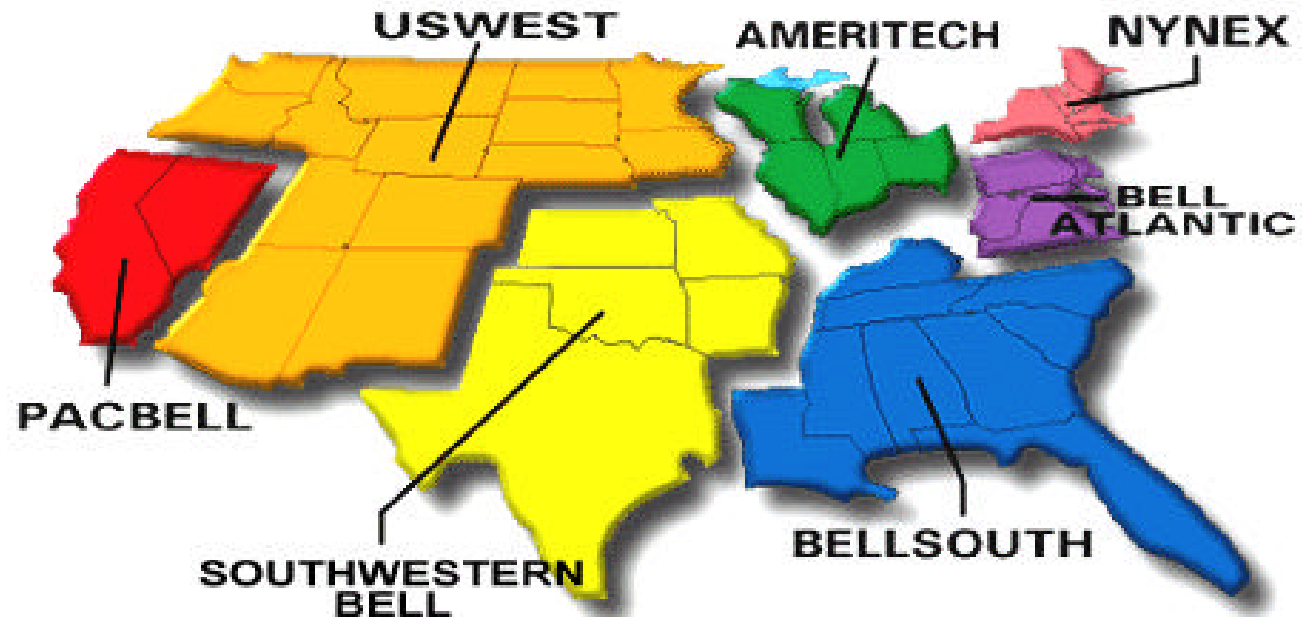
- Plusses
 - Distribution of powers
 - Checks and balances
- Minuses
 - Initiated not by economists, engineers or experts
 - Influence of special interests
 - Not quick to act
 - State and federal regulators conflict

Breakup of Baby Bells

- AT&T restricted to long distance market
- Regional Bell operating companies (RBOCs) restricted to intraLATA



US RBOCs (circa 1984)



November 13, 2001

Telecom Act of 1996

- Goal: promote more competition
- Removed barriers on cross-ownership and market entry
- ILECs must provide access to unbundled network elements
- RBOCs entry to long-distance services

Competitors Competition

- Regulators often point to number of competitors
 - An illusion of full competition
 - No good if underlying network elements are simply being resold
 - Are there new facilities being built?

Large telecom mergers

- PacBell/SouthWestern Bell \$16 billion
- Bell Atlantic/NYNEX \$25 billion
- MCI/WorldCom \$37 billion
- US West/Qwest \$47 billion
- BellAtlantic/GTE \$53 billion
- SBC/Ameritech \$62 billion
- Sprint/MCI (called off) \$110 billion

RBOC Consolidation

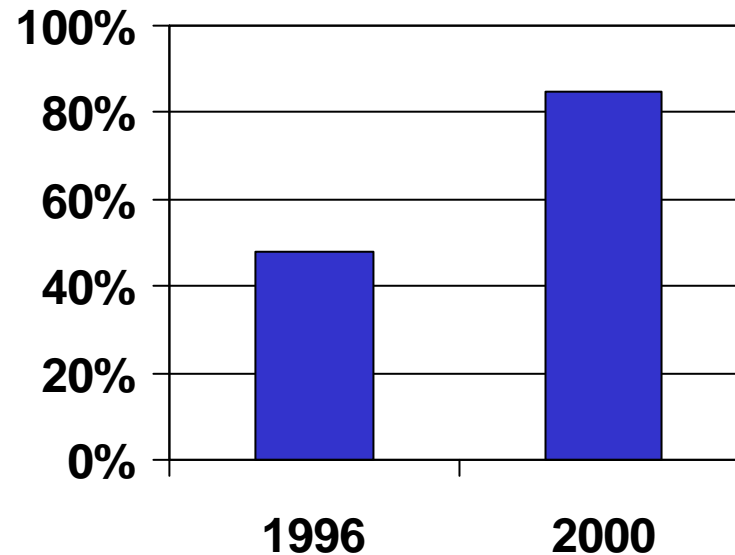


- Seven Bells become four:
 - **Verizon** = NYNEX + GTE + Bell Atlantic
 - **SWB** = SWB + PacBell + Ameritech
 - **Qwest** = Qwest + US West
 - **BellSouth**

Head-to-head vs. Mergers

- Companies have chosen M&A over direct competition
- Consolidation has led to concentration

Market Share of the Top Four US ILECs



Local Unbundling and Pricing



- Consequence of Telecom Act 1996
- Access “At any technically feasible point within the carrier's network.”
- UNE pricing using TELRIC

Evaluation of Unbundling

- TELRIC – Total Element LRIC
 - Seen as inadequate pricing model
 - Many notable critics (Kahn, Economides)
 - Being argued before Supreme Court
- Access to “every” UNE

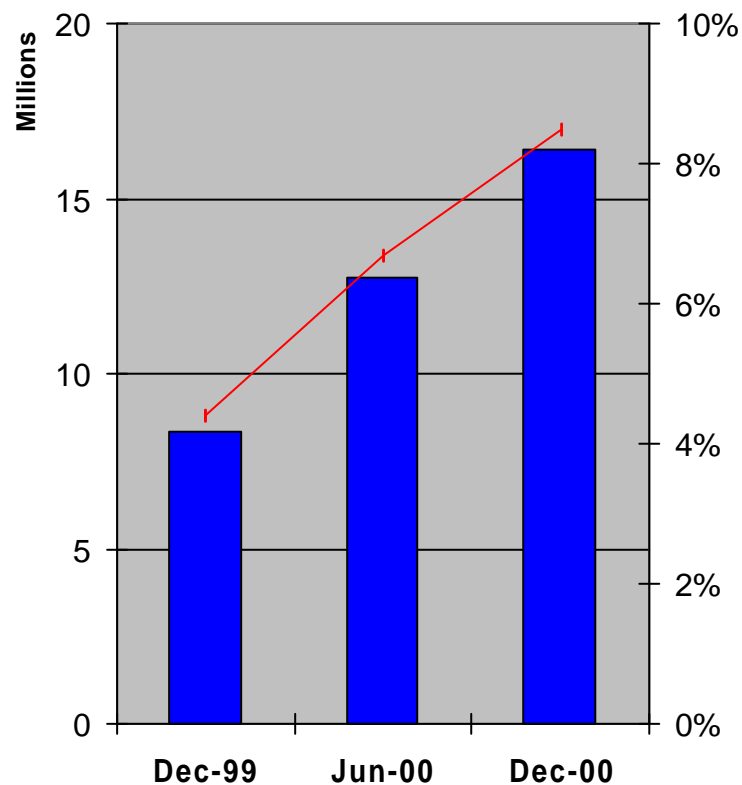
Evaluation of Unbundling

- ILECs inadequately assisting CLECs
 - Slow to provision loops
 - Low customer approval ratings
 - Slamming
 - DSL market problems

Association for Local Telecom Services, Hearing Before the House Telecommunications Subcommittee, May 25, 2000

November 13, 2001

CLEC Share of US Market



- CLECs reported 8.5% of 194 million local lines in 2000
 - 35% of these over their own local loop
 - 60% to med/large businesses

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Source: FCC, Common Carrier Bureau, May 2001

CLEC Statistics by State

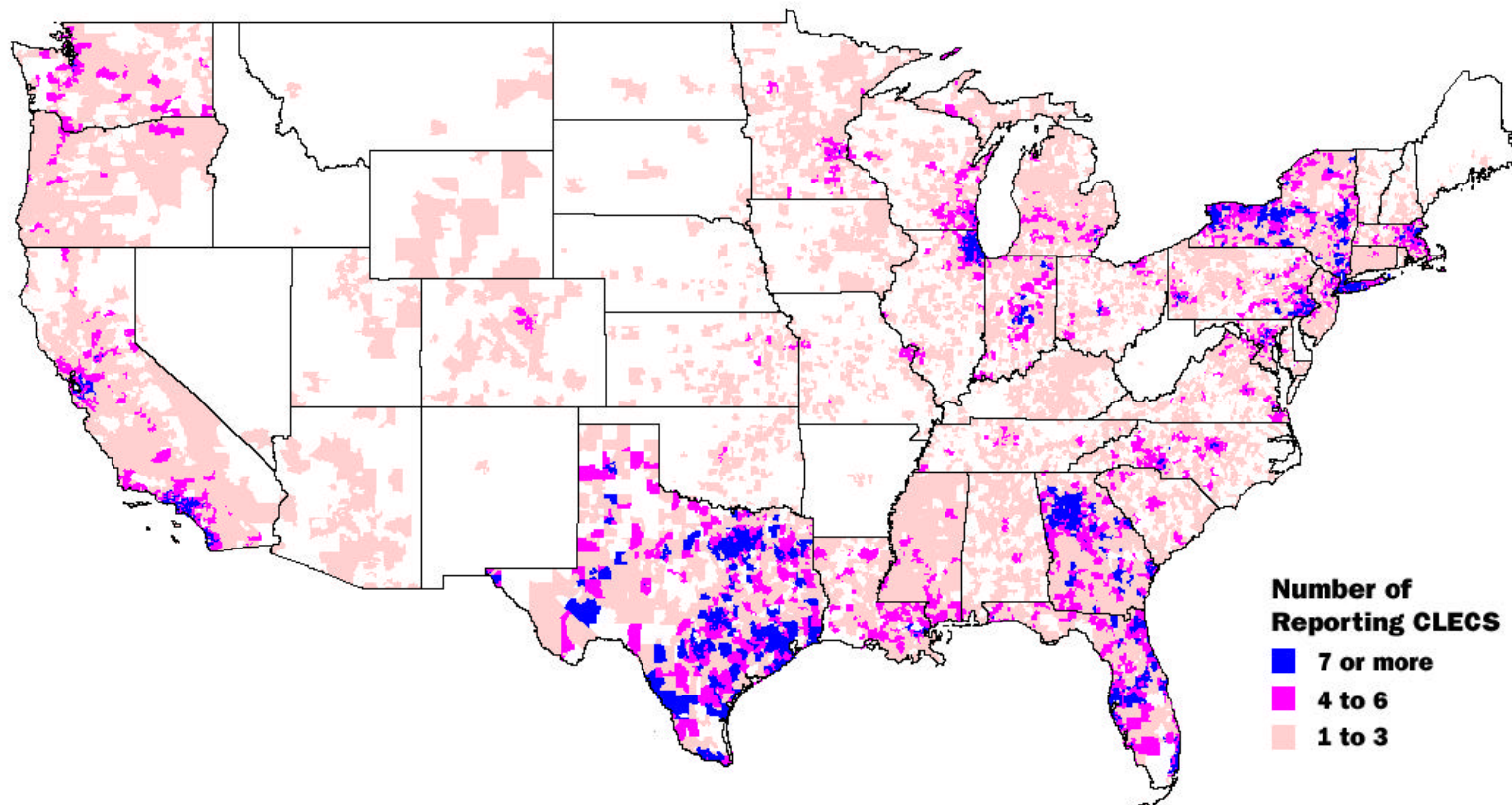
- Most CLEC lines
 - New York (2.8 mil)
 - Texas (1.6 mil)
 - California (1.5 mil)
 - Florida (1.0 mil)
- Highest Share
 - New York (20%)
 - Minnesota (15%)
 - Louisiana (14%)
 - Kansas (13%)
 - Texas (12%)
 - Massachusetts (11%)

Healthy CLEC Markets



- New York and Texas
 - RBOCs Verizon and SBC can enter interLATA long distance
 - Only ones to meet FCC guidelines

CLECs in the US (Dec 2000)



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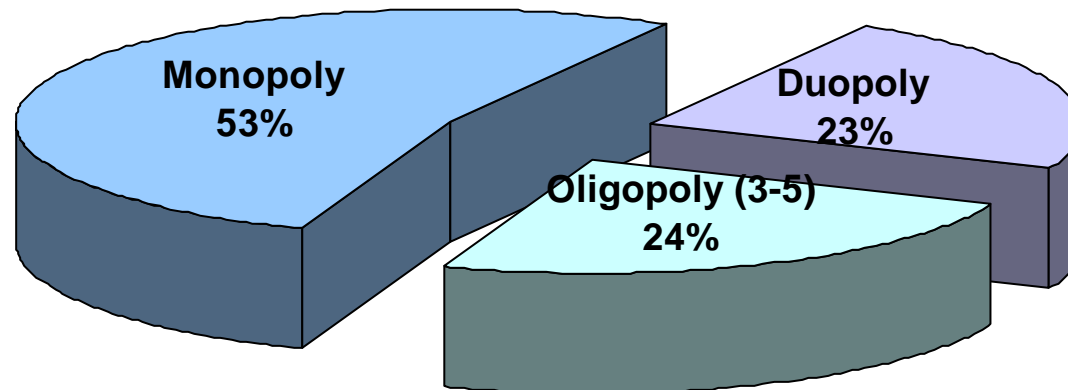
Source: FCC, Common Carrier Bureau, May 2001

Many CLECs in Trouble

- Private funding disappearing
 - 1999: \$7.43 billion
 - 2000: \$1.63 billion
- Recent failures
 - ICG
 - Teligent
 - Northpoint
 - CTC
 - Focal

CLEC Shares

MONOPOLY STILL PREVALENT Concentration of US Local Communication Markets (2000)



Source: FCC, Local Telephone Competition: Status as of June 30, 2000 Industry Analysis Division

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CLEC Problems

- Customers disappeared
 - Dot-com collapse
 - Waning demand
 - Overspending
- Customer service
 - Hampered by RBOC coordination

Evaluation

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Consequences of 9/11



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- Failures
 - Lack of redundancy
 - 140 West Street handled 30% of all Manhattan lines
 - SONET failures
 - Cellular failed/overloaded

What Worked on 9/11

- Internet access held strong
 - Instant messaging, email
- Blackberry RIM network
 - Email, peer-to-peer
- Point-to-point microwave, laser, RF
 - Terabeam, 802.11b



Lessons of 9/11

- Incentivize building redundancy
- Design new fault-tolerant architectures
- Spread out risk and equipment
 - Heavily concentrated network equipment
 - Relying on ILEC UNEs can be risky

Considerations as of 9/11

- Inexpensive UNEs affect new builds
- Only 3% of local loops in US were new builds by CLECs
- Increase innovation for local loop solutions

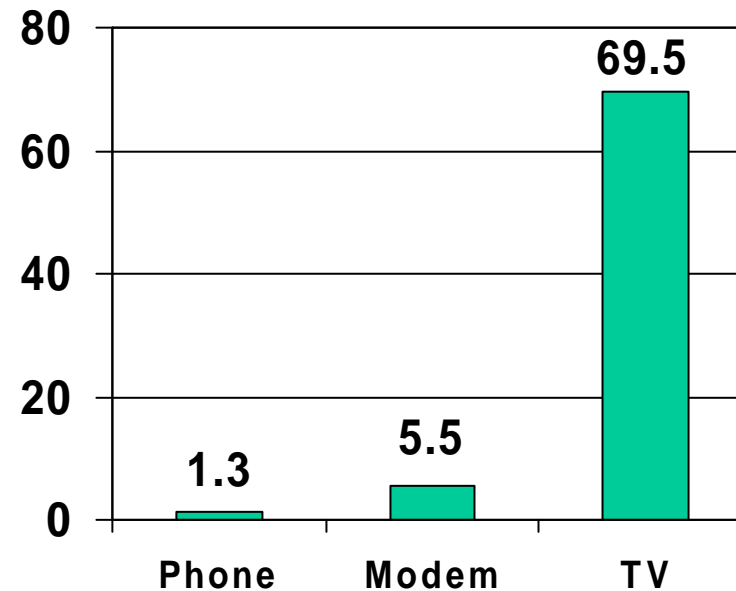
Local Loop Alternatives

- Cable
- Fixed wireless
- Mobile wireless
- Wireless LAN

Cable Telephony/Modem

- Few voice customers
- Standalone HFC systems expensive
- DOCSIS 1.1
 - QoS, toll call quality
 - Meets 911 standards
- Expensive data service
 - \$50/month (going up!)

US Cable Services (2001)
in Millions of Households



Source: NCTA

Fixed Wireless

- Wireless Local Loop and LMDS
 - Stalled effort in US
- Companies
 - Teligent, Winstar bankrupt
 - Sprint FON no new accounts
 - AT&T abandoning market (\$1.3 billion charge)



Mobile Wireless

- Most competitive telecom sector
 - Up to six operators/region
 - CDMA predominant
 - GSM rising (Cingular, AT&T, Voicestream)
- Recent developments
 - 2.5G (GPRS)
 - 3G stalled
 - Market caps lifted (11/2001)

Mobile Wireless

- Wireless/wired very different usage
- Landlines very cheap
 - Flat rate monthly plans (unlimited calling)
- Wireless relatively expensive
 - Mobile party pays airtime (not CPP)
 - Many users shut off phone, outgoing only
 - Roughly five times more expensive

Wireless LAN

- Wireless Ethernet
 - 802.11b (11 Mbps), 802.11a (54 Mbps)
 - Popular with corporations
 - Inexpensive, ubiquitous
- Minuses
 - Limited range
 - Incomplete security
 - Billing tough



Canadian Deregulation

- Deregulation in 1997
- Facilities-based access
- No overall mandatory unbundling (ie. Not every technically feasible point)
- Essential facilities limited to:
 - Telephone number database
 - Directory listings
 - Local loop lines in high cost areas (rural)

Canadian Unbundling

- CRTC can order unbundling and leasing
- Only in certain areas (urban, high density)
- Price: actual incremental cost + 25%
- Time limit of 5 years

Canadian Results

- Immediate access for competitors
- “Fair” compensation for incumbents
- Encourages building new facilities
- Increases innovation
- Still limited new facilities buildout

US Projections

- CLECs woes will continue in near term
- CLECs will have 30% of local loop voice market by 2010
- Buildout of new facilities limited

Conclusions

- Many long distance choices
- Local market dominated by RBOCs
 - Assistance with UNEs lacking
- Cellular growth strong
- Cable prices continue to climb
- Encourage innovation

John Ure: Thank you very much, Andrew. Now we are going to get a European view from Richard and it will be interesting to see how far Europe is following the United States' focus on unbundling local loop elements which might not indeed be the way to go.

Richard Fawcett: Thank you very much, John. Thank you all this afternoon. As John said, I have been asked to talk about some of the key themes and policies within the European Community. Because of time constraints and also because of the nature of how policy emanates from the communities and is then implemented in national member states, my comments are going to be fairly high level this afternoon. So I'm going to give a very brief overview of some of the key themes and policy objectives, I will then look briefly at some of the means that are being used to try to implement and achieve those policy objectives.

I have just listed on this slide two of the principal directives and the regulation on unbundled access. The two directives that I have referred to here, they are key to this but they are not yet in force, they are still being negotiated between the member states but they do show where the policy is going. The regulation on unbundled access has come into force. Lastly, I will mention one thing which is on the horizon policy-wise. So what are the key themes and the policy objectives? First of all, themes. Unlike Hong Kong, **the European Community has a general body of competition rules which apply across all industry sectors**, regardless of what the market, what the sector is. It's only in markets which are not fully competitive that there is an overlay of sector specific regulation and we are going to see a little bit later that some markets within the telecom sector are within that and do have specific regulation. The next theme at the moment is that **the directives that are coming out at the moment are focusing on the regulation of electronic communications networks and services. No longer are there distinctions between telephony, broadcasting, Internet.** The thinking and the attempt at the moment is to cover all of these networks and services, they are referred to as electronic communications networks and services. So the regulation that is emanating at the moment is covering all of those.

The next theme, technology neutrality, that is very familiar to us in Hong Kong, as will a number of these themes and policy objectives be. The next point is quite interesting. **There is a move away from individual licencing towards general authorizations.** The thinking is that you will be able to run a network, provide a service unless it is prohibited. So you don't need to go through an administrative decision-making process to allow you to operate a network or run a service. Unless that particular service or network is prohibited, you will be able to provide it. Exactly how that's going to work is not yet clear. The thinking is probably that it will be along the lines of a notification by the operator or some form of registration. The only area where specific rules and licencing may be necessary is where there are scarce resources, typically spectrum and numbering. The last point on this slide just relates to **significant market power**, which is the expression which is used to determine whether or not an operator falls within the regulation or not. I am going to talk a little bit more about that later.

So very briefly, what are the general objectives of regulation? To foster a dynamic marketplace with sustainable competition at the network and the services levelling. To provide incentives for investment. To guarantee user choice and to maintain public policy objectives in areas such as broadcasting and consumer protection. What means are being used or proposed for achieving these policy objectives? The first guiding principle which I think is relevant to this afternoon's discussions is that in the competitive market the interconnection of and access to networks should be agreed on the basis of commercial negotiation. Obviously, we are all very well aware that at this stage in the game there are still factors which are constraining competitiveness in the market. As I have explained, under European policy, where there is not competitiveness or not full competition then there is this additional overlay of sector specific regulation required. So what does the interconnection directive say? What does it do? First of all, it lays down the criteria for regulatory intervention. So there is a system for identifying economic markets on the basis of economic principles. Once those markets have been identified there is then a process of analysis to establish whether or not there is effective competition in those markets. Secondly, the interconnection directive lists a number of maximum obligations that a national regulatory authority can impose on operators. Thirdly, it identifies those undertakings which the NRA can impose obligations on. Generally speaking, although not exclusively as we will see, those are operators which have been notified as having significant market power. So what is meant by significant market power? It's a sort of three prong definition essentially. **Significant market power will be deemed if an undertaking, either individually, that is the first prong, or jointly with others, that is the second prong, enjoys a position of economic strength affording it the power to behave to an appreciable extent independently of competitors, customers and, ultimately, consumers. This second part of the definition is essentially the third prong. Where an undertaking has significant market power on a specific market it may also be deemed to have significant market power on a closely related market where the links between the two markets are such as to allow market power held in one market to be leveraged into another market.** So similar concepts here to dominant position that we have in Hong Kong. The analysis to decide whether or not to notify any particular operator as having significant market power is similar to the process in Hong Kong for assessing dominance. So that's the first stage of trying to achieve the policy objectives.

The next stage is to see what obligations can be imposed on any operator that has been notified as having significant market power. **The first obligation is in respect to transparency**, and this relates to the publication of information such as technical specifications, network characteristics, terms and conditions for supply, use, pricing, those sorts of issues. **The second obligation is in respect of non-discrimination.** The obligation is to provide competitors with the same facilities that the operator provides to itself with the same conditions and with the same time scales. It applies in particular to the rollout of new services in the local access network. It applies to access to unbundled local loops, availability of colocation space, provision of leased transmission capacity for access to colocation, ordering, provisioning, quality and maintenance procedures. The next obligation relates to accounting separation. This is the exception to the rule that

these obligations can only be imposed on operators with significant market power. **The national regulatory authority can impose the accounting separation obligation on a vertically integrated undertaking whether or not it has been notified as having significant market power.** The requirement can be to make the wholesale and internal transfer prices transparent where the undertaking provides input facilities that are essential to other service providers and itself competes at the same time in the same downstream market. The regulator in any national member state can publish information, such information as would contribute to an open and competitive market. The next obligation relates to access to and the use of specific network facilities. **The regulator can require an operator with SMP to grant access to and use of specific facilities and/or associated services.** Now this expressly does extend to operational support systems, and I think it is likely also to extend to the provision of information under the associated services heading. So quite a wide obligation that potentially, depending on how it is actually implemented. The regulator is likely to impose its obligation particularly where it considers that a denial of access would hinder the emergence of a sustainable competitive market at the retail level or would not be in the end users' interest.

Price controls. I think the last of the obligations. It includes obligations for cost orientation of prices for the provision of specific types of interconnection or network access where the potential lack of effective competition means that the operator may be able to either sustain prices at an excessively high level, or apply a price squeeze to the detriment of end users. The regulator must take into account the investment made by the operator and also the risks involved with that investment. Any pricing methodology that the regulator mandates must serve to promote efficiency and sustainable competition and must also maximise consumer benefits. The basis of pricing can be decided on in detail by each national regulatory authority, but **a forward looking approach based on current costs is what the European Commission expects will foster fair and sustainable competition.** So that's all on what has been published to date.

As I said at the beginning, I just wanted to mention one possible issue that is on the horizon in the European Community at the moment. This is **the suggestion of structural separation at the local loop level. The thinking has been prompted by the almost universal failure to date of local loop unbundling.** It has been mandated since the beginning of this year in every European Community country. To date there has been pitifully low interest or take-up and there are all sorts of reasons for that. Under this suggestion, the incumbent in each jurisdiction would be forced to divest itself of its local loop assets and they would be operated or managed by a different entity and its absolutely unclear at this stage how that model would work and there are lots of different ideas for it. All that I can say at this stage is that it is an open secret within Europe that the European Commission is actively looking at ways to use the competition rules that it has to try and require structural separation at the local loop. Whether or not it will happen remains to be seen but it is there as a potential issue. Thank you very much.

John Ure: Thank you, Richard. Clearly, there is a difference in philosophy between Europe and America, Europe being much more proactive in this area. Again, the apparent failure of local loop unbundling, does it have implications for the way that we should go here?

Michael Reede: Good afternoon. Unlike John's suggestion earlier on, I will not be talking necessarily about Australia but looking at that as one comparable market. I will try and actually wrap up some of the thoughts from the earlier presentations and put it in a regional context because this region, in particular, has a very advanced grasp of regulation. I think we need to acknowledge that Hong Kong and some of the countries in the region actually lead the world in terms of the deregulatory initiatives that they have taken. We do have a certain regulatory genealogy that has operated over the past ten years. If you look across at these speeches given this afternoon you will see that really began with the modified final judgment in the US followed by Mercury's efforts which were very slow to try and move BT in the UK. From that learning, that very slow process, initially we actually developed a very modern sense of regulation, issues such as unbundling, interconnection charging, pricing methodologies and the portability of numbers. Hong Kong is one of the first regions to actually be able to grasp that regulatory learning, at just the right phase of development.

Australia moved earlier and made mistakes in terms of the way it introduced interconnection charges, for example. So we do have in this particular region a strange genealogy where Australia set the pace following some of the European and US examples. It was followed some four or five years later by Hong Kong who took the very best out of that system, including half the regulatory staff who came here to Hong Kong. Singapore followed on from Hong Kong. You will see a lot of very distinct similarities between Hong Kong and Singapore. Singapore might not recognize this and the IDA would not acknowledge it, but in fact it is largely a copy of significant parts of the Hong Kong system. So I would like to step back and go to a very high level to begin with and move down to a very detailed level.

Too often, interconnection charges really focus at the outset on costing models and economic concepts such as productive efficiencies, and you lose sight of the objectives. I think it is very important in looking at interconnection in Hong Kong and elsewhere to, firstly, ask yourself the question: What are our objectives? Then to actually measure performance against those objectives. Secondly, to look at some of the comparables in the region and around the world and to measure their success against their objectives. That is the best place to begin the analysis and then move down to the application of theory. Beginning with very, very basic regulation 101, the regulation is meant to be a transitory phase. It really is meant to be a surrogate for competition but to actually instill that competition so it can replace itself. The most difficult choice a regulator must make is actually to make that regulator redundant. That is a very important choice. It has to be made at some point in that regulatory spectrum, but regulation must evolve with the market. There is a terrible problem you find with static regulation, that once a theory has been adopted it is regarded as a uniform theory. We find that issue in Hong Kong and elsewhere in relation to broadband interconnection. You have a tendency to adopt

narrowband interconnection price modelling, apply it to very new technologies and networks, potentially to 3G. It is certainly not certain that that theory would hold. It is a matter of choosing the methodology for the particular application. This is a graph which describes at an extremely high level the implementation of regulation. You will see on the vertical axis the level of regulation, and the level in time across the bottom. This is how most markets actually move, the low level of regulation and then deregulation involves a very high level of regulation at the outset. Then it moves down that curve towards the left until it becomes an ongoing level of regulation, really focussed purely on competition analysis, anti-trust analysis and some level of access or interconnection regulation. Hong Kong, I would suggest, is actually off the edge of that curve, it is flat-lining at the end of that curve having achieved a very, very competitive domestic market. We have seen that in terms of price squeezes in various sectors. I would suggest that the regulatory environment here still exists back up the curve somewhat, so there is a regulatory lag as regulation is actually catching up with the market because the market here moves very fast. There is a very narrow time horizon in a small territory with very intensive use of telecommunications capacity. Whereas it can take up ideas and technologies very, very quickly it is very hard to maintain pace.

Regulatory trends have actually had an impact on the **liberalization paper that OFTA** has released here in Hong Kong. As we have seen elsewhere, firstly, **service providers will begin to seek carrier rights**. We have in Hong Kong a lot of service providers that already have carrier rights with very low access charges under the inter-PNETS tariffs. There is a running distinction between carriers and service providers. Again, we will see that progressively with the next phase, what I will call fourth phase liberalization in Hong Kong. Service providers look and sound like carriers without networks. We have an eroding distinction between mobile and fixed, not necessarily in fixed mobile convergence but certainly in terms of use. We see mobile networks who are actually surpassing fixed line networks in terms of the number of subscribers and almost in terms of traffic. We see again that very definite trend from sectorial regulation to competition regulation. That has been a fact that Hong Kong has been a little slow to accept. If you look, for example, at Australia there was a very distinct cut-off point in 1997, five years after the inception of real competition or the outset of competition where they drew that line and moved all the activities to a competition regulator and actually disposed of sectorial regulation in the very technology precise sense. So each phase of this deregulation involves another game theory analysis and we are seeing that now in Hong Kong.

It is also important to look at the historical context of regulation, particularly in Hong Kong, because we have got to a certain point and we have to understand why that is. I think, John, you had touched upon the very early phase of how we actually got to having a tariff charge for mobile and ISPs here in Hong Kong. But all regulation is created in that historical context and specialist regulators are applying economic theory, but they do not apply that theory in a vacuum. It is applied in the context of politics and they have to be somewhat pragmatic as to how they apply that theory. So ideally we would have greenfields regulation on a greenfields open competitive approach. That would normally involve competition, taking hold in the international sector, then to long distance and

finally to the domestic or the customer access network sector. Interconnection would focus on customer access and efficient buy/build. We have pricing regulation and progressively more competition analysis. Hong Kong is not such a greenfield site. In that respect it is quite unlike the comparables you will find in the UK, also in Canada, in large parts of the US, in Australia and in Singapore. There was a great economic aberration in Hong Kong, which was international exclusivity. Also the model that Hong Kong chose to begin competition with, three entrants in a very small area. So that was quite a bold move, very different. They chose not to have one strong new entrant in a duopoly situation and went for a more complex oligopoly. Now the different theories that you can apply; somebody suggested duopolies lead to duopoly pricing, you have high retail prices. Others would suggest that in fact an incumbent far better off with three weaker entrants and with one very strong entrant. Hong Kong chose the three. Around the ideal deregulatory model there was a need to actually build various adjuncts to address international exclusivity. This was not present anywhere else. It was not present in Australia, Singapore, the US or the UK. Also, here there was no long-distance market, which is another source of revenue. Here there were no local call charges, unlike Australia where they were capped, also capped in Singapore. So it was a very different model to begin that deregulation. The entire model was therefore quite pragmatically premised on margins between retail and wholesale. This was all revolving around the delivery fees. So we had very, very high international charges and almost immaterial domestic charges. So all competition, all revenue potential for the second carriers was based upon that margin between the local access charge of the incumbent and the delivery fee paid by the then incumbent international provider. That is a very obscure and unusual resale model, but necessary. Normally, those carriers would have drawn their revenue from international services as they would in Singapore, Australia, the UK and the US. That option was not available. As a result, there was no relationship in Hong Kong between revenue sourcing and build. Not surprisingly, the market reacted accordingly. This was unwound during a transition period which is really reversing the path back down to the greenfields site that should have been begun with.

We had in 1998 the shift to service liberalization and then to facilities in 2000 in the international sector. This began a tracking down of that traditional revenue source. Again, we had a group of operators very addicted to an international revenue flow under great threat because of this reduction in the delivery fee. At the same time we had a rebalancing of local exchange line prices progressively. Still below cost, but starting to make it look like a more attractive sector. But we had not had a second carrier launch into that sector yet because, to begin with, the money was in resale. So **the regulatory policy for domestic entry was not really combined with build commitments. Even in 1998 the build obligations were renegotiated, they were not based upon incentives, they were based upon obligations.** So, ideally, the market should set pricing incentives to encourage build, but were actually forcing people at various rest points in the regulatory environment to renegotiate, to withhold licences, to withhold licences to competitors to renegotiate the build. Of course, once that deal is done there is no incentive in place to really comply or to exceed that level. That is to be compared with Australia with a very extensive build requirement under the licence, also Singapore ultimately met by the

merger of Star Hub and SCV, but there was a significant build up requirement that has now been addressed.

So Hong Kong is a very progressive market. You hear a lot of complaint about it and OFTA has done a brilliant job in terms of adopting the very best of international regulatory applications. In fact, in some respects it has exceeded those applications and perhaps been too aggressive in the way that it addressed issues such as interconnection. It is a very limited city market we have here with multiple operators. What we are actually seeing now is, margins are very thin because of a high level of competition. That necessarily turns the market back in on itself and the market begins to say, well, our problem is interconnection charges. The problem is not interconnection charges, the problem is competition and decreasing margins. We have seen even in mobile, a highly profitable sector, some of the carriers with HK\$2 billion profits in 1996 reduced to major losses this year. So we are refocusing on an old issue, interconnection, purely because pricing and retail pricing has come down. So it is quite difficult to identify a market that is more competitive intrinsically because of the geography and the nature of high-rise connections, but also terms of what OFTA has done in this market.

So we should not deceive ourselves. Looking at local interconnection charges in Hong Kong. They were initially set in a very difficult operating environment for second carriers. We cannot deny as they launched it was difficult to actually find the right business model. So not surprisingly there was great pressure for low charges. Those pressures were acceded to. What we see now in the marketplace is a direct result of an historical series of events with the low interconnection charges we saw in terms of the graph in Hong Kong being the lowest series of charges in the world for both the loop and for type I switched interconnection. Importantly also - I go back to the first issue - Australia and Singapore began with much higher charges. You may say, well, those markets are fundamentally different. Certainly Australia involves more cost in actually taking service to certain parts of that market. **Singapore is very similar, we cannot do a direct comparison of charges because Singaporean charges are subject to the Official Secrets Act and you would actually be jailed if you were to disclose them** But I think it is well-known that they are in fact higher than in Hong Kong. Hong Kong began at a lower point for switch interconnection. Importantly, in this market we have always regulated the lower level carriers for the service providers. There has always been this PNETS charge based on a full distributor cost.

Other markets, including both Australia and Singapore, the US and the UK, in fact that part of the market was left to be competed for by the new entrant carriers. So prices began high. There was a margin, the issue that Agnes identified did not occur in those markets. It did not occur not because the interconnection charges here are too high, because they are not, it was because in those markets the charge to the service provider was left high leaving it a margin above a base level cost driven interconnection charge. Consequently, Optus and Star Hub in those territories were able to enter that market and compete down with the incumbent the price. So a margin was left to compete for that encouraged the build. **In Hong Kong, even though service providers got a pretty good break early on because they had FDC and in fact had charges well below**

carrier/carrier interconnection charges in other markets. That left players such as New T&T in a difficult position because they were unable to compete for that custom. It is not a function of interconnection charge, it is a function of forcing down the charge between the incumbent and the service provider to too low a level. We also had, in the early phases, a battle between the ISPs and the regulators. It actually at one stage got to the ISP Association of Hong Kong issuing a public challenge to OFTA to come and debate the issue in public forum. That was **in 1996 when some ISPs in the States actually did not pay access charges and it was not recognized as being a commercial service in the early days of the Internet. So there was a very, very strong lobby group in Hong Kong to reduce the ISP charge. It is still a strong lobby group with many members. Not surprisingly, that pressure does lead to a further emphasis towards a progressive lowering each year.** We have just seen another revision of that charge and those charges are extremely low at this point in time.

Lack of local call charges and initial price capping prevented any A end revenue in Hong Kong. That has really been a problem and has chilled the market for domestic services here. It was not quite as difficult in either Australia or Singapore where there was a lucrative local market to be competed for. Things could have been quite different in Hong Kong, there was a paper released in 1995 which proposed four different options, one of which was actually having local call charges in Hong Kong. It was not pursued. That could have led to a different pricing incentive and encouraged entry. It is a very hot political topic and I think we touched upon it earlier, it is unlikely in Hong Kong that we will see that addressed in the near future. So interconnection and the liberalization paper here in Hong Kong. It is reasonable to conclude that with seven years head start the second carriers are going to maintain large networks and be more significant builders than any third or fourth networks. Any fourth networks will have from 2003. Even the second carriers who have had seven years of the market have had a very targeted build and we cannot expect the third or fourth networks to do anything different. We will see the EFTNS moving down and building their own backhaul here. That is just filling in their network. Although it is not part of the current consultation proposals, we will have the mobiles agitating to actually provide their own backbone, some corporate build. But the third networks will position as service providers which leads to the question: What do we do with interconnection charges with those carriers? We know we have very low interconnection charges in Hong Kong now; do we actually drop everyone down to that level, do we lift that level to a middle ground? We have seen resale, a small amount of infrastructure competition in the local loop in the last seven years. We cannot expect this next phase of liberalization to really change that. **In my view, the market has really done most of what it will do in terms of build.** We might see some major players enter the market with PRC interests behind them, for example, but they will not build out to major customer access networks here. This is the pressure we now see with network providers, service providers and customers and there will be a compression of those layers **and the customers will seek to look and feel like carriers if they're HSBC,** and they might try and achieve a licence and provide service to some of their large corporate networks. The distinctions start to disappear. In that market, how do we actually address interconnection? How do we address those various tiers? How do we link those that perform in terms of build with their access prices?

To touch upon pricing models, we have not looked at those in great detail today. They are important, but their application is critical. I think so often we treat pricing models as a very exact science. Anyone who has done a business case for investment will know that business cases are very, very, sensitive to assumptions. Pricing models are no different. These things can be very volatile. A good way of looking at it is, there were two particular examples in the Australian market, one involving a reassessment of the universal service charge back in 1999 where Telstra, adopting a particular pricing methodology that had been set by a major US consultant, came to a conclusion its deficit was \$1.8 billion and the competitors reached a figure of \$200 million. They all worked off a single pricing model, a model developed to a very precise degree by a consultant and just plugging in variables to that model yet the disparity is \$1.6 billion. Another example in that market was when NERA looked at the interconnection charges for the ACCC, adopted a current cost approach and I think following MH's issue raised earlier on, applied local loop costs and actually assumed they would rebuild the entire network country-wide and retrench all the ducting and concluded pricing was too low and came up with a price about 4 cents above the 3 plus cents in the marketplace, that is Australian cents. So these models are very volatile, they exist on a spectrum, and LRIC, TSLRIC, SMRC, FDC and the ECPR model are all in the spectrum. It is not difficult to get from one point to another by adjusting some of the variables. So perhaps the debate should not be, do we choose LRAIC or do we choose FDC, but assume that we choose LRAIC, assume we choose LRAIC as MH has suggested with a forward looking cost, it may indeed be higher than FDC. It is really how we adjust those variables that is important.

In Hong Kong we have LRAIC, but it is a very aggressive LRAIC and it does knock out a number of important costs. There are some level of shared costs that should be included. I am not saying that all costs straightaway should be included up to an FDC level. **Depreciation levels are at issue, the exclusion of network conditioning is at issue, and a variable approach to historic and current cost.** So MH is right, there is some confusion about debates between FDC and LRAIC because one uses historic and one uses current typically. By the same token, there is a slight confusion in our own system where we pick and choose between historic and current. So the focus is, really, **we have this extremely low set of rates. Hong Kong is now sitting at 2.2 cents with 3.3 cents set up charge. Australia is sitting at around 8 cents, between 6 to 8 cents Hong Kong and that is under challenge by Telstra, they would say it should sit more around 9 or 10 cents Hong Kong. So that gives you an example of a comparison between those two markets.** After a very aggressive process in Australia the price is still substantially higher and contested at that level than in Hong Kong. Finally, we need to actually assess in Hong Kong: Should we test the theory of practice? Obviously if pricing was currently above efficient levels we would have seen more build. We have not seen the build. It follows per se that the pricing in fact must be low. We can actually prove our theories in the marketplace. **An efficient charge is not a precise issue, so we should perhaps now start to err on the side of competition.** Particularly with this new phase of liberalization we have open market entry at all levels to niche markets to major markets, even though it is proposed not with significant licence obligations.

Therefore, if it is more efficient to build and the prices are too high, that is available and that can be done. I am not saying revise the system significantly and move to an ECPR model, as nobody would recognize as being appropriate. By the same token, we can now start to relax this aggressive approach and start to test the market and see at what level will people cease to build the efficient providers adopting new technologies and we have all those technologies in this marketplace. Has Hong Kong got it right, viewed amongst the Asia regional comparables? We have the lowest charges in the world but that is not necessarily a measure of success. We have comparatively low infrastructure build given the size of the territory, the number of operators and all the advantages that we have here. So I think you would say the proof is in the market, the proof is in what has occurred. Probably the next phase is all the additional operators will now want to come down to that level, that current low 2 cent level set-up charge. If they do that that accentuates the problem in a sense. We get a cycled addiction to that regulated price, no build, therefore a greater desire to actually keep lowering in price. You cannot break out of that. In that sense, there is not a need to entirely rebuild the Hong Kong system, but I think we can say with confidence we have done a great job with liberalizing here, we have all the benefits that you require in the marketplace. Let us have some confidence that with this next phase of market entry, the fourth phase of market entry, we can start to err towards the higher side of the pricing and actually get that increased investment in the customer access network in new technologies. Thank you.

REGULATORY TRANSITION HONG KONG IN CONTEXT

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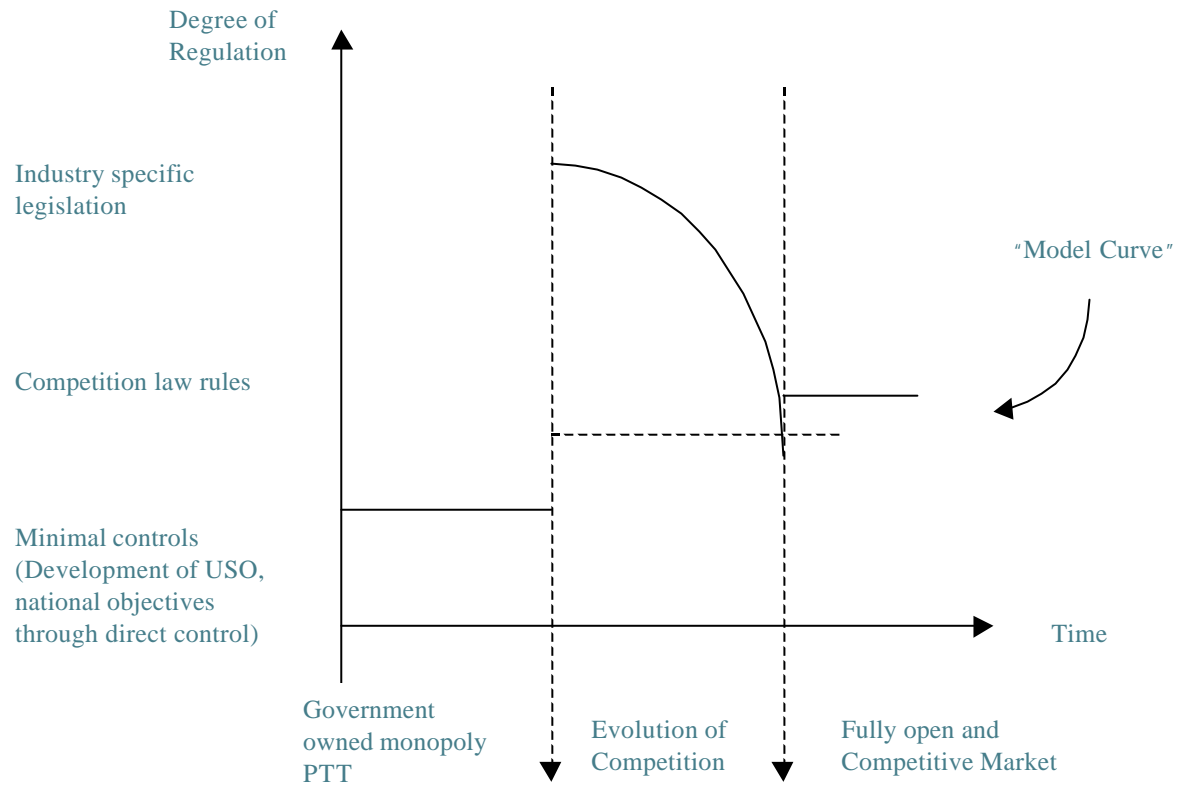
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Regulation 101

- Regulation is a means to an end not an end in itself
- Regulation is a surrogate for competition to address a market aberration - dominance
- The perfect regulatory environment is one that creates the conditions for its own removal
- The most important and difficult choice for a regulator is when not to regulate
- Regulation must constantly evolve with the market

The Implementation of Regulation 101



Regulatory Trends

- Service providers seeking carrier rights
- Eroding distinctions between NSPs and SPs
- Eroding distinctions between mobile/fixed line
- Blurring of content/telecommunications networks
- Technology making regulatory regimes redundant
- Industry specific rules to generic competition laws
- Each phase creates another game theory analysis for operators

The Historical Context of Regulation

- All regulatory systems are created in a historical context
- Specialist regulation operates within parameters set by government
- Specialist regulators in each country adopt international best practice but apply it pragmatically
- Greenfields regulation requires a greenfields site, few regulators are so fortunate

Greenfields Regulation

- Greenfields regulation opens all sectors to oligopoly infrastructure competition at once
- Competition then takes hold in the international sector, then long distance and then the local sector
- Interconnection initially focuses on the customer access network and pricing encourages efficient buy/build
- Pricing regulation begins with tariff approvals but evolves to competition reviews
- Basic regulation is progressively lifted in favour of more complex competition analysis

Hong Kong Was not a Greenfields Site

- Closest regional comparables are Australia and Singapore
- 3 entrants in Hong Kong (initial duopoly policy in Australia, later collapsed) and Singapore (revised)
- The international exclusivity affected the entire model (not present in Australia and Singapore)
- No long distance market (there is in Australia) and no local call charges (not present in Australia and Singapore)
- Entire model premised on margins between retail and wholesale, principally the delivery fee (unique)
- The width of that margin was a material difference between the delivery fee and the LAC (unique)
- This margin had no relationship with build and the market reacted accordingly

The Reverse Path To a Greenfields Site

- In 1998 the structure for international liberalisation was set - 1999 Services/2000 Facilities
- The delivery fee tracked down with international charges and defaulted to the LAC on A categorisation
- Rebalancing of exchange line prices
- Regulatory policy re domestic entry set against new build commitments
- Importantly build based on obligations, not incentives
- Compare with extensive build obligations in Australia and Singapore (Singapore obligations ultimately met by merger)

The Domestic Market

- Since 1995 Hong Kong has offered at or near the lowest interconnection charges in the world
- In a limited city market there are 4/5 FTNS, 7 EFTNS, LMDS and 6 mobile carriers (significantly greater than Singapore or Australia)
- Number portability and local loop unbundling have existed since 1996 (earlier than Singapore and Australia)
- A limited geographic area with concentrated high rise access (similar to Singapore)
- Difficult to identify more competitive market conditions
- Do not confuse the effects of aggressive competition with the effects of wholesale rates

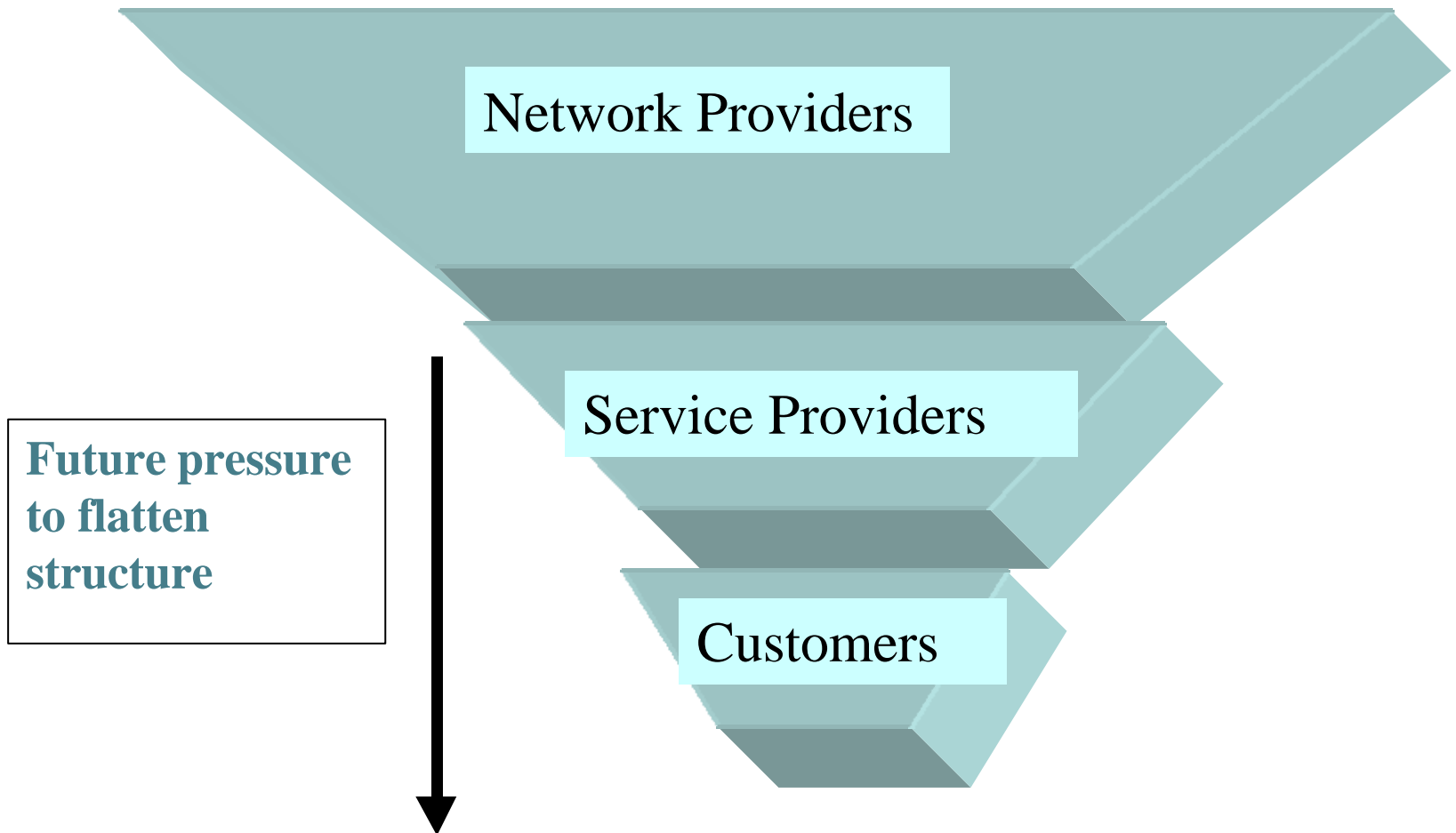
Local Interconnection Charges

- Initially set in a difficult operating environment for second carriers at low levels (compare much higher starting Australian and Singapore charges)
- Service providers (PNETS licensees) not priced by the market, but at FDC. PNETS not highly attractive market for second carriers (compare Australia where SP price not initially regulated)
- Battle with ISPs over charges, splitting of mobile and ISP rates, industry pressure to keep reducing ISP access charges
- Lack of local call charges and price capping renders A-end retail services marginal, except for corporate (Australia and Singapore more prospective)
- Therefore build incentives very low

Interconnection and Liberalisation

- It is reasonable to conclude that with 7 years head start the 2Ns will maintain larger networks than 3Ns
- The 2Ns have adopted targeted build and the 3Ns will adopt niche build (backhaul for EFTNS, potential mobile backbone build, some corporate build)
- On the network to service provider spectrum 3Ns will position as SPs (with the exception of existing carriers self supplying)
- They will act as resellers in already competitive market
- While 2Ns must address their existing build, 3Ns know that low interconnection charges are profitable
- How will the regulator respond to the weight of numbers?

Carrier/Reseller Structure



Pricing Models

- Pricing models are important but their application is critical - part science part judgement
- SMRC, LRIC, TSLRIC, FDC, ECPR exist on a spectrum and are malleable
- Aggressive application of FDC approximates LRIC and of LRIC approximates SMRC
- Hong Kong LRIC is aggressive through its low recognition of shared costs, depreciation levels, exclusion of network conditioning costs and variable adoption of historic and current costs
- Australia transitioned from about HK13 cents pm to HK8 cents (under challenge). Hong Kong stands at HK2.2 cents pm with a 3.3 cent set up cost

Should Theory be Tested by Practice

- If pricing is above an efficient build level we would have seen more build. Theories can be tested in practice
- Economically efficient charges are not precise and international comparisons and domestic data would suggest Hong Kong has trended to the lower side
- When the fixed line market is totally open assumptions about economic efficiency may be tested in practice
- It is therefore logical to trend to the highside at this point
- Therefore there are strong arguments that Hong Kong should adjust its emphasis

Conclusions - Has Hong Kong Got it Right

- Hong Kong has the lowest interconnection charges in the world - but this is not the measure of success
- Yet it has comparatively low infrastructure competition given the number of operators, its small size and its long period of liberalisation, a related outcome
- Low build out in a competitive market squeezes margins focusing operators on further wholesale reductions
- This creates a volatile cycle of regulatory dependence - contravening regulation 101
- The interconnection regime must signal that this cycle will be broken, particularly as fourth phase entry occurs

Conclusions - Has Hong Kong Got it Right (continued)

- In fourth phase entry regulators should have more confidence in market disciplines
- This does not mean removal of access regulation, but a material adjustment, more conducive to encouraging network platforms is warranted

John Ure : Thank you, Michael. In light of the time what I would like to do is just to—not to open out for general questions, we just do not have the time for that, but wondering whether either OFTA, PCCW or New T&T would like just 60 seconds each to make any comments or questions, because clearly the issues here are the subject of an ongoing consultation process. The latest consultation paper, the deadline for comments is now extended to—it was originally today, but am I correct to say it has been extended? To 27th November, this month. So the issues that have been raised here today, you have until 27 November to actually follow them up with comments to OFTA. MH, have you any final points to raise from a regulator's viewpoint?

M.H.Au (OFTA): I think the focus or one recurrent theme in this seminar is that interconnection charges are too low in Hong Kong, therefore, the incentive to invest in infrastructure would be undermined. Certainly we will be doing more study on this issue but I would suggest that before concluding that interconnection charges in Hong Kong are too low, first of all, you ought to weight the interconnection charges with the retail prices. For example, when you conclude that Hong Kong's interconnection charge is say one third or one half of that in Australia, I think you cannot do an absolute comparison, you have to weight that against the retail prices for business line and residential telephone line and then see whether or not with that sort of weighted comparison Hong Kong's interconnection charge is still the lowest in the world. Actually, the fact that interconnection charges are the lowest may be an indication of the effectiveness of the regulator. Another question is, it seems that there is a comment that if the interconnection charges are determined at the economically efficient level then the incentive to invest would be undermined. That seems to be not according with theory. Our economic cost will include a cost of capital that is commensurate with the risk. So if the investor is already compensated for the risk, I just cannot understand why the incentive should be undermined. I thought that that was the basic decision of the investor. The question is, whether or not the cost, interconnection charges, has already covered the cost of capital commensurate with risk.

Michael Reede : I was not suggesting set the price above an economically efficient price, my theory was more that we don't know where that price sits exactly. I think we would say that the economically efficient price is on a spectrum and on that spectrum we are currently sitting at the low end of where it might be and perhaps we should move to setting it towards the higher end and give the market the benefit of the doubt. It is this issue of the models just never being precise in both the assumptions and the way they are applied. So we are seeking to achieve an economically efficient price always. We don't know where it is, let's test it against the market. It is a matter of emphasis rather than a change of assumptions.

John Ure : Agnes, would you like to comment?

Agnes Tan: I would like to say from Wharf New T&T's perspective in relation to the Government's recent consultation paper on the full liberalization of the local wire line FTNS licences, our position is, we welcome open competition. Ideally, as often as we have seen in the mobile and the ETS market, we believe to achieve that there are

administrative barriers and high costs at the wholesale interconnect level that need to be dealt with. Also, there should not be any assumption that the new operators are not building up their infrastructure, there must be a recognition that there are important facilities in Hong Kong, probably more active in Hong Kong than anywhere else.

John Ure: Stuart, as the representative of our sponsor today, would you like to say anything?

Stuart Chiron: Actually, I would like to thank everybody for coming and thank Bloomburgs and thank John for hosting. I think it was a good session and MH thanks for coming. I would like to thank the people who participated as speakers and everybody else in the audience.

John Ure: Thank you, Stuart. I would just like to echo that very fine remark. I think the presentations here have been really superb and it is a shame in fact that we cannot do them full justice by discussing them for much longer. I think the issues that have been brought up today are really critical issues. The fact that Hong Kong has got it right more or less for so long—and therefore Hong Kong tends, as Michael was saying, around Asia people look to Hong Kong for ideas and guidance—it does not mean that we are not about to launch into a very different period and some of the issues that Mr Yip raised, for example, obviously are very pertinent which we have to address. One of the things I found coming out of the contributions was that the things that don't seem to work very well here don't seem to work very well elsewhere either. So everybody is grappling with these issues.

I just throw in one final comment, that is, we can get the cost of capital issue right, we can get the interconnection charges right, but of course the other side of the coin is, is there a business case? Is there an investment climate? Clearly, the nature of the whole investment climate has changed very, very radically. So in a sense, getting things not totally right did not matter too much in the past. But now it does because we cannot count on companies coming in and investing huge amounts of money on what might be a daydream. On the contrary, we are obviously going to go through a period, not just in Hong Kong but elsewhere, of consolidation and some quite some difficult times. So this debate is absolutely very, very crucial and I think it is the beginning rather than the end of this debate. So I would like to thank everybody here very much indeed for coming. All these proceedings will be up on the web site very shortly in the next two or three weeks and, again, we would like to thank Bloomberg for the use of the auditorium, and also for PCCW for sponsoring this particular forum. Thank you very much indeed. [5.35 pm conference adjourned] [13 November 2001]