

**LOCAL TELECOMMUNICATION COMPETITION: DEVELOPMENTS AND POLICY ISSUES**

**ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT**

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## **FOREWORD**

This report was presented to the Working Party on Telecommunications and Information Services Policies (TISP) in September 1996 and was recommended to be made available to the public by the Committee for Information, Computer and Communications Policy in the same month.

The report was prepared by Dr Sam Paltridge of the OECD's Directorate for Science, Technology and Industry. It is published on the responsibility of the Secretary-General of the OECD.

## MAIN POINTS

By the beginning of 1996, eight OECD countries had liberalised the provision of public switched telecommunication networks (PSTN) in their markets. In the other 18 OECD countries the incumbent public telecommunication operator (PTO) had the sole right to provide PSTN infrastructure. Over the next two years the balance between competitive and monopoly markets will fundamentally change with the majority of countries with monopolies moving to liberalise their PSTN markets. This will mean that new market entrants may compete across the entire range of telecommunication services -- local, national and international. This is timely because the old divisions between these segments of telecommunication service are rapidly breaking down.

At the same time existing players and new market entrants are rethinking their attitude toward local access networks. In a monopoly environment local access networks were viewed, in the main, as a cost of doing business. In a competitive environment local access networks are increasingly seen to provide incumbent PTOs with a tremendous strategic asset and quite possibly the most secure route toward revenue growth in the dynamic information and communication industry. New market players recognise the strategic importance of access to customers and the potential of new access technologies to bring down costs and provide new revenue streams.

Policy makers in a growing number of countries have recognised that liberalisation of telecommunication infrastructure provision is the key to achieving the benefits made possible by technological convergence. Many of the aims governments have for information infrastructure will only be realised if the same benefits that were wrought in other telecommunication markets by policy reform occur with local access networks. These benefits include increased innovation in technology, services and pricing, as well as lower pricing and greater customer choice. Historically these attributes are what has been largely absent in local access networks provided by monopoly operators. Today, in those countries that have opened the local telecommunication market, these benefits are already being realised and universal service improved and expanded.

Long presented by monopoly PTOs as a justification for delaying liberalisation it is now increasingly accepted that competition in local network access markets boosts universal service. There is growing evidence that delaying the introduction of liberalisation would considerably slow expansion of universal service in countries with relatively low telephone penetration rates. Where permitted, contrary to the claims of some monopoly PTOs, new market entrants are not cherry picking but planting cherry trees! New entrants are rolling out networks at record speed because they augment existing networks, bring new investment and are employing new technologies. One operator in the UK plans to build a network between 1996 and 2001 offering 75 per cent of the UK population the possibility of connection. This is the same length of time, should they elect to take it up, granted to some European countries to extend monopoly provision of service beyond 1998.

Action to extend monopolies is further brought into question by the fact that in the UK one new entrant is supplying advanced services as part of standard telephone service (at no additional cost), providing substantial reductions on the price for basic services and -- in a first for the telecommunication industry -- offering a money back guarantee if business and residential customers are not satisfied with their service. Moreover experience has shown that incumbent PTOs can also benefit from the introduction of competition, including in some cases record profitability, at a time when prices are falling, due to market growth and greater efficiency stimulated by competition. There is no persuasive case for the continuation of monopolies and on the contrary mounting evidence that they will slow economic and social development in countries that extend this situation beyond 1998.

Nevertheless it is well recognised that challenges exist in the transition to a fully competitive market. The existing bottleneck power derived from ownership and management of local access networks needs to be taken into account in any reform process or the potential benefits are put at risk. This document provides an overview of policy and commercial developments in local telecommunication markets for discussion. It describes local competition developments in all OECD countries that had liberalised the provision of telecommunication infrastructure for the PSTN by mid-1996. The paper highlights the case of the UK, which is most advanced in implementing local telecommunication competition. The final section of the paper raises some issues that have emerged with local telecommunication that are distinct from those arising generally in telecommunication liberalisation.

## LOCAL TELECOMMUNICATION COMPETITION

### Defining Local Markets

By the beginning of 1996, eight OECD countries had liberalised PSTN in their markets. These countries were Australia, Canada, Finland, Japan, New Zealand, Sweden, the UK and the US. In mid-1996 Denmark and Mexico joined this group.<sup>1</sup> In the other 18 OECD countries the incumbent PTO had the sole right to provide PSTN infrastructure.<sup>2</sup> Over the next two years the balance between competitive and monopoly markets will fundamentally change with the majority of countries with monopolies moving to liberalise their PSTN markets. This will mean that new market entrants may compete across the entire range of telecommunication services -- local, national and international.

What is meant by local telecommunication competition as distinct from national or international? The demarcations between these categories have largely been inherited from a world in which monopoly PTOs used such terms for their own management purposes. Sometimes governments adopted these same demarcations for industry regulation. Broadly speaking 'local telecommunication' was a term used to describe the provision of customer access networks and telecommunication services over relatively short distances. Each customer of a PTO had at least one telecommunication mainline connected to an exchange which was used to switch calls on the network.<sup>3</sup> If the calling parties were both within a local area, the boundaries of which were defined by PTOs for billing network use, the service was deemed to be 'local telecommunication'. On the other hand national and international telecommunication meant the provision of facilities that linked local networks and allowed services to be provided across a country and around the world.

As in most parts of the telecommunication industry technological change is blurring distinctions between local and other services. For some considerable time local calls have often passed through several telecommunication exchanges breaking any link between network configuration and the definition of local service. Over recent years PTOs have been reducing the number of telecommunication exchanges in their networks. Between 1991 and 1994 the number of central office switches in the US was reduced from 9674 to 9164.<sup>4</sup> Over the same period the number of switched access lines these exchanges support, grew from 130 million to 141 million.<sup>5</sup>

Even without considering the impact of technological change the boundaries between categories of telecommunication service have always been of an arbitrary nature. Large differences between the size of local calling areas (i.e. some less than 5 kms and others more than 40 kms) have long existed in the OECD area. Sometimes local calling areas were defined by PTOs with reference to factors that can be broadly defined as 'universal service' considerations. For example a PTO might apply criteria to ensure most of their customers could telephone community services (e.g. nearest hospital, police, school, town etc.) for the price of a local call. In other words a customer could access a 'community of interest' at the lowest tariff available.



In the absence of competition the size or shape of local calling boundaries was largely an issue of importance only for the communities affected and the PTO. Differences of opinion sometimes arose over the dimensions of local calling area because it was not always possible to precisely define a community of interest. Sometimes the response of PTOs to these instances was to create tariff structures which allowed adjoining local calling areas to benefit from rates that were lower than the shortest pricing bands. In those countries where this issue became political it has subsequently made it difficult to alter agreed local boundaries. More recently, however, a number of competitive issues have emerged in respect to the dimensions of local calling areas and the wider definition of local telecommunication.

## **Redefining Local Markets**

Disputes over the demarcation of telecommunication industry segments generally arise in liberal markets during negotiations between the incumbents and new market entrants over the interconnection of networks. In Mexico, when the incumbent was required to propose a plan for interconnection between their network and the 'long distance' networks of new market entrants, disagreement emerged over how many points of interconnection there should be. The incumbent PTO favoured a lower number of interconnect points while its rivals favoured a higher number. According to the new market entrants one reason that the incumbent PTO attempted to minimise the number of interconnect points was to confine 'long distance' facilities competition to a limited number of routes. For an incumbent restricting the number of interconnect points can also raise its competitors costs and allow it to capture a larger proportion of its competitors revenue stream. Similarly in New Zealand, in interconnect negotiations between the incumbent, Telecom New Zealand (TCNZ), and Clear Communications, TCNZ expected that granting more interconnect points would enable its new rival to gain long distance market share more easily.<sup>6</sup>

While interconnection disputes might be seen as defining market segments from the top down it is also the case that competition issues are emerging at the boundary of local calling areas. One such occurrence has been when PTOs have applied to extend the area in which the principles of local call pricing apply. In Australia this issue was raised when Telstra, the incumbent PTO, filed a proposed tariff that would have enabled its customers to call up to 75 km for a flat rate of US\$ 0.30.<sup>7</sup> In Australia the size of local calling areas in the largest cities is 40 km and the average local call area is 32 km. Local calls are charged at the rate of US\$ 0.19 per call, irrespective of their duration.

In Australia, as elsewhere, traditional pricing of telecommunication networks has meant that local calls were relatively inexpensive compared to short distance measured calls. Accordingly the question was raised as to whether the Telstra was restructuring tariffs to limit the size of the long distance market by expanding 'local calling areas' (or at least areas in which local pricing principles applied). If this is true, then as with the interconnection example cited above, the incumbent may be redefining local and national market segments in an attempt to defend existing market share. In other words because new market entrants do not own local networks they not only face a smaller long distance market but are limited in their ability to provide local service. In the Australian case, Austel, the telecommunication regulator, disallowed the Telstra tariff on the basis that it was anti-competitive for the long distance market.

In future the number of these types of issues are going to be compounded as competitive pressures in response to the market, and the enabling capabilities of technological change, drive a radical restructuring of tariffs. The difficulty for policy makers will be to discern which tariffs are anti-competitive and which are innovative options benefiting customers and PTOs. In New Zealand, during 1995 TCNZ introduced 'NZ\$ 5 Saturdays' (US\$ 3.18) and then followed this up with 'NZ\$ 5 Weekends'.<sup>8</sup>

This enabled residential customers to make unlimited national long distance calls for no more than US\$ 3.18 per call<sup>9</sup>. TCNZ reports the tariff resulted in ‘very positive business results’ for them and savings for customers. In fact call volumes doubled on some weekends with an overall gain in earnings for TCNZ.<sup>10</sup> This is a very significant development because it is the first time a PTO has taken principles common to local call charging, in a number of OECD countries, and applied them to long distance calls.

In countries with multiple operators attempts by incumbent PTOs to restructure tariffs naturally give rise to competition questions. However it is also true that some incumbent PTOs are extending local call areas as part of their rebalancing process ahead of liberalisation. The rebalancing process undertaken by France Telecom represents an interesting case in point. In 1994, the size of most local calling areas in France was considerably enlarged but the unit of call measurement was cut to three minutes. Prior to the change France Telecom’s customers were charged for calls within their local area in units of six minutes. In other words subscribers could dial, at local rates, to a larger calling area but for calls beyond three minutes the charge increased (*i.e.* the price of a six minute call doubled to a location within the previous calling area but was much less expensive in the extended area).

According to France Telecom almost three quarters of its local calls were unaffected by the change because they last less than three minutes. At the same time France Telecom brought down the cost of calls over longer distances by expanding the time in which units are measured from 17 seconds to 19 seconds. For users of traditional telecommunication services, based on ‘telephony patterns’ of use, France Telecom calculated the overall restructuring represented a 2.4 per cent reduction in prices to customers.<sup>11</sup>

The reason put forward by France Telecom for changes to the tariff structure was that due to technological change, distance counts less and less in the cost of providing telephony while the length of calls is becoming a key determining cost.<sup>12</sup> If this principle is correct France Telecom’s new tariff structure may better reflect underlying costs. However in terms of the size of the long distance market, relative to the local market, such a change has considerable impact. Under the new scheme France Telecom’s customers increased, by an average of seven times, the number of people they could call at local rates. These calling opportunities would formerly have been considered part of the long distance market in France. In other words the size of the long distance market was reduced relative to the local market for potential wireline and wireless competitors to France Telecom.

Changing the dimensions of local calling areas is only one segment of the tariff rebalancing. Since the restructuring described above occurred further rebalancing has been undertaken by France Telecom with greater reductions in long distance prices and increases in fixed charges (line rentals). This restructuring is typical of the general tariff rebalancing trend throughout the OECD area. In general the price of long distance calls (national and international) continues to fall and the price of local calls and fixed charges (mainly line rentals) continues to rise. So in general terms it can be said that the price of ‘local telecommunication’ is rising while the price of ‘national and international telecommunication’ is falling.

The major impact of this tariff rebalancing is to increase the size of the local telecommunication market relative to national and long distance markets. In other words the market for local telecommunication, which is already by far the largest telecommunication market, is increasing its relative share of the total market. Table 1 and Table 2 provide examples of the impact tariff rebalancing is having for a PTO with a relatively low telephone penetration rate (Telmex) and one with a more mature network (BT). In Mexico the contribution of local telecommunication to Telmex’s total revenues has increased from 20 per cent in 1988 to 45 per cent in 1994. This was due to tariff rebalancing and network expansion. In the UK the tariff rebalancing process was commenced earlier than in Mexico. Local telecommunication revenue, as reported by OfTel, now makes up over half of BT’s revenue allocated by

services.<sup>13</sup> By itself fixed charge revenue is larger than the retail call revenue derived from national and international calls. Moreover the contribution from fixed charges to BT revenues has been growing faster than the total revenue contributed by Cellnet, BT's fast growing mobile subsidiary.

All indications are that the tariff rebalancing process will continue (although the emphasis may change between different elements of service) for a number of reasons. One reason is because incumbent PTOs unanimously say that the new pricing structures better reflect costs. Another reason is that experience has shown that when telecommunication markets are liberalised competitors have made the greatest gains in national and international call markets. In other words PTOs have a considerable incentive to make it harder for competitors in these markets by lowering corresponding prices and increasing efficiency. In addition the potential for 'bypass' of traditional calling procedures (e.g. call back, Internet telephony) is increasing by placing pressure for a reduction of international tariffs. None of the alternative calling procedures by-pass local access network pricing. All these factors point toward a larger market for 'local telecommunication' relative to traditional national and international markets. Indeed as one new entrant in the UK market has put it:

"BT is responding to competition by seeking to re-balance its tariffs in order to bring them more into line with costs; that is, to decrease long distance prices relative to local access and service prices. This trend will continue. As this happens, access network operators will also benefit from the rebalancing but operators who only provide long distance service will see declining profit margins".<sup>14</sup>

The trend toward larger local markets raises an obvious question in relation to the ways in which telecommunication services have been commonly thought about to date. If, as is commonly argued by incumbent PTOs, premium services such as long distance and international calls cross subsidise the provision of local services will competitors enter the local market? In considering this question several factors need to be taken into account:

- the problematic nature of cost allocation between services;
- the existing inefficiencies in the provision of local telecommunication;
- the impact of competition, technological innovation and multiple revenue streams;
- the strategic importance of access to customers;
- the growth of local market as patterns of network use change and the need for network upgrades;
- uncertain pricing models for access to information infrastructure.

**First**, the allocation of costs between different segments of the telecommunication market is problematic, even if the information has been systematically collected and agreed by all parties, because a great deal of the cost of building and managing a network is joint and common cost. Simply put a subscriber needs a telephone line to make local, national and international calls. The difficulty in apportioning costs between services means, of course, that the level of profit or loss on individual segments of telecommunication is also problematic. This is clearly evident in numerous and controversial debates over the cost of incumbent PTOs providing different aspects of interconnection and universal service. What this means in terms of assessing opportunities in the provision of 'local telecommunication' is that market entrants may take a different view of the profitability of particular services than academic exercises of cost allocation which have been produced to influence regulatory proceedings. More

importantly a new entrant will not build a business plan around the provision of only 'local telecommunication'. New market entrants building and using their own infrastructure will sell a whole range of telecommunication services with a view to bottom line profitability, in an industry that is highly profitable. MCI provides one example of how a new market entrant might view local telecommunication markets:

“For MCI, the opening of the local telecommunications market represents the greatest opportunity in our history. The last time we faced a similar opportunity was in 1985 -- the year "equal access" freed customers from dialling extra numbers to place their long distance calls. Then, we looked at competing in a \$ 46 billion long distance market, which has grown into a \$ 75 billion market. Now, the newly opened local market is more than \$ 94 billion and is estimated to grow to \$ 128 billion by 2002. Not only does MCI now have an extraordinary revenue opportunity by offering local services, we have the chance to cut deeply into access costs that are 46 per cent of our revenue. The local market is also as rich as it is big. While operating cash flow for the long distance industry is a healthy 20 per cent, the seven regional Bell operating companies (RBOCs) have an operating cash flow of 46 per cent”.<sup>15</sup>

**Second**, when incumbent PTOs say that tariff rebalancing better reflects costs of providing different elements of telecommunication service they mean their costs. Even if all parties agree on a methodology for cost allocation between services it is by no means evident that existing local telecommunication is being efficiently provided. All the available evidence suggests that PTOs could substantially reduce the cost of providing local telecommunication if they were more efficient. This is one reason competition can be applied as a tool to bring down the cost of universal service.

**Third**, where competition has been introduced into the local telecommunication market new technologies with different cost structures and revenue potential are being introduced. One example of a technology with a different cost structure is the innovative use of fixed wireless technologies to provide a range of telecommunication services. At the same time cable networks, that previously only provided cable television, are now moving to provide telephony, high speed Internet access and other services producing new revenue streams for the provision of local service.

**Fourth**, is the strategic and commercial importance of owning and managing customer access networks. In those countries with liberal markets experience has shown that PTOs owning and managing local access networks are much more able to defend national and international market share against new rivals. At the same time in those instances when a new entrant, with existing customer access, has been admitted to the national and international market they have quickly wrenched market share from the incumbent PTO that did not own a local access network. The advantages of owning and managing an access network include existing customer relationships, billing, and customer information. The impact of bottleneck control of local access networks is discussed in more detail in Section II of this document.

**Fifth**, the economics of different telecommunication markets have always been predicated on traditional use of local access networks for telephony. As new services are developed, such as access to Internet or other on-line services, patterns of network use can be expected to change. It is too early to say what impact small business and residential subscribers accessing the Internet through dial-up services will have on average local call times and the demand for second lines. All indications are that average local call times will substantially increase. In the US, where local calls are often at unmeasured rates, the average call to an online service provider grew from 19 minutes in 1992 to over 33 minutes in 1994.<sup>16</sup> *Telephony* reports that 20 per cent of these calls last more than 60 minutes. Moreover there has been a tremendous

increase in demand for 'second lines' for residential customers. For the future these trends may demand substantial investment as costs shift from being almost fully incremental in nature (Box 1). At present however the benefits and opportunities would seem to outweigh the additional costs. Bell Atlantic stated in its 1995 Annual Report:

"In new markets such as long distance, video, and Internet access, we have significant fresh opportunities for incremental growth, with market entry strategies and many of the necessary alliances in place. And, with our advanced network, we can enter these markets with very little incremental investment. Here's what the new era means for Bell Atlantic. Historically, growth in our core network business, measured by number of telephone lines, rose only as fast as the number of households. In 1995, all that changed because consumers fundamentally changed the way they use their telephones. We estimate that more than two million households in our region are connected to the Internet or an on-line service. A similar number of people work at home and want access to their office local area networks and co-workers. Some 40 000 customers use networked PCs to do video-conferencing on-line. With the development of new computing languages like Java, just-in-time software "applets", and multimedia web sites, the network itself is becoming the computing platform. These factors, coupled with a tremendous customer base for value-added, intelligent network features, are transforming the growth characteristics of our core network business. Last year saw the biggest single-year increase in new residential access lines since World War II -- driven not by population growth, but by growing demand for second telephone lines and data connectivity. More than 16 per cent of American households have more than one telephone line, a number that is predicted to grow to 35 per cent by the end of the decade. At Bell Atlantic, we expect to sell more than 600 000 second lines in 1996".

The latest available Federal Communications Commission (FCC) data for end 1994 (Table 3), and reports from most Regional Bell Operating Companies (RBOCs) of buoyant second line sales during 1996, confirm the growing importance of the residential second line market. Bell Atlantic sales of second residential lines totalled 212 thousand lines in the second quarter of 1996, taking penetration in its region from 10.3 per cent to 14.2 per cent between June 1995 and June 1996.<sup>17</sup> SBC Communications, formerly Southwestern Bell, increased the penetration of second residential lines in households to 13.4 per cent. It is also true that ISDN use is significantly increasing for the first time, with tariffs aimed at residential users, and some customers may choose ISDN over a second residential line (Box 2).<sup>18</sup> Together with expanded use of mobile telecommunication, driven by the consumer market growth, the residential second line market has enabled leading PTOs in the US to experience record earnings in 1996 (Table 4).

Finally, the **sixth** reason that local access networks are critical to any company wanting to sell information infrastructure services is that no one yet knows what pricing models are going to succeed in the market place. In August 1996 'Europe Online' was declared bankrupt. Originally envisaged as an on-line service selling proprietary information, the initial business plan was overtaken by Internet developments and the company was unable to make the same adjustments as existing players successfully.<sup>19</sup> The Internet has fundamentally changed the pricing of proprietary information services such as Minitel and CompuServe. In March 1996 France Telecom slashed the price of Minitel access by 47 per cent at peak rates and off-peak access by 81 per cent. In May 1996 France Telecom launched an Internet access service call "Wanadoo" with prices competitive with IAPs in France. In the face of tough competition from IAPs, CompuServe has also brought down the cost of its proprietary information services and restructured its prices to offer relatively low cost Internet access. However, the major difference between France Telecom and CompuServe is that, as a PTO, France Telecom receives revenue from users in France accessing Minitel, "Wanadoo", or the services of other IAPs including CompuServe.

While prices for accessing content (proprietary or general Internet world wide web content) are falling the revenue from the carriage to these services is increasing due to PSTN tariff rebalancing. Revenue from basic local network access to the Internet is the most secure part of an industry subject to dynamic technological change and intense competition. Driven by competition Microsoft and Netscape must release new software upgrades for their respective 'web browsers' three or four times per year. Beta testing is now done by users in the market instead of the laboratory and predicting market shares, a year or two years from today, would be extremely difficult. By way of contrast in two years time virtually all 'local loop' connections for dial up Internet access will still be made via the incumbent PTO's network.

This does not mean that the provision of Internet access via local networks will not be subject to competition in future. Cable Communication Operators (CCOs) are working hard to introduce cable modems that will enable high speed access to the Internet. A number of CCOs expect to start commercial service in late 1996 with pricing for unlimited access at around US\$ 30 per month. If this pricing bundles carriage and Internet content access in the same package it would set a new baseline for access pricing. At the moment a US consumer, assuming they had unmeasured local calls, might pay US\$ 19 for fixed charges on the local loop (at 28.8 kbit/s) and US\$ 20 to an IAP. This would give a total of US\$ 39 per month for unlimited Internet access.<sup>20</sup> Of course the latter user would be paying much higher charges with measured rates for local calls, as in most other OECD countries, or for higher speed ISDN access via a PTO.<sup>21</sup>

Accordingly if cable modem technology progresses as expected it raises a number of questions for those service suppliers that do not own and operate access to customers. Will CCO networks be available on an unbundled or equal access basis to IAPs? Due to the fact that PTO pricing is primarily driven by pricing for telephony will IAPs be able to price services at a competitive level with CCOs if they only have PTO networks available to reach their customers? Indeed will rebalancing for telephony raise PSTN carriage costs for customers of IAPs at a time when CCOs bring down the cost of carriage for their customers? In summary those suppliers that own and manage local access infrastructure will be most securely placed to develop multiple revenue streams -- telephony, cable television and Internet access. Other service suppliers will have to rely on regulation, and carriage pricing that may not be suited to their service, to access customers via existing networks.

Taken together current trends in local telecommunication markets mean incumbent PTOs and new market entrants are taking a fresh look at the benefits of owning and managing customer access networks. For servicing business customers the strategy of new entrants such as MFS is clearly to own and manage their own infrastructure because, in their words, "It is ownership and control of the 'last mile' in to a customer's premises which enables MFS to deliver the level of service and speed of response demanded by business customers".<sup>22</sup> For residential markets this approach is typified by SBC Communications, whose Chairman and CEO noted after record second quarter earnings in 1996, "The outstanding performance of our telephone operations confirms our conviction that local telephone networks are not only critical competitive advantages but significant engines of growth".<sup>23</sup>

**Table 1. The Changing Balance of Telmex's Revenue Structure**

	1988	1989	1990	1991	1992	1993	1994
Local Service	20.2	20.1	31.6	36.4	40.7	42.8	45.3
National Long Distance	29.0	32.8	35.5	36.3	34.8	33.7	30.6
International	46.8	42.0	29.0	23.1	21.2	19.7	20.3
Other	3.9	5.0	3.8	4.1	3.3	3.8	3.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Telmex.

**Table 2. BT's Share of Revenues Reported to Oftel**

	92/93	93/94	94/95
Fixed (Connection/Rental)	26.4	27.4	29.8
Local calls	23.1	23.3	22.1
National calls	23.3	22.4	19.3
International calls	10.7	10.4	10.4
National leased lines	10.2	9.9	10.2
Mobile	3.8	4.0	5.7
Payphones	1.3	1.4	1.4
International leased lines	1.2	1.2	1.3

Source: Oftel.

**Table 3. Growth of Second lines in the US**

	Residential lines	Non-residential lines	Total Access lines	Households with telephone service	Additional residential lines	Percentage of additional lines for households with telephone service
1988	87.7	38.5	126.2	85.4	2.3	2.7
1989	90.0	40.6	130.6	87.4	2.6	3.0
1990	92.2	42.9	135.1	88.4	3.9	4.4
1991	95.9	42.5	138.4	89.4	6.5	7.3
1992	99.3	43.0	142.3	91.0	8.3	9.2
1993	101.9	45.2	147.1	93.0	8.8	9.5
1994	105.2	47.2	152.4	93.7	11.5	12.3

Source: FCC.

Table 4. Access Line Growth in the US Market

	2nd Quarter 1996 Net Income compared with 2nd Quarter 1995 (%)	Access Line Growth June 1995 - June 1996 (%)	Company comment in respect to access line growth
Ameritech	+12.5	4.2	N/A
Bell Atlantic	+10.6	3.5	Growth in home computer use and increasing family communication needs, resulted in sales of 212 000 second residential access lines further boosting penetration from 10.3 % to 14.2 % over the last 12 months.
Bell South	+12.5	5.0	Added 229 000 access lines, shattering the 2ndQ record of 176 000 set in 1995. Business lines grew at 8.7 % and 34 000 additional residential lines were added in the 2ndQ.
GTE	+10.0	6.7(1)	About half the residential growth came from second access lines.
Nynex	+11.8	3.8(2)	Unprecedented demand growth in access lines. Residential second lines grew 11.5 per cent and business access lines grew 7.5 per cent. This was the third successive record quarter of growth for Nynex.
Pacific Telesis	+8.1	4.7	Record access line growth in past 12 months. Business access lines grew at a record pace in 1996 adding 5.7 per cent. Residential lines grew 4.7 per cent up from 3.1 per cent in the 1stQ. More than half the residential sales were additional lines.
SBC	+13.3	5.3	SBC added 166 000 access lines compared to 105 000 for the 2nd Q 1995. This was a record. Second residential line penetration has now reached 13.4 %.
SNET	+14	3.3	Strong growth for residential 2nd lines.
Sprint	+28.9	5.3	Local telephone operating income rose 21.3% based on record access line growth.
US West(3)	+2.1	6.3	Record growth in revenue and access lines -- the latter up 4.9 % in the previous twelve months. Added more lines in first six months of 1996 than it did for the whole of 1995. Residential lines up 4.1% with a growth rate of 32.9 % for 2nd residential lines. Local service revenues were up 9.6 %.

1. GTE lines in the US.
2. Nynex lines in North-eastern US.
3. US West access line growth is normalised following the sale of some exchanges. Net income before normalisation was up 10.6 per cent.

Source: OECD.



### Box 1: Local Telecommunication Revenue, Investment and the Internet

Is there a downside to the tremendous growth being experienced by US PTOs with local access networks? Some evidence is emerging that increased call holding times are placing strains on local access networks that they were not designed to handle.<sup>24</sup> Bell Atlantic is reporting that the average length of calls to Internet Service Providers is 17.7 minutes compared to an average of 4 to 5 minutes for telephony. This can cause strains in networks that are configured for average line use of 9 minutes per day.<sup>25</sup> The other problem for PTOs in the US is that the revenue received from IAPs for standard lines used for incoming calls may not cover the full cost of upgrading the equipment necessary to support these lines.<sup>26</sup> In 1996 Bell Atlantic estimates that the revenue from IAPs in its area (US\$8 million) will only cover around one third of the cost (\$ 30 million) of upgrading those parts of the network that support these customers. On the other hand the customers of IAPs are also Bell Atlantic customers. Bell Atlantic's general revenues are being significantly boosted by the sale of second lines at incremental cost stimulated by customers wanting to access on-line services. Using average US prices for standard telephone service, revenue from the sale of 600 000 second lines in 1996 would garner around \$ 24.6 million in one-off connection fees and \$ 137 million in ongoing rental fees per annum.

In financial terms the expansion of the second line residential market in the US represents a considerable increase in the size of the local telecommunication market for connection and rental income. If 35 per cent of US homes have a second line by the end of the decade, based on average 1994 prices, new connections over that time would have raised US\$ 880 million for PTOs and US\$ 50 million in taxes. In terms of line rentals the second line market would grow from a US\$ 2.3 billion (plus US\$ 310 million tax) at the end of 1994 to US\$ 6.6 billion (plus US\$ 870 million tax) by the year 2000. Further price rebalancing by PTOs for local service would increase these figures accordingly. If the expectations of second residential line growth in the US are met, that segment of the market would be the fourth largest group of mainlines in the OECD area (behind the US, Japan and Germany). This would represent a large increase in the size of the local telecommunication market in the US, and potentially throughout the OECD area if other countries follow this trend.

The question of whether the additional revenue generated by Internet users would cover the costs of upgrading local networks is a moot point. *Telephony* has estimated that if current trends in the US continue the cost of upgrading switches could be US\$ 18 billion and a further US\$ 12 billion required for additional switching ports.<sup>27</sup> They say additional costs could also be caused by the need to reinforce local cooper loops. On the other hand it is not clear over what time period such investment would be required. Record profitability at the local exchange level would suggest that to date the majority of additional costs incurred have been of an incremental nature and strongly augmented core revenues. For the future the real question is what potential Internet services have to raise additional revenue for PTOs. At the end of July 1996 Bell Atlantic launched an Internet access service offering customers unlimited access for an effective price of US\$ 18.50.<sup>28</sup> This price represented a 7 per cent discount on Netcom's standard price of US\$ 19.95. Apart from on-line information service providers, such as America Online, Netcom is the largest IAP in the US. Clearly US PTOs are going to be very formidable competitors in the Internet access market which is expected to be very large because of their existing customer relationships. At penetration rates of one third of US households (@\$ 19 per month) Internet access becomes a US\$ 7.5 billion per annum market.

What might this mean for OECD countries? The major difference between the US and most other OECD countries is that local calls are charged at measured rates. While it is expected that average calling time will increase, it is likely to be more gradual than the US, and PTOs would be earning considerable revenue from increased local call time. In fact BT is introducing a 25 per cent discount for local calls that last more than 10 minutes.<sup>29</sup> In short PTOs with measured rates welcome longer calling time. The main problem for some of these PTOs is that local call prices, while not expensive for telephony, become fairly prohibitive for on-line users. This is tending to slow the growth for Internet expansion in these countries. Moreover with competition they are not introducing innovations, such as the BT discount noted, to ameliorate this situation perhaps preferring to hold back the market until they launch their own service.

**Box 2: Second Lines versus ISDN?**

One of the main reasons PTOs in most OECD countries are not yet experiencing the same growth in second residential lines as the US is the impact of monopoly provision of infrastructure is having on Internet expansion.<sup>30</sup> This includes the impact of higher pricing for leased lines being passed on through higher Internet Access Provider (IAP) charges, less availability of high speed backbone capacity, and lack of pricing innovation for local PSTN access. Given that most PTOs lay additional wires into residential premises as a matter of course, and that the investment represents a sunk cost that is not returning revenue, it is curious that even monopoly PTOs have rarely discounted the price for connection and rental of a second line. It may be true that in the past there was little demand for second residential lines, and that these discounts would also have had to be made available to business customers where demand was higher, but it would have seemed logical for PTOs to stimulate demand on what was a sunk cost.

Today the question of second line pricing is a little more complex because PTOs may be concerned about the impact discounted second lines might have on basic rate ISDN pricing. For example, in the Netherlands, basic rate ISDN pricing is less expensive for a residential user wanting a second line and enables faster access to the Internet than would a standard telephone line (Table 5). If PTT Netherlands discounted second residential lines some customers might prefer this service, in spite of the lower speed available, particularly if it was being used just for telephony. Similarly Bell Atlantic's ISDN pricing for residential users in Maryland is approaching parity with second line costs depending on the amount of time a user spends on-line and at what time of the day (Table 6). Prior to August 1996 users had to pay US\$ 28 per month in fixed charges and US\$ 24 for 20 hours of use at peak rates.<sup>31</sup> With unmeasured rates they would simply pay the rental on two lines and make unlimited local calls. A further factor was that ISDN users would also have had to pay a higher connection fee than for a residential line.<sup>32</sup> Unlike the Netherlands therefore users had much more incentive to use ordinary lines as opposed to basic ISDN. After August 1996 Maryland users could pay US\$ 28 per month, with 20 hours of use, compared to a total of \$ 52 per month under the old tariff structure. Similar to PTT Netherlands, if Bell Atlantic cut the price of second lines the approaching parity between ISDN and second lines options would be reduced.

**Table 5. ISDN versus Second Residential Line from PTT Netherlands**

(US\$ excluding VAT)	Second Line Pricing			ISDN Pricing		
	1	2	Total	0	1	2
Number of PSTN Lines	1	2	Total	0	1	2
Connection (1)	119.39	119.39	119.39	217.74	105.74	0
Monthly rental	13.16	13.16	26.32	24.16		
Set-up Call Charge	0			0.04		
Usage charge	Standard PSTN call charges					

1. A standard telephone connection costs \$119. The total assumes a user has an existing line and pays the rental for two lines. ISDN connection costs \$217 for a new user without an existing telephone line, \$105 for a user with one existing line and is free for a user with two lines.

Source: PTT Netherlands.

Table 6. **Bell Atlantic Residential ISDN Prices**

Tariff Option	Price per Month
Measured	\$ 25 + usage
20 hours	\$ 28
60 hours	\$ 35
140 hours	\$ 48
300 hours	\$ 74
500 hours	\$ 106
Unlimited	\$ 236
Usage charge: \$ 0.02 per minute at peak rate and \$0.01 per minute at off peak rates. If users go beyond the time included in their chosen tariff package they pay these usage charges.	
Connection charge is \$ 125 (excluding inside wiring and equipment installation).	

1. Tariffs for Maryland as of 1 August 1996. Previously users paid \$ 28 per month plus \$ 0.02 per minute during peak times and \$ 0.02 per minute during off peak times.

Source: Bell Atlantic.

### **Importance of Local Telecommunication Competition for Traditional and New Services**

Government liberalisation of telecommunication markets has taken place from two distinct starting points. The first wave of liberalisation occurred with the equipment and facilities that customers of PTOs were allowed to connect to the PSTN. This aspect of the liberalisation largely commenced in the 1960s, carried on through the 1970s and was completed in the 1980s. The underlying motive behind policy reform was to take into account the technological convergence of communication and information technologies. The trend was first evident at network boundaries as users became increasingly frustrated with regulation that restricted their ability to connect new technologies to the PSTN. The case often cited as the first to raise this issue was triggered by the application of a Texas electronics firm to connect an acoustic coupling device known as the 'Carterphone' to the PSTN in the US.<sup>33</sup>

More generally the FCC responded to the growing need for liberalisation of equipment by initiating the "First Computer Inquiry". At the heart of this inquiry was the question of whether a single telephone equipment supplier could serve the needs of the computer industry. As the use of information technologies rapidly expanded the need for liberalisation became apparent in all OECD countries. Today the benefits of liberalisation of the equipment and facilities users can connect to the PSTN are readily apparent and have enabled this segment of the communication market to become extremely dynamic, and arguably the most competitive segment of the telecommunication industry. Today one of the fastest growing market for technologies that route traffic is not at the core of the PSTN, but in technologies that route traffic over leased lines and at the periphery of networks. One of the largest companies supplying such equipment is Cisco Systems, a company that continues to highlight the benefits it receives from the liberalisation of telecommunication markets:

"An important trend influencing demand for the Company's products is the worldwide phenomenon of the Internet. The Internet is a network of networks, consisting of thousands of sub-networks and computer resources linked together. Cisco's high-performance routers are widely used in the "backbone" infrastructure of the Internet, and the Company believes that 80 per cent or more of all routers on the Internet are its products. In addition, the demand by companies, institutions and individuals for access to the Internet is spurring demand for remote access, switching and routing products of all kinds. The Company also benefits from the Internet

phenomenon through its alliance relationships with numerous Internet service providers. Another significant factor affecting internetworking is the global trend toward deregulated telecommunications and the resulting increase in use of higher-performance telecommunications services. Cisco has alliance relationships with a majority of the world's telecommunications carriers".<sup>34</sup>

A second wave of telecommunication liberalisation, largely commencing in the 1980s with the divestiture of AT&T, came with the liberalisation of national and international telecommunication in the US closely followed by Japan and the UK. This process has also brought demonstrable benefits in a growing number of OECD countries and made this segment of the telecommunication market by far the most dynamic for the provision of services.<sup>35</sup> Liberalisation of national and international telecommunication markets forced PTOs to become more responsive to customers. It opened up the peripheral networking market for equipment and service suppliers and enabled facilities to be linked via leased lines with greater capacity and at lower prices than monopoly markets. One example of a company which has taken advantage of this liberalisation is MCI which reported in mid-1996:

"The company continues to capitalise on the exploding client/server marketplace, becoming a dominant force in virtual data services like Hyperstream frame relay and Internet based services, both of which have posted triple digit growth over the last year ... Through its partnerships with Microsoft, Intel and Digital Equipment, MCI continued to focus on corporate Internet and Intranet applications. Internet revenue growth this quarter increased 200 per cent from the year-ago quarter and is on track to meet MCI's goal of US\$ 2 billion in revenue by the year 2000."<sup>36</sup>

Largely commencing in the 1990s liberalisation of local telecommunication markets is the third and potentially the most important wave. Why does the liberalisation of local telecommunication markets carry so much importance? The main reason governments are increasing liberalisation of local telecommunication markets is because there is growing recognition that the same dynamism evident in other segments of the industry is necessary if information infrastructure goals are to be realised. Until very recently the local telecommunication market, particularly in respect to customer access networks, was not characterised by innovative technology, services or pricing. PTOs had little need to be innovative in local access networks because customers had no choice but to take their services. Instead they focused on those market segments where customers did have a choice or where competition was about to be introduced. Since demand from PTOs for innovative access technologies was relatively dormant, equipment manufacturers focused their attention on market segments that had already been liberalised such as mobile communication and equipment for local area networking.

More recently communication equipment companies have recognised that liberalisation will open a large and very dynamic market for local access networks. This is typified by a June 1996 agreement by Ericsson and Cisco Systems to work together on wireless Internet access services and by Nortel's backing of Ionica.<sup>37</sup> A similar motive lay behind a number of strategic purchases by one of Cisco's leading rivals, 3Com to augment its ISDN capabilities.<sup>38</sup> According to 3Com it is "... capitalising on what it views as a substantial opportunity in providing connectivity solutions to the small and home office markets and to the commercial remote access market which provides dial-up connectivity to users of on-line information services, value added networks and transaction networks".<sup>39</sup>

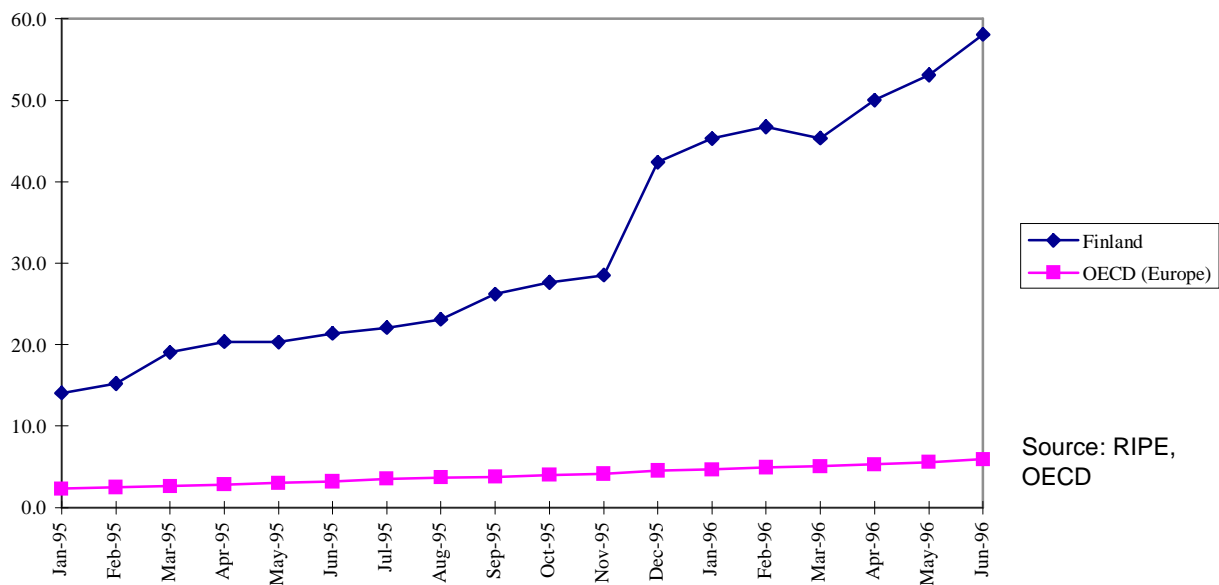
It was also one of the main reasons cited by AT&T for splitting off its communication equipment manufacturing arm. Renamed Lucent Technologies, the former AT&T company can sell local access equipment to companies that might otherwise have been wary of purchasing from a direct competitor.

What relatively new communication equipment manufacturers such as Cisco and 3Com and their more traditional telecommunication counterparts, such as AT&T, Ericsson and Nortel, realise is that with liberalisation demand for local access technologies is going to rapidly increase as:

- national and international operators with formerly limited access to local markets seek direct network access to customers;
- start-up PTOs seek to offer a full range of telecommunication services by seeking to build networks from the bottom up;
- alternative infrastructure providers, such as cable communication networks, seek to transform their networks to offer additional services;
- communication users seek more efficient access to networks, particularly for new services such as Internet and other information services.

The final point of the four mentioned above perhaps best typifies why increasing demands will be placed on governments to speed up reform to telecommunication regulation. If governments want to see the potential benefits of information infrastructure realised, in areas such as health and education, then telecommunication users must have efficient access to services via local networks. Business and residential users must be given greater freedom to select which service supplier can best serve their needs. Too often government discussion and action on information infrastructure is side tracked into debate or promotion (via tax payer supported subsidies or regulatory requirements on PTOs) of different access technologies (e.g. fibre optic cable, ISDN). By way of contrast those governments that have focused on policy reform, and in particular liberalisation of telecommunication markets, to create a framework for suppliers and users to increase efficient access to information infrastructure are reaping the greatest rewards.

**Figure 1: Internet Hosts per 1000 inhabitants**



The best current example of a government undertaking such reform is in Finland where all telecommunication markets have been liberalised. The introduction of competition into the Finnish telecommunication market has given that country best practice pricing and leading introduction of new communication technologies. One example is access to Internet services as measured by the number of Internet hosts (Figure 1). Finland added more hosts per thousand population in the single month of June 1996 than nine European OECD countries have added in entirety since their first Internet connection was made. All these latter countries have monopolies over the provision of infrastructure for the PSTN. The factors contributing to faster growth of Internet use in one country or another can be debated but seamless infrastructure competition in all telecommunication segments is clearly benefiting Finland in expanding access to information infrastructure. One reason for this is lower prices but another is in improved marketing of services to consumers -- evident in the pre-Christmas 1995 Internet growth in Finland.

## **MARKET SHARE AND BOTTLENECK CONTROL OF CUSTOMER ACCESS NETWORKS**

When the first wave of PSTN infrastructure competition was introduced in the mid 1980s by Japan, the US and UK it was almost wholly national and international in nature. New market entrants largely competed for customers purchasing 'long distance' telecommunication services. In the main, new market entrants did not provide local telecommunication service and used the customer access networks of incumbent PTOs to originate and terminate their traffic. More than a decade after the introduction of PSTN competition in the OECD area more than 99.6 per cent of all telecommunication mainlines are still provided by incumbent PTOs.

Even in liberal markets, for a variety of reasons, some PTOs were not allowed to offer certain services to telecommunication users. For example, in some countries there were demarcations between local, national and international service provision. In other words the PTO that provided a customer's telecommunication line might not be able to offer international calls and vice versa. However in reforming telecommunication markets the main regulatory trend is toward 'seamless service provision' (Table 7). New market entrants, and PTOs previously restricted to certain market segments, are generally being invited to compete across the whole spectrum of telecommunication services leading to a greater harmonisation between OECD countries with liberal markets.

One legacy of the different market structures in OECD countries with competition, for analysis of the telecommunication development, is that gains and loss of market share in certain industry segments can be compared. In broad terms this means it is possible to analyse what impact control of customer access networks (i.e. the provision of local telecommunication service) has had in countries with different market structures. The main purpose of this analysis is twofold. First is to show what the incentives might be for new market entrants in terms of building their own access networks. Second is to reinforce the importance of open and equal access regulation in the face of bottleneck control of customer access networks inherited from many decades of monopolistic regulatory environments.

### **Merging Regulatory Streams**

Where incumbent PTOs, or the entity resulting from restructuring associated with liberalisation, provided a full range of telecommunication services prior to liberalisation (Australia, Canada, Denmark, New Zealand, Sweden and the UK) new regulatory environments have enabled entrants to compete across all services (local, long distance and international). This has been the most common starting point, in terms of market structure, for liberalisation.

By way of contrast, for a number of other countries the provision of telecommunication services has not been undertaken on an 'end to end' basis. In these countries regulatory demarcations have existed, and sometimes they are still in force, which define which PTOs can provide different elements of telecommunication service. This has meant PTOs providing local service may not necessarily have provided national or international services (Finland, Japan, the US). The same situation is true of Chile, an APEC member, that has liberalised PSTN services in advance of most OECD countries.

In the US the divestiture of AT&T created divisions between regional service and long distance service (national and international). These divisions were largely aimed at enabling fair and equal competition in the long distance and international markets by ensuring that there was a separation between these services and the provision of local service. To date, these remain the only geographical PSTN restrictions (i.e. excluding restrictions in adjacent markets such as mobile communication or cable television) that have been introduced by an OECD country to coincide with liberalisation.

In other countries the divisions between services, as defined by geography, were inherited from the previous monopolistic demarcations. In Japan a demarcation concerning NTT and KDD only, which existed prior to liberalisation, was maintained, for much the same reasons as those in the US. This allowed new competitors to KDD, the incumbent international PTO, to provide services on a fair and equal basis to the subscribers of the national carrier (NTT). At the national level, however, new market entrants had to compete directly against NTT, the incumbent carrier owning and managing virtually all local access networks.

In retaining the division between national and international services Japan's policy, like that of the US, was in contrast to the approach taken by Australian and Canada. In these countries there had also been a geographical demarcation between the provision of national and international services prior to liberalisation. In Australia policy makers chose to merge the two government-owned carriers that provided national and international PSTN services (Telstra). In Canada, much the same process occurred through the Stentor member companies investing in Teleglobe, the carrier responsible for traffic to all international destinations apart from the US. As a result the new market entrants in Australia and Canada are competing against incumbent carriers which own the bulk of customer access facilities.

When Finland liberalised its market it chose to end any division between the provision of long distance services (national and international) and regional services by allowing all carriers to compete in each others' markets. However what really distinguished Finland from the situation that existed in Australia, Canada and Japan was that the divisions between regional, national and international service were not symmetrical. Prior to liberalisation, in 1994, Telecom Finland provided long distance services (national and international) on a monopoly basis. Telecom Finland also provided around 27 per cent of the local subscriber lines in that country mainly in rural and remote areas. The remaining 73 per cent of local access lines were provided by the members of the Finnet Group (formerly the Association of Telephone Companies or ATC).<sup>40</sup> There are more than 40 private telecommunication carriers in the Finnet group.

Due to the market conditions inherited from monopoly environments, and those created or maintained in order to stimulate fair competition, it is possible to categorise OECD countries into two distinct groups. On the one hand are those countries in which new entrants are competing against incumbent PTOs that own the overwhelming majority of customer access networks. On the other hand are those countries where PTOs which own the bulk of the local access networks have been prevented from entering certain markets (or subsequently allowed to enter new markets against the incumbents). As a result it is possible to correlate the development of market share with the absence or presence of one or another PTO controlling the bulk of customer access facilities. In summary it is possible to test how quickly:

- PTOs owning and managing the majority of local access networks, but previously precluded from other markets, gained long distance and international market shares from incumbents;



- new market entrants gained long distance and international market shares against PTOs controlling local access networks;
- new market entrants gained long distance and international market share against PTOs not controlling local access networks.

**Table 7. Liberal Market Structures and Regulatory Demarcation**

Country	Incumbent PTO(s) providing more than 70 per cent local access lines	Former Regulatory Boundary for PSTN Service	Current PSTN Geographical Demarcation
OECD			
Australia	Telstra	National(1)	None
Canada(2)	Stentor Group	National/US (Int.)	None
Denmark(3)	TeleDanmark	Regional	None
Finland(4)	Finnet	Regional	None
Japan(5)	NTT	National	National
New Zealand	Telecom	None	None
Sweden	Telia	None	None
UK	BT	None(6)	None
US(7)	RBOCs/GTE	Regional	None (subject to certain criteria being met)
Non-OECD			
Chile(8)	CTC	Regional	None

1. Prior to 1991 Australia's national and international PSTN services were provided by separate government owned carriers (for respective services Telecom Australia and OTC). These carriers merged to become Telstra.
2. Traditionally the Stentor Group of member companies has provided the majority of local and national service but international service only to continental United States. Other international services have been provided by Teleglobe, a company in which the Stentor companies are major shareholders, on a monopoly basis. The Canada-US services market is open to full infrastructure competition. This distinction will be eliminated with the end to Teleglobe's monopoly.
3. TeleDanmark was formed by the merger of five independent PTOs (with interlinking and a mix of public and private ownership) -- four with geographically defined areas of operation and a fifth that provided national and international service.
4. Finnet is an association of regional PTOs. Prior to market reform being introduced in 1994, Telecom Finland provided 27 per cent of the local access lines mostly in rural areas, had a monopoly on national long distance and international PSTN services.
5. In Japan the provision of national and international services are separated only in Laws relating to NTT and KDD.
6. Telecommunication in the City of Hull is provided by Kingston Communications. BT is not permitted to provide service in this area.
7. The seven RBOCs came into existence after the divestiture of AT&T in 1984. Local service is also provided by several hundred smaller independent PTOs. In February 1996 new legislation came into force ending geographical restrictions on local exchange carriers subject to certain requirements being met.
8. CTC (Cia. de Telecomunicaciones de Chile) provides 95 per cent of all telecommunication access lines in Chile.

Source: OECD.

## National Markets

The different regulatory starting points in OECD countries which have liberalised their telecommunication markets allow an interesting comparison to be made between how much market share has been obtained by new entrants under different market structures. In national markets for long distance switched traffic the available evidence indicates that until 1995 new entrants in the US market were able to capture the greatest amount of market share (Table 8, Figure 2). Of the group of OECD countries shown the US was the only country to have a separation between local access and long distance service provision following liberalisation of the national long distance market. The separation between local and national long distance markets would appear to have made it much easier for new entrants to gain an immediate base which they have consistently built on over a decade. Data is not available for the period 1982-1984 to show how quickly carriers, such as MCI and Sprint, gained market share after the divestiture of AT&T was announced. In all other markets, with the exception of Finland and Chile (discussed below), new entrants faced incumbents with bottleneck control over local access networks.

In Japan, and the UK, new telecommunication carriers gained market share at a much slower rate than in the US even after allowing for the later starting date of liberalisation. Japan's new entrants have gained a greater market share than Mercury in the UK over roughly the same time period. One obvious difference between the Japanese and UK experience was that in the UK only one competitor to BT was allowed. The available evidence suggests duopolists in the UK and Australia have been slower to win market share than new entrants in open markets. The pace at which competitors to BT are winning national long distance market share has certainly increased since the end of the duopoly.

For other countries where new entrants faced incumbents with control over the bulk of customer access networks no one has been able to match the performance of the new US market entrants, although technological development and new regulatory practices appear to have made this process less arduous than for the pioneers of competition. In New Zealand, Clear Communications seems to have gained market share in its first two years equivalent to that of the US carriers but, as with Japan, the concentration of traffic may have been more focused along specific routes (e.g. Tokyo/Osaka, Wellington/Auckland). One of the outstanding features of the performance of new entrants in the US is that they captured market share in a country with the most widely distributed traffic patterns of all OECD countries.

While the evidence indicates that new carriers gain market share at a slower rate when faced with an incumbent controlling the local loop, what happens when a local loop incumbent is allowed to enter a long distance market from which they had previously been barred? In the OECD area the only instance to date where this has occurred is in Finland (although under the new telecommunication regulatory regime this will soon be the case in the US) and, outside the OECD area, in Chile.

Long distance markets were opened to competition in Finland on the 1 January 1994. In 1996 three principal companies offered long distance services. Telecom Finland, the state-owned former long distance monopolist, is pitted against Kaukoverkko Ysi (part of the Finnet Group) and Telivo (a subsidiary of the power company IVO). Telivo started operations in mid-1993 and Kaukoverkko Ysi in January 1994.

After a year of competition Finnet, the consortium of privately owned local telephone companies, had captured a market share of 56 per cent for long distance traffic. Telivo had a further 4 per cent of the market and Telecom Finland's share had been reduced to 40 per cent. Telecom Finland's competitors had won a market share far in excess of the experience of the rivals to BT and NTT in a fraction of the time. The principal difference was that Telecom Finland's main rival in the long distance market, the Finnet Group, provided 73 per cent of the local access lines while Telecom Finland provided

27 per cent. By way of contrast Telivo, starting without its own customer access network a gained market share consistent with new market entrants in other OECD countries. Finnet says its successful entry into the long distance market was due to its access to customers:

“Customer access is of primary importance in today's competitive market. The local telephone companies operate more than 70 per cent of all subscriber lines in Finland. Subsidiary companies handle nation-wide GSM mobile services, mobile trunking networks, several types of data communication networks, a national long distance network (100 per cent fibre optic), CATV networks and international telecommunications. The whole group accounts for nearly 45 per cent of the total Finnish telecommunications market. Many of these subsidiaries are new entrants to the market, for example, the long distance operator (Finnet Nine) launched services on 1 January 1994. After only a matter of days, the company captured around 50 per cent of the market!”<sup>41</sup>

What the cases of Finland, Japan, the UK and US show, although starting from different points, is the tremendous importance of owning and managing access to customers. Both BT and NTT could retain market share because of their control over local access while in Finland, the Finnet companies were able to capture a huge market share overnight because of their greater access to customers, some of whom were direct owners of private local telephone companies, than the incumbent long distance monopolist. Finnet's long distance market share after one year was more than four times greater than Mercury's share after 10 years. Perhaps a more valid comparison for Finland is with Sweden where after the first year of providing national PSTN services Tele-2, competing against an incumbent with virtually all the local access lines, had a 6 per cent market share.

Although the figures for Chile are included in Table 8 they are difficult to interpret. This is because although the official starting date for competition was in August 1994, CTC and its subsidiary (CTC-Mundo) had been allowed to enter some markets as early as 1992. Although Figure 2 wholly attributes CTC's market share to one year (because unofficial market share data is not available prior to that date) it is believed that CTC share in 1994 was around 15 per cent. The other 85 per cent of traffic was carried via ENTEL's long distance network. After the official opening of competition CTC is reported to have gained 31 per cent of market share in areas where the company owns the local access networks and 20 per cent in those areas where it has not traditionally provided local service. This difference alone provides strong evidence of the strategic importance of owning and managing customer access.

The situation is further complicated by the fact that the Chilean regulator has imposed a cap on the amount of market share CTC is able to gain in the first four years. In a little more than one year of open competition CTC had a 31 per cent market share but this was in a situation where the company was not allowed to exceed 35 per cent in the first year. The ceilings for successive years (45 per cent in year two; 55 per cent in year three; and 60 per cent in year four) suggest the regulator believes control over customer access networks will allow CTC to rapidly win market share. Overall it would appear to be the case that CTC has had little difficulty in gaining market share where it owned and managed the local access network.

One more point is critical in discussion of the development of market share in long distance markets. Although it is often overlooked in discussion of long distance market shares between incumbent PTOs and new rivals, a great deal of the revenue won by new market entrants still flows to the incumbent PTO via interconnection payments for use of local networks. Access costs make up 46 per cent of MCI's revenue. When this access revenue is added to the tremendous revenue growth stimulated by competition, that has been evident in all OECD countries with liberal markets, the owner of the existing access network fares much better than may be initially assumed. What can be portrayed as a loss of market share is often an overall gain in revenue and profitability for the incumbent PTO. In Australia the CEO of Telstra noted

in August 1996, “We have lost 25 points of market share and we are still reporting record earnings every six months”.<sup>42</sup> Competitors to PTOs are also major customers meaning that as markets are liberalised new opportunities arise for the sale of underlying infrastructure and for reductions in cost of services purchased from other PTOs. For example Sprint Corporation notes in response to the new US Telecommunication Act:

“Sprint should benefit from the opportunity to enter local telephone markets. The new competitive environment should lead to a reduction in local access fees, the largest single cost in providing long distance service today. The risk aspect of local competition is that historical prices and market shares of Sprint's local telephone companies (approximately 4 per cent of the nation's local telephone access lines) are likely to decline. The removal of the long distance restrictions on the RBOCs is not anticipated to have an immediate significant adverse impact on Sprint because of the substantial preconditions that must be met before RBOCs can provide most in-region long distance services. In addition, Sprint could potentially offset some losses of long distance customers at the retail level if it were successful in becoming the underlying carrier for resellers (including the RBOCs) entering the long distance market”.<sup>43</sup>

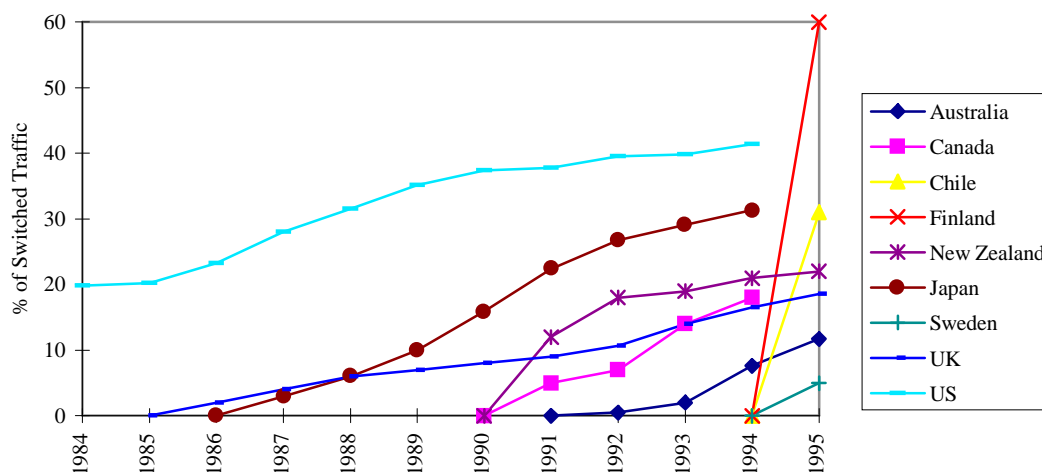
**Table 8. National Long Distance Market Shares of New Operators**  
(Share of Switched Minutes - Per cent)

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
OECD												
Australia(1)								0.0	0.5	2.0	7.6	11.7
Canada(2)							0.0	5.0	7.0	14.0	18.0	
Finland(3)											0.0	60.0
NZ(4)							0.0	12.0	18.0	19.0	21.0	22.0
Japan(5)			0.0	3.0	6.0	10.0	15.9	22.4	26.8	29.1	31.3	
Sweden(6)											0.0	5.0
UK(7)		0.0	2.0	4.0	6.0	7.0	8.0	9.0	10.7	14.4	16.5	18.6
US(8)	19.8	20.2	23.2	28	31.5	35.1	37.4	37.8	39.4	39.8	41.4	43.5
Non-OECD												
Chile(9)											n.a.	31.0
Market Cap.												35.0

1. Australian data is an OECD estimate based on data published by Optus for its total market share (national and international long distance) for switched minutes.
2. CRTC and Economic Research Associates.
3. Combined share of Kaukovertko Ysi and Telivo. Source: Ministry of Communications.
4. Market share for Clear Communications as at March the following year (Source: Clear Communications, TCNZ).
5. Data for Japan is the combined share of NCCs inter prefecture traffic as measured by number of calls. Official figures are published from 1990 - 1994. Earlier data are OECD indicative estimates. (Source: MPT).
6. Source: Telia.
7. UK data is from Oftel for 1992-1995. Official data were not reported before this date and the prior figures are OECD indicative estimates. Data are market share for all carriers competing with BT and Kingston. Data are for end of March for corresponding year except 1995 which is the end of the second quarter.
8. US data is the combined market share of all carriers other than AT&T as reported by FCC.
9. Data for Chile is for CTC. Unofficial market share data is not available prior to the official commencement of liberalisation in 1994. (Source: Flemings Research).

Source: OECD

**Figure 2 : Long Distance Market Share for New Entrants**



### International Markets

In international PSTN markets the available evidence confirms the experience of national PSTN markets for countries which liberalised during the 1980s. The separation between local access networks from the provision of international services appears to have been a major factor in enabling carriers in the US and Japan to gain a greater amount of market share than the UK over the same period (Table 9, Figure 3). On the other hand in those countries which introduced competition during the 1990s, new carriers in Australia, New Zealand and Sweden have all gained market share relatively rapidly despite facing an incumbent with control over the local access network. Yet despite this growth (perhaps due in part to technological and regulatory advances) new carriers in these countries have not been able to match the performance of Finnet in Finland or CTC in Chile. In Finland competition in the provision of international services commenced in July 1994.

Although the situation in Chile is complicated by the same factors that exist in national markets (a market share cap of 20 per cent in the first year; 30 per cent in the second year and 40 per cent in the third year for CTC) as well as an existing 'unofficial' market share prior to the opening of the market to all carriers the available evidence appears to indicate that CTC has had difficulty in keeping its share below its allowable ceiling. More to the point Finnet International has gained 20 per cent and Telivo 6 per cent in less than one year, virtually matching the combined share of UK carriers competing with BT after eight years.

The experience outlined above for national and international markets suggest the RBOCs/GTE will be formidable competitors in the new US regulatory environment. Should Japan not break up NTT and allow the company to enter international markets it will also be in a position to build market share very rapidly. Perhaps more importantly maintaining the status quo in Japan will considerably slow the roll out of local competition and the boost this would provide to innovation in network access and services. On the other hand new market entrants in other OECD countries, without their own existing customer access networks, will have taken careful note of how much more difficult it is to win market share from incumbents with bottleneck control of existing access networks.

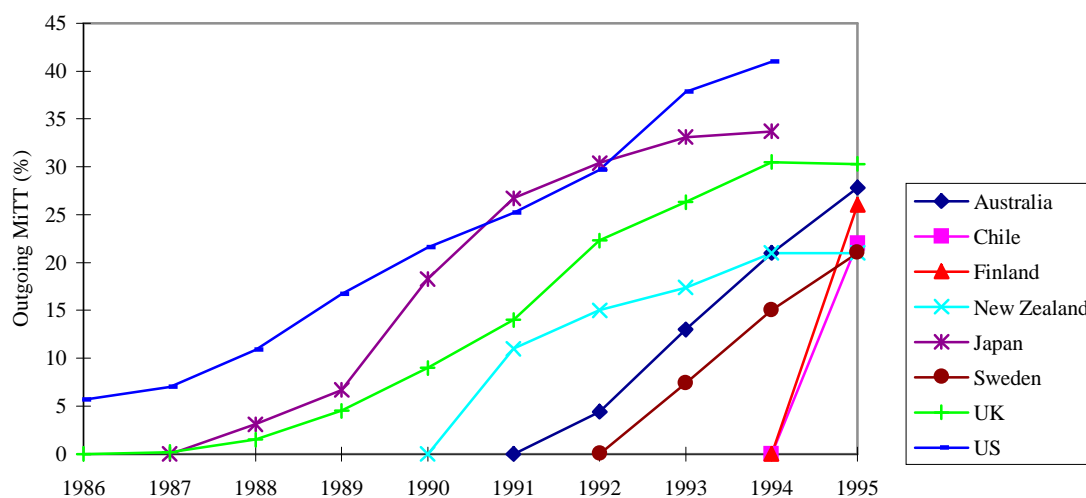
Table 9. **International Market Share of New Market Entrants**  
(Share of MiTT -- Per cent)

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
OECD										
Australia(1)						0.0	4.4	13.0	21.0	27.8
Finland(2)									0.0	26.0
New Zealand (3)					0.0	11.0	15.0	17.4	21.0	21.0
Japan (4)		0.0	3.1	6.7	18.3	26.7	30.4	33.1	33.7	
Sweden (5)							0.0	7.4	15.0	20.0
UK (6)	0.0	0.2	1.5	4.5	9.0	14.0	18.8	21.8	30.5	30.3
US (7)	5.7	7.0	10.9	16.7	21.6	25.2	29.7	37.8	41.0	
Non-OECD										
Chile(8)									N/A	22.0
Market Cap(9)										20.0

1. Australian data is from Telegeography and OECD estimates based on data published by Optus for its total market share (national and international long distance) for switched minutes. (Other sources consulted: BZW Australia, Telegeography).
2. Combined share of Kaukoverkko Ysi and Telivo. Source: Ministry of Communications.
3. Market share for Clear Communications for March of following year (Source: Clear Communications and TCNZ).
4. Combined market share for all NCCs. (Source: MPT, Telegeography).
5. Data for Sweden is the estimated market share of Tele-2. (Source: OECD, Telegeography, Cable and Wireless, Industry Interviews and Telia's Annual Report).
6. UK data is from Telegeography (1986-92) and Ofel for 1992-1995. Data are for the market share of all carriers competing with BT and Kingston. Data are for end of March for corresponding year except 1995 which is the end of the second quarter.
7. US data is the combined market share of all carriers other than AT&T as reported by FCC.
8. Data for Chile is for CTC. Unofficial market share data is not available prior to the official commencement of liberalisation in 1994. (Source: Flemings Research).
9. CTC's market share is capped by the regulator.

Source: OECD

Figure 3: **New Entrant's International Market Share**



## **Local Telecommunication Competition in OECD Countries**

Competition in local telecommunication markets is still fledgling in nature. That more than 99.6 per cent of customer access lines are still provided by incumbent PTOs in the OECD area, and an almost similar percentage of customers have no choice of service supplier, speaks for itself. However, the question of when a local telecommunication market can be said to be fully competitive is less clear cut. This issue is going to come increasingly to the fore as incumbent PTOs with bottleneck control of local access infrastructure seek to be released from competitive and consumer safeguards.

According to AT&T effective competition for local telecommunication services could be said to have developed when at least 75 per cent of customers can get local service from two or more providers, and when more than 30 per cent of customers have chosen a company other than the incumbent for local service.<sup>44</sup> While incumbent PTOs providing local telecommunication services and policy makers may take a different view, AT&T's proposal provides an interesting benchmark against which to assess developments. From the point of view of incumbents full competition at the local level will undoubtedly have arrived when a new market entrant wins their first customer. From the perspective of policy makers the first part of the AT&T criteria is likely to be considered most important in terms of specific telecommunication regulation -- that is how many customers have a choice of service supplier. More complex questions of market power derived from economies of scale inherited under monopoly operation will then take on more importance.

Clearly, by AT&T's criteria for customer choice, few countries in the OECD area would stand a chance of reaching such a benchmark by the year 2000 and soberingly some may not have commenced by that date. The Member country likely to first reach the goal of providing more than 75 per cent of consumers with a choice of service supplier, for all telecommunication services over alternative infrastructure, by the end of the decade is the UK. At this stage Australia and Finland look next most likely to reach similar proportions of customers with a choice of local service supplier with competing infrastructure, despite starting later than the UK. In Australia this is because of the rapid deployment of new cable infrastructure capable of supporting telephony by Optus Communications and in Finland because of Telecom Finland's use of fixed wireless technology.

In other countries with liberal markets the road toward full competition will depend on how quickly existing cable infrastructure can be upgraded to offer a full range of telecommunication services or new access technologies such as fixed wireless networks take to be deployed. Choice is also expected to arrive earlier in some countries via resale of unbundled local network elements. In countries with monopolies it will depend on how soon restrictive regulation is lifted. This is particularly true of OECD countries with relatively low telephone penetration rates where local competition is not just about choice but in expanding access to basic services. At the moment monopoly regulation is holding back new market entrants from taking advantage of new technologies to expand access to basic telecommunication services.

### ***The Case of the United Kingdom***

In the OECD area competition in local telecommunication markets is most advanced in the UK. A growing number of business and residential users can choose whether they receive local telecommunication service from operators other than BT. For example a telecommunication user might elect to receive local service from a CCO, such as Telewest, or a fixed wireless operator such as Ionica.

In the UK the development of local telecommunication competition was triggered by the end of the long distance duopoly. Until 1991, BT and Mercury were the only companies licensed to provide long distance PSTN services. Although CCOs in the UK were technically able to provide local telecommunication service prior to 1991, in all but a few cases, this did not happen. The main reason for this was that the CCOs had to interconnect with BT or Mercury and hand over all long distance calls. Given the fact that BT owned an existing customer access network it was not in that company's interest to encourage the development of local access competition. At the same time Mercury's initial business strategy was to offer national and international services. Mercury only built direct connections for relatively high volume business users. For residential and small business customers Mercury offered these services through indirect lines provided by BT. With the end of the duopoly the incentives for the existing and emerging players in the UK market fundamentally changed.

For the CCOs the end of the long distance duopoly meant they could offer a full range of telecommunication services. In other words if they constructed customer access facilities they could provide local, national and international services. Moreover infrastructure needed to connect local networks was no longer confined to BT and Mercury. CCOs had an increasing range of companies from which to lease facilities or they could build their own long distance infrastructure. If franchise areas were adjacent they could simply link networks or work co-operatively with other CCOs to achieve the same purpose. The other element of UK regulation, in terms of market structure, cited by the CCOs as critical was the restriction on BT utilising its network for broadcasting.

Since the end of the duopoly in the UK, and the beginning of 1996, CCOs have added 1.4 million telecommunication subscribers (Table 10). By 1996 CCO investment in the UK totalled US\$ 7.8 billion of a projected US\$ 18.7 billion.<sup>45</sup> During 1996 customer lines have been added at a rate in excess of 60 thousand per month. As impressive as these growth rates are it has taken the CCOs in the UK five years to install the equivalent of 5 per cent of BT's total access lines. By the year 2000 the Cable Communications Association (CCA) estimate that 5.7 million lines will be in operation (Table 11). If this target is reached CCOs may have an equivalent in the order of 20 per cent of BT's access lines. Much more importantly, by the year 2001, more than 70 per cent of existing households and a higher percentage of small businesses will have a choice of local telecommunication service provided by a CCO.

Indeed, increasing customer choice, rather than market share gains of any particular company, is a major goal of policy reform. This is why the entry of Ionica in the local telecommunication market is a very interesting and positive development (Box 3). By the year 2001 Ionica aims to provide the opportunity for customers to take their service to around 75 per cent of the UK population. If this target is reached Ionica will have provided a third choice for local telecommunication access in record time. Indeed at the speed which this is expected to happen, similar to the fast pace at which mobile networks can be rolled out, it augurs well for the development of competitive access in other OECD countries. At the same time, due to the nature of the technology employed, a much lower penetration rate is required to break even than for a CCO.

Telewest, the largest CCO in the UK, recorded a loss in 1995 due to the high initial investment cost in building a wireline customer access network. This was in line with Telewest's expectations and reflected the costs involved in the rapid expansion of the company's network. However capital expenditure costs per customer dropped sharply as the number of customers served increased. In terms of homes passed Telewest had a residential telephony penetration rate of 26 per cent and a cable television rate of 21.9 per cent by the end of 1995. Accordingly Telewest's experience demonstrates that even with a relatively high penetration rate and two revenue streams (telephony and cable-TV), it takes considerable time for a wireline operator to reach a break even point. By way of contrast Ionica projects a break even



point with two per cent market penetration and is expected to be well into profit if it reaches its goal of one million customers five years after commencing service.

Ionica's initial service commenced in the 'Anglia area' of the UK in May 1996. While Ionica intends to roll out service opportunity to 75 per cent of the UK population by 2001 the choice of initial service areas is driven by marketing. The Anglia region refers to an area in the UK served by Anglia television. It is one of a number of such areas in the UK divided by the allocation of commercial television licences. The main reason for gradually building a Fixed Radio Access (FRA) network according to commercial television regions is the need to efficiently market services to customers. One of the difficulties faced by CCOs in entering a new market is that they must be able to provide service to most potential customers in an area before advertising their services on television. If they do not have facilities available for customer connection CCOs risk customer dissatisfaction because they can not deliver an advertised service. In contrast an FRA service such as Ionica can build potential coverage in a shorter time and have service available to virtually all customers. As a third operator entering the residential telecommunication access market Ionica can also expect to benefit from customer awareness of choice in telephone service created by the CCOs.

One of the main benefits of competition in telecommunication has proven to be innovation in pricing. The pricing of telephony by CCOs in the UK has introduced not only lower prices but a growing number of innovative pricing options. The benefits of CCO pricing in the UK have been described in several OECD publications<sup>46</sup>. Typical of such innovations are greatly reduced prices for installation and free cable to cable customer calls in off peak hours. Some CCOs also offer discounts on telecommunication service if taken with cable television.

Ionica's pricing of FRA is extremely innovative compared to virtually all PTOs in the OECD area. Perhaps the most striking innovation by Ionica has been to offer customers a money back guarantee if they are not satisfied with the service they are receiving after 3 months. More generally tariffs for all telephone calls have been set 15 per cent below BT's standard rates. In other words Ionica's rates are 15 per cent less expensive before any BT discounts or promotional offers are taken into account (Table 12). On the other hand most discount schemes for call charges offered by traditional PTOs involve a customer paying a slightly higher rental. Sometimes this requirement is imposed on the incumbent PTO because without a higher rental being charged the discount would have to be passed on to all customers. On the other hand discounts for schemes that involve frequently called numbers in return for higher rental charges are generally designed for PTOs to compete against other market entrants without their own customer access networks. If rivals own customer access networks higher rentals are less likely to be part of the scheme. Hence Ionica's discounts for usage charges and rental charges -- at the same time -- are very distinctive.

Ionica's discount from standard BT charges of 20 per cent on the rental of a first line and 40 per cent on a second line are substantial and, particularly in the case of the second line, reflect the benefits of FRA technology. Customers can have second lines on demand given the nature of FRA technology. Installation costs are also priced considerably below those of BT. However the advantage of Ionica pricing is not as great as may seem at first glance. Only a relatively small percentage of BT customers pay the full cost of connection because they are commencing service from a residence that already has a line for which the charge is much lower (Table 13). Indeed if they take over service on the same day they pay no charge. On the other hand, for policy makers concerned to develop universal service, lower prices for installation of new lines are a major benefit even if only for a relatively small per cent of the population not served by existing access line infrastructure. For the 16 per cent of BT residential customers per annum needing new lines installed the lower price could be a considerable boon.

Another distinctive feature of Ionica pricing is the offer of advanced features as part of the standard telephony package (e.g. such as Call Barring and Caller Line Identification), for no additional charge. In fact if a subscriber were to take all the advanced services made freely available by Ionica from the incumbent they would pay an additional US\$ 28.03 -- nearly as much as Ionica's first line rental. Interestingly at a time when many countries with monopoly PTOs are debating what services should be part of basic service, in terms of universal service, here is a case of a new entrant offering advanced features at a lower price than the incumbent. Moreover new services not yet available from BT in the UK market have been introduced (i.e. distinctive ringing and allocated billing).

Apart from the benefits for domestic services the UK is realising from local telecommunication competition the country has also gained new production plant, jobs and export markets. The correlation between 'home market' liberalisation in the field of mobile telecommunication and the leading success of companies such as Ericsson and Nokia, while coming from relatively small countries, has been noted.<sup>47</sup> Liberalising local telecommunication service gave Ionica the opportunity to develop FRA technologies and the company subsequently licensed export markets to Northern Telecom (Nortel). Nortel has built a US\$ 62 million production plant in Devon, in the South of the UK which is expected to provide 1 000 jobs.<sup>48</sup> Initial foreign sales of 'Proximity I', Nortel's trade name for the FRA technology, have been made to Cable Plus (in the Czech Republic), Columbia Telecom, Lanka Bell (in Sri Lanka) and the Vietnamese telecommunication authority, Ho Chi Minh P&T.<sup>49</sup> The technology is also being deployed by Telecom Finland, a part owner of Ionica, and Scottish Telecom.

Table 10. **Cable Communication Growth in the UK**

	Homes passed and released to marketing	Homes connected to cable TV	Cable TV household penetration %	Total telephone exchange lines	Monthly growth of telecommunication subscribers	Cable Telecommunication lines as a % of total BT lines
Jan-86	66238	7523	11.4	0	0	0
Jan-87	143066	19758	13.8	0	0	0
Jan-88	276671	40609	14.7	0	0	0
Jan-89	426056	62728	14.7	0	0	0
Jan-90	557193	87062	15.6	0	0	0
Jan-91	828227	148948	18.0	2224	185	0.0
Jan-92	1332478	267430	20.1	21225	1583	0.1
Jan-93	1937501	434458	22.4	109133	7326	0.4
Jan-94	2778067	610256	22.0	312222	16924	1.2
Jan-95	4116212	915592	22.2	741146	35744	2.7
Jan-96	6042296	1326042	21.9	1419819	56556	5.2

Source: CCA, BT, OECD.

Table 11. CCA Projected UK Cable Communication Growth

	Homes Passed (millions)	Cable TV subscribers (millions)	Cable TV penetration (%)	Residential telecommunication lines (millions)	Business telecommunication lines (millions)
1996	9.7	2.81	29	1.8	0.15
1997	11.5	3.91	34	2.5	0.20
1998	12.5	4.88	39	3.4	0.31
1999	13.5	5.94	44	4.2	0.46
2000	14.5	7.11	49	5.0	0.70
2001	15.5	7.91	51	NA	NA

Source: CCA (January 1995 estimates).

Table 12. Ionica Tariffs

	Ionica (US\$)	BT Standard Rate (US\$)	Difference with BT standard residential rate (%)
Usage charges	Ionica's Local/National/International tariffs are all 15% below BT's standard rate.		15
Connection 1st line (2)	54.52	181.20	70
2nd line	54.52	181.20	70
Rental 1st line	29.66	38.61	20
2nd line	22.24	38.61	40
included in rental as part of standard service			
Distinctive ringing	No extra charge	Not available	--
Call Barring	No extra charge	10.90	100
Call Divert	No extra charge	10.90	100
Caller Display	No extra charge	6.23	100
Allocated billing	No extra charge	Not available	--
Services with additional charge			
Voice mail(3)	6.23	7.79	20
Three way calling	4.98	6.23	20
Call waiting	4.98	6.23	20

1. All charges include value added tax. No BT discounts or promotions are included in this comparison and rates are at 24 April 1996. Ionica says a saving of \$ 18.63 per annum is available for payment by direct debit.
2. BT's connection price is for new lines installed on separate days.
3. Ionica offers free voice mail for the first 6 months of service.

Source: Ionica.

Table 13. BT Installation Prices

	Charge Paid (US\$)	Business Customers (%)	Residential Customers (%)
New Line Installation	154.20	52.1	16.0
Take over of existing line	13.24	33.4	50.0
Take over of existing line on the same day	0.00	14.5	34.0

1. Charges exclude VAT of 17.5 per cent.

Source: BT.

### Box 3: Ionica

Ionica was founded in 1991 following the end of the duopoly in the UK long distance PSTN market. The company was granted a PTO licence in 1993 and since that time has raised capital in the vicinity of US\$ 240 million. Ionica utilises a digital radio technology called Fixed Radio Access (FRA). Residential and business customers are connected to an Ionica base station via a radio link operating at frequencies between 3425 and 3490 MHz, where a total of 30 MHz has been allocated for Ionica's exclusive use in the UK. The distance between a customer and a base station can be up to 15 km (or more in certain circumstances) albeit in practice service areas tend to be smaller (size varies with factors such as topography and population density). Each base station can provide service for around 2000 customers and a typical service area might commence with four base stations. At the customer's site inside wiring is the same as with a traditional telephone service (with the exception of a connection of a power supply unit to the household mains and a rechargeable battery) and this is connected to a small antenna mounted on the roof of the premises. A residential customer would have a 30 cm diameter octagonal radio transceiver unit and a directional flat plate aerial mount on the roof of their home. Base stations are connected to telecommunication exchanges using conventional telecommunication links. These telecommunication exchanges perform all the traditional switching functions, enhanced calling features and call records for billing.

The main advantages of the FRA approach for a new market entrant are the potential to provide connections to customers at a lower price and to economically provide service in areas where one or more fixed network operators already provide service. Once base stations are installed service can be provided on demand in the area covered. Further marketing advantages derive from added service functionality that can be provided by FRA in the provision of additional customer lines on demand. In respect to the first advantage of the FRA approach provision of fixed wireless access is now widely believed to be less expensive than traditional wireline connections. Of course many variable factors need to be taken into account in any such comparison and in some service areas there will tend to be small geographical pockets not well served by FRA because of their positioning in relation to base stations. On the other hand network installation is much less labour intensive in comparison to fixed networks. More importantly for a new market entrant there is a relatively low initial investment.

Most capital investment for FRA occurs at the time equipment is placed on the customer's premises. In other words most costs are variable costs and revenue is gained as they are incurred. In principle this should mean that a FRA operator has lower external funding requirements and commercial risk. This is in contrast to wireline networks of new operators, for example in urban areas, where significant investment is required taking cable down an entire street although only a relatively small number of subscribers may opt to change service supplier. The other important aspect of using FRA is that it enables a new entrant to provide an important assurance to customers that prices set lower than the incumbent are sustainable. A problem for any new entrant into the local telecommunication market is convincing customers that once they take service prices will not be increased to match the incumbent over the longer term. While by emphasising wireless basis for service a FRA operator runs the risk of customers assuming it is providing mobile telecommunication, the technology also enables an explanation of lower prices. Due to the fact that consumers in a competitive market expect lower prices over time from the incumbent they must be assured that lower prices from new entrants are sustainable. The need to demonstrate credibility to customers in both pricing and quality is essential for a new operator with the latter being given as the reason Ionica offers a money back guarantee.

## *Updating Local Access Competition in other OECD countries*

### *Australia*

Australia has had a duopoly for the provision of PSTN infrastructure since 1991. The two licensed carriers are Telstra, which is the incumbent PTO, and Optus. In August 1995 their new policy principles for regulation, to apply from 1 July 1997, were announced. The duopoly over PSTN infrastructure provision will end at this time and there will be no limit on the number of persons who may install infrastructure or provide telecommunication services. Prior to 1995 there was no cable television infrastructure in Australia providing services to the public.

In 1995, after building a nationwide fibre optic backbone network, Optus Communications commenced the construction of a broadband customer access network capable of offering cable television, Internet access and telephony services. In June 1996 Optus launched its first local telecommunication service provided directly over its own infrastructure. Like new entrants in the UK market much attention was given to Optus pricing relative to Telstra. In Australia local calls made by Telstra customers, at standard rates, cost US\$ 0.19 per call. Local calls have a flat rate (i.e. the price of a local call is the same irrespective of its duration). Optus customers can make local calls for US\$ 0.15 and US\$ 0.12 during a number of public holidays such as Christmas Day. All Optus local call charges are also at a flat rate and effectively represent a 20 per cent discount to Telstra's standard rate and a 40 per cent discount on public holidays.

Optus plans to cover Australia's largest two cities, Sydney and Melbourne, and most of the third largest (Brisbane) by the end of 1996.<sup>50</sup> At this stage service will be available to 2 million households. Optus aims to pass 3 million households by mid-1998. At this time Optus will be in a position to market cable television, Internet access and a full range of telecommunication services to about half Australia's 6.1 million households via its cable infrastructure. Telstra is also rolling out a broadband network fibre/coaxial cable customer access network and aims to pass 4 million households by mid-1999. This has led to a great deal of analytical speculation over the incentives for both carriers to roll out broadband customer access networks.

For Optus the major advantages of owning and managing its own customer access network is the ability to provide local telecommunication services which represent about half Australia's US\$ 11.6 billion telecommunication market. Optus estimates local calls represent around one third of the Australian telecommunication market without taking into account rentals and connection revenue. Given Australia's flat rate pricing for local calls, and the rapidly growing popularity of Internet access in that country, Optus can also expect to take advantage of the growing demand for second residential lines and cable access at higher speeds than the PSTN. In terms of long distance telecommunication markets the new Optus network gives the carrier direct strategic access to customers which has proven so important in gaining market share in other OECD countries. The cost of the Optus rollout is projected to be US\$ 2.3 billion by mid 1998. Had Optus not decided in 1995 to build a customer access network, during the remainder of the duopoly period, the company would have faced growing competition for long distance services and would have had to rely on Telstra to provide access to customers.

One of the major investors in Optus is Cable and Wireless -- the majority owner of Mercury in the UK. Mercury has in the main not built direct access networks and since the end of the UK duopoly has faced growing competition for long distance services from new market entrants and an increasingly

efficient rival in BT. Moreover as the CCOs and Ionica gain market share they are providing long distance services to their customers. Due to its own network Optus will enter the post 1997 open market in Australia in a far different strategic position than Mercury did after 1991 in the UK.

Telstra's motives for rolling out a broadband network are interesting, not only in terms of developments in Australia, but because of the clues that may be given to the reaction of incumbents in other markets facing a challenge to their dominance in local access networks. Faced with a competitive threat to its customer access network Telstra is investing US\$ 3 billion to roll out a broadband access network. The new Telstra broadband network will give the PTO a platform to provide cable television and Internet access services although at present, and for the foreseeable future, these markets are very small compared to that for local and long distance telecommunication services. While Telstra's new network will also be able to provide telephony services, the company's existing PSTN access network already provides telecommunication service to around 96 per cent of Australian households. It would seem the investment is primarily driven by the existing market for telecommunication services. What the new broadband network enables Telstra to do is to defend its existing telecommunication market share by matching each service offered by Optus. Each customer that takes broadband services such as cable television from Telstra is also likely to be retained as a telecommunication customer for local and long distance service. In the UK this strategy has not been available to BT to compete with the CCOs because of certain regulatory restrictions on the use of its PSTN for broadcasting on a national basis.

In many other OECD countries, with monopolies over PSTN provision, PTOs are rapidly increasing their share of the cable television market ahead of liberalisation.<sup>51</sup> In these countries it is not clear that a second broadband network will be built once the incumbent has already rolled out a network or taken over existing infrastructure. These countries are in danger of missing a significant opportunity for local access competition via cable networks, although the opportunity for FRA competition will continue to exist. Indeed if demand for broadband services does not develop as fast as some expect incumbent PTOs will have to carry significant amounts of debt on cable networks while facing competitors with low cost access networks capable of delivering plain old telephony service -- by far the largest proven market.

### *Canada*

Canada has opened all PSTN markets but competition at the local level has in the main not yet commenced due to certain regulatory barriers in the provision of switched local telephone service.<sup>52</sup> CCOs in Canada can provide some telecommunication services and technically can provide switched telephony subject to regulated tariffs. The process of reforming regulation to enable effective competition at the local level is expected to be completed by the end of 1996.<sup>53</sup> Unlike Australia, Canada is starting from a position of having a very well developed cable television infrastructure in place prior to telecommunication liberalisation. By 1995 some 73 per cent of Canadian households subscribed to cable television service.<sup>54</sup> In urban areas 80 per cent of households have cable service while in rural areas 35 per cent of households subscribe to cable television.<sup>55</sup> In contrast to a growing number of OECD countries, but like the US, this infrastructure is independently owned by cable companies.

Given the existence of an independent platform for competition the Canadian Government is acting to encourage participation by CCOs in the local telecommunication market.<sup>56</sup> To provide telecommunication services Canadian CCOs would need to substantially upgrade existing networks and incorporate telecommunication facilities. However a major advantage they have over start-up CCOs is their existing relationships with customers (e.g. information data bases in areas such as billing) and attributes associated with physical infrastructure (e.g. ducts, poles, rights of way etc.). On the other hand the existence of unmeasured local calls and the fact that 99 per cent of Canadian households have telephone service would make any company take a pause before committing to major network upgrades.

At the same time the overall telecommunication market in Canada is profitable and very large relative to the cable market. In 1995 the Canadian telecommunication market was in the order of US\$ 14 billion compared with US\$ 1.7 billion for the cable television market.<sup>57</sup> Accordingly it is expected that Canadian CCOs will launch Internet access services in the near future (trials are now underway) and this will be followed by entry into the telecommunication market.

At present Canadian CCOs have time to plan their entry into telecommunication carefully. PTOs in Canada are restricted from offering direct cable television services (except in rural or underserved areas) and CCOs have existing basic infrastructure in place (unlike for example Optus). However Canadian government policy strongly supports the introduction of competition in all forms of communication. Accordingly the Canadian Radio-television and Telecommunications Commission (CRTC) has recommended that PTOs be allowed to provide cable television service as soon as the regulatory barriers to effective local competition in the provision of switched telephone service have been eliminated. The other development that is likely to spur CCOs is that the Canadian Government has licensed "LMCS" (local multipoint communications systems) and made spectrum available, in the first instance, to new players apart from PTOs and CCOs. In October 1996 LMCS licences were issued to three companies in Canada, all backed by broadcasters. In addition new entrants in the Canadian long distance market have expressed their intention to enter local markets. For example Call-Net, whose Sprint Canada is a long distance carrier, has formed a subsidiary called Call-Net Communications to enter local markets once the regulatory terms and conditions have been settled by the CRTC.<sup>58</sup>

#### *Denmark*

In Denmark the full liberalisation of PSTN competition is very recent commencing in July 1996.<sup>59</sup> Cable companies had technically been able to offer local telephony services since mid-1995, but could not offer services beyond municipal boundaries. Accordingly TeleDanmark was able to report no discernible loss of market share during 1995. TeleDanmark operates Denmark's largest cable television business.<sup>60</sup> Cable television, however, only contributes around 2 per cent of net revenue meaning that ownership may be more important in strategic terms than in actual revenue importance relative to telecommunication.

In 1995 Sweden's Telia acquired 94 per cent of the shares in Stofa A/S, the second largest Danish cable television company, and would appear to be a leading contender to provide competitive local telecommunication services. Telia says its Danish subsidiary, Telia A/S, aims to "...develop into a conventional, full service operator offering a range corresponding to the parent company's in Sweden".<sup>61</sup> As with other newly liberalised markets investment decisions on local access networks will no doubt be taken after the regulatory and commercial details interconnection arrangements have been worked out. Equal access to numbers and number portability is being worked on by the government.<sup>62</sup>

Interestingly, TeleDanmark believes that because there are few large industrial groups in Denmark relative to other European countries, but many small and medium sized companies, the market may be less attractive to other operators.<sup>63</sup> In fact TeleDanmark estimates that the Group's largest 100 accounts make up between 10-15 per cent of total net revenues. However it might also be pointed out the Telia's Megacom division, which handles around 90 of the company's largest corporate accounts, contributed only 9 per cent of Telia's total revenue.<sup>64</sup> This is despite the fact that Sweden has the headquarters of the leading number of Fortune 500 companies in Scandinavia. In most liberal markets while corporate accounts are most fiercely fought over the contribution to total revenues is usually less than many imagine.

While the business telecommunication market is growing, particularly for data communication, large users are also demanding, and in liberal markets have strong bargaining positions putting downward pressure on prices. In the face of mounting competition Telia's Megacom division saw operating revenues increase 8.8 per cent but the unit's gross margin fell from 7 per cent to 6 per cent. Therefore even though the structure of TeleDanmark's revenues may not differ greatly from other PTOs, and will consequently not stop others from encroaching on this market, it is true that all market players are having to work harder.

Like other PTOs TeleDanmark envisages tariff rebalancing will also make it harder for new entrants to gain market share. TeleDanmark provides customers with some of the lowest international tariffs in the OECD area, and these are being further reduced during the rebalancing process, but this is relative to high and above cost charges in all countries. At the same time Denmark has relatively expensive local call charges compared to Sweden and Finland for users that stay on line for long periods of time (e.g. Internet access).<sup>65</sup> Adding high local call charges to the fact that Sweden is the number one destination for Denmark's international traffic should mean that Telia has a great deal of incentive to enter local markets.

### *Finland*

Prior to liberalisation the member companies of Finnet provided 73 per cent of customer access lines in an area covering around 25 per cent of Finland's land mass. In contrast Telecom Finland, the incumbent monopolist for long distance and international services provided 27 per cent of access lines over the rest of the country. By the year 2000 Telecom Finland aims to have around 50 per cent of the local telecommunication market which they say accounts for 80 per cent of expenditure by consumers.<sup>66</sup> Apart from its existing base of customer access lines, Telecom Finland has established local services in eight cities (including Helsinki) formerly served only by Finnet at the local level.<sup>67</sup>

Telecom Finland is an investor in Ionica and is using FRA to install customer access networks where this provides the best solution. In March 1996 Telecom Finland commenced commercial deployment of Nortel's 'Proximity I' technology, the FRA technology licensed by Ionica, to provide customers with local access services.<sup>68</sup> Due to its established network facilities in rural and remote areas, Telecom Finland can target network expansion in the Southern and Western parts of Finland, those areas of greatest population density. This means most telecommunication users should have a choice of local access provider well ahead of virtually all OECD countries.

### *Japan*

NTT has the most entrenched bottleneck position of any PTO in a liberal telecommunication market. The provision of alternative local telecommunication networks has been allowed in Japan for a number of years. However while customers of regional local telephone companies, such as TT-Net in Tokyo, could make calls to NTT customers in their local area they could not receive calls from NTT customers on these lines. This interconnection framework is currently being reviewed. In Japan a number of CCOs are planning to provide telephone service in competition with NTT and some are commencing trials.

In general local companies in Japan have offered less expensive local calls. Connection fees were the same for individual lines as NTT but if business customers elected to take multiple lines they could receive substantial discounts. This pricing was aimed at business customers that might otherwise have to pay the full NTT connection fee. In Japan increasing local competition may be initially problematic because of the inherited pricing structure. This situation is mainly due to very high charges



for a connection to the PSTN. A telephone connection from NTT in Japan costs around US\$ 720 compared to an average of about US\$ 30 for Canada, US\$ 35 for New Zealand, US\$ 44 for the US and US\$ 47 for France -- although as explained below what is being purchased is not the same as in these other countries.

Historically the reason for the high connection charges, and up until 1983 the telephone bond, was to raise capital. The major benefit of the system was seen to be that it prioritised demand to those able to pay the higher charge and enabled this money to be reinvested in network expansion. Capital became available for network development as the expense arose rather than being recouped over time through higher rental or call charges. In Japan, unlike other OECD countries where a subscriber buys installation of a connection to a specific location, the customer buys the 'right of connection'. In other words subscribers who discontinued service can preserve their right of connection and not have to pay if they subsequently want to rejoin the network. This is made possible by NTT issuing a certificate granting the holder the right of connection. Thus, for example, an NTT subscriber working abroad for a number of years can preserve the right of connection. The certificate can also be sold to a new subscriber (or a third party that resells the certificate to a new subscriber) and NTT will honour the right of connection. The corollary is that companies and individuals can treat the right of connection as a financial asset. In other words individuals and businesses can regard telephone connections much like any other asset which can be bought, sold or used as collateral.

Today the system raises a number of problems for Japan in terms of expanding access to information infrastructure. First is that the demand for second residential lines is likely to be much slower in Japan. In fact the system may be costing NTT a significant amount of lost revenue to the extent that it suppresses demand for second lines or forces some customers, such as students, to take cellular mobile subscriptions as a less expensive low user option over the short term. A second issue, and potential problem, arises with local telecommunication competition.

One way to start thinking about what would happen to the existing system in Japan is to examine the experience with connection fees in other OECD countries with liberal local markets. For a new entrant, in a country with a moderate to high telephone penetration rate, the major market for service is the existing customers of the incumbent. In the UK between 80 and 90 per cent of the customers won by CCOs, depending on the region, are from BT. Accordingly the new market entrant has to price connection in a way that minimises the transaction cost for a customer changing service provider. If the price for a new connection is relatively high, as is the case in the UK (US\$154 excluding VAT), new entrants do not discount within the usual bounds of telecommunication competition, but by amounts in the order of 70 per cent.

In the UK, to build the momentum of subscriber growth, some CCOs have in the past been willing to offer free connections to customers to change from BT to their service. The corollary of a new market entrant minimising the customer's transaction cost, is that the incumbent is forced to respond in kind if they want to win customers back. In practice this means incumbents, where they have not previously done so, introduce different connection rates for premises where a line exists than when it needs to be installed. A by product of the pricing stimulated by new operators is that it tends to grow the market by attracting new customers for which the high connection fee was formerly a barrier. While small compared to the market for existing subscribers this is still a significant market and an important segment in terms of universal service.

For Japan the main issue here is whether the existing system creates obstacles to increasing local competition. In other words can a new market entrant offering a full range of services price connection services in a way that will minimise the transaction cost for an existing NTT customer to change service

supplier. Clearly any new entrant could not provide an identical 'right of connection' service to a customer in the same manner as NTT because they would not have a national network. In other words if a customer shifted from one location to another, outside the reach of the new entrant's network, they could not be guaranteed a connection by the new entrant. So if the current system of selling 'connection rights' instead of connections was enshrined as a regulatory requirement it could favour the incumbent, unless additional regulatory requirements somehow levelled the playing field.<sup>69</sup> Such regulation, which might have to involve price regulation for the connection charges of all operators, could also undermine many of the benefits competition can bring to the provision of access networks.

If greater freedom was given to market forces how connection services would be priced by new operators, and what NTT's response might be, would provide fertile ground for game theorists but this goes well beyond the scope of this paper. What can be said is that if competitors, offering a full range of services equivalent to NTT, chose a price level close to NTT (or the resale rate), so that the certificates would retain their resale value, it might allow customers to change suppliers without a large transaction cost. Customers could do this by selling their NTT certificate and using the money to buy a connection from the new operator. The problem with this scenario is that a new operator is in effect selling a different product -- that is, a connection of a specific line rather than connection right. Accordingly customers might balk at making a change, which would still carry a significant transaction cost, for a product with less perceived value. Moreover it would make marketing local service harder because to attract an NTT customer a new operator would have to motivate prospective customers to sell their existing 'connection right'. At the same time NTT would face an almost impossible situation to win customers back because they would have sold their 'connection right' and have to pay the full cost (or the price of a certificate from a reseller) to rejoin the NTT's network.

On the other hand a new market entrant, offering a full range of services, might elect to minimise the transaction cost by, hypothetically, charging US\$ 30 for a new connection. Clearly despite the fact that they are selling a different product it is substitutable, meaning that the resale market for NTT certificates would collapse. The impact would be that existing NTT business and residential subscribers would have to write off billions of dollars. This could be very unpopular with existing customers that have come to regard the 'connection right' as a financial asset. This antipathy could be accentuated if existing customers had to pay higher rental charges or call charges although in practice this should not be necessary because lower fees should stimulate demand and generate greater revenues. There would be a number of other benefits. New customers would be able to join the PSTN, and existing customers would be able to buy additional lines, at much lower prices. It could facilitate greater opening of the local market and thereby bring new and improved services to Japanese subscribers. NTT is reported to be currently reviewing its connection fee.<sup>70</sup>

### *Mexico*

Starting in August 1996 new market entrants were allowed to build and operate PSTN infrastructure for all services in competition with Telmex. However it will not be until January 1997 that these companies will be able to interconnect their networks to the facilities of Telmex. The importance of interconnection and equal access is no better exemplified than in the case of Mexico. Technically it has been possible for several years to apply for a licence to provide local service in competition with Telmex. Prior to 1996 this had never happened because of the lack of an interconnection framework and Telmex's monopoly over national and international PSTN services. This is unfortunate because the greatest need in Mexico, with only 10 mainlines per 100 inhabitants, is to expand basic telephone access.

More positively new market entrants recognise that with a new interconnection arrangement coming into effect they have an enormous market opportunity. Several companies have applied for licences to provide local services and importantly they will be able to provide a full range of telecommunication services via their own infrastructure. Alfa, the Mexican industrial conglomerate, together with AT&T plan to provide long distance and local service via a joint venture called Alestra.<sup>71</sup> The new venture plans to use fixed wireless technology to provide local telecommunication service and the company is rolling out a national fibre optic network across Mexico. One of Mexico's leading cellular mobile companies, Iusacell has also indicated it would like to enter the local telecommunication market. Ameritel, a joint venture between Radio Centro and US Global Telecom has requested a licence to provide wireless local and long distance service. Another large Mexican company, Pulsar, is an investor in Ionica and has in the past expressed interest in the local telecommunication market in Mexico. Use of fixed wireless technology is favoured in Mexico because Telmex closed off the option of using much of the existing cable television infrastructure when it purchased the largest operator in 1995.

### *New Zealand*

Clear Communications, TCNZ's leading rival in New Zealand, focused on the national and international markets after service commenced in 1991 with very limited local service. For a number of years protracted negotiations took place between these two operators, including resort to the courts, over interconnection for local service. In September 1995 agreement was reached between TCNZ and Clear and this became operational on 1 January 1996. The agreement includes prices for local access interconnection whereby Clear will contribute to the fixed and common costs of TCNZ's network and the two companies will pay each other for local calls exchanged between their networks. A separate agreement also provided for Clear customers to be listed in TCNZ's directories.

With an interconnection arrangement for local service in place Clear has indicated it will increase local telecommunication services to business customers in New Zealand's major cities and might in time extend service to residential customers. In New Zealand local calls for residential users are unmeasured with the corollary being that line rentals are expensive relative to other OECD countries. Business users pay measured rates for local calls. As a result TCNZ's revenue structure is somewhat different than most other PTOs. The company's revenue received from fixed charges (mainly line rentals), has traditionally been the highest in the OECD area as a proportion of total revenue.<sup>72</sup> On the other hand the contribution of call revenues, as a proportion of total revenue, has been among the lowest in OECD countries. This raises the question of what impact unmeasured local rates for residential users has on the attractiveness of providing competitive local access networks.

In considering the development of local telecommunication competition it has been noted that local service is the largest of all telecommunication markets, that it is growing in size and strategic importance, and as convergence further develops it is just one possible revenue stream which will attract new market entrants. However it is also true that the impact of the pricing structure for local calls needs to be considered because this can clearly impact on the distribution of revenues between different telecommunication segments. This, in turn, plays an important part in the business strategy decisions of new market entrants.

In the OECD area the pricing of local calls varies between measured rates (i.e. timed local calls found in most countries), unmeasured rates (i.e. no charge per local call such as in many parts of Canada and the US) and flat rate (i.e. same price irrespective of duration such as Australia). To date, full infrastructure competition for residential users has only occurred where there are measured local calls (i.e. Finland, UK) or flat rate local calls (Australia). In the Canada and the US, most of the announced plans for

residential infrastructure competition to date involve CCOs. One reason for this is because of the potential of additional revenue streams (Internet, long distance telephony) that complement cable television revenue, even in the absence of local call charges.

Due to the fact that TCNZ has unmeasured residential local calls it is difficult to say what impact this has on the plans of potential new entrants, such as Clear Communications, in the residential local telecommunication market. Demand for local telecommunication services is growing as measured by access lines and the volume of local calls. In the five years to March 1996, the volume of local calls increased 44 per cent and access lines by 15 per cent. However because residential calls are unmeasured, and access line rental charges only increase in line with the cost of living index, growth in revenue terms is constrained relative to many other OECD countries. Of course, in practice many other OECD countries would not be receiving the growth rates as high as New Zealand, because of high measured charges for local calls, and if the US experience is an indication TCNZ should increase second residential line sales as demand for Internet access increases. Nevertheless looked at from the perspective of a competitor, a new market entrant would obviously not be able to discount local calls as occurred in Australia and the UK and would have to rely on more efficient infrastructure provision to discount line rental.

Accordingly any new market entrant for the residential services in New Zealand is going to have to look to new sources of revenue to justify infrastructure development. One window may be closing in respect to cable television. Like many other PTOs, TCNZ has started to roll out a broadband cable network (hybrid fibre/coaxial cable) ahead of local access competition. Cabling commenced in January 1996 in Auckland and Wellington and TCNZ aims to have passed 70 000 households by the end of 1997 and further stages are planned. This would only represent 6 per cent of all households in New Zealand but the programme could, based on the Australian experience, undoubtedly be accelerated with the entry of another company with a cable based strategy for the local communication access market. The presence of the TCNZ's network in the country's two most important markets will make it much harder for a new entrant in this market. However a company called Saturn Communications is installing a broadband HFC network in the Wellington area and aims to pass some 50 000 households by mid 1997. It plans to offer both video and telephony services.

### *Sweden*

The local telecommunication market in Sweden may prove to be one of the most difficult for new market entrants. Sweden has the highest telephone penetration in the OECD area, for both fixed and cellular mobile services, and has generally been among the leaders for most indicators of quality of service. For countries with measured local rates Telia's charges have traditionally been amongst the lowest in the OECD. That being said similar factors are common to Finland and this has not precluded local competition developing in that country, and benchmarking quality or price performance against monopoly PTOs in other OECD countries is little guide to the greater efficiencies competitors might achieve. Added to that Telia's rebalancing added around 10 per cent to the price of local calls in 1995 and an additional 33 per cent in January 1996.<sup>73</sup> At the same time long distance charges were brought down 24 per cent early in 1995 and cut a further 20 per cent in December 1995. Telia says its tariff rebalancing process is essentially completed although it expects further reductions to be made to its international tariffs.

On top of the reductions to standard rates various discounts are available to corporations and consumers and Telia reports slightly more than half its traffic was linked to one or another calling plan. In a competitive market one of the main aims of such plans is to build customer loyalty. Tariff rebalancing, and lower prices for leased lines to the corporate market due to competition, are adding to the trend of PTOs having to work harder to grow corporate revenues. This is reflected in staff numbers devoted to

servicing large accounts in the face of increased competition. At a time when most PTOs are reducing staff numbers those sections dealing with corporate accounts are being enlarged to provide better service. At Telia, the number of employees in Megacom, increased from 599 to 820 employees -- an increase of 37 per cent.

Telia's tariff restructuring to date has mainly focused on those markets first targeted by competitors -- national and international. However some of the company's new initiatives in local telecommunication service are also very interesting. For example, people between the ages of 16 and 25 are offered subscriptions with a lower connection fee and Telia plans to offer residential customers infrequent user subscriptions. It is interesting to note that innovations such as these, that have clear benefits for universal service, are being developed by Telia to meet expected competition in the provision of local service. Giving young people a discount on connections targets an important source of new customer lines in a market with a very high telephone penetration rate. Faced with competition this makes good sense for Telia and may enable some young people, seeking employment or pursuing higher education, to have a telephone line which they might not otherwise have been able to afford. This is another example of how OECD Member countries with monopolies are missing the benefits of competition for improving universal service.

More strategically Telia's 60 per cent of the cable television market, as measured by subscribers, will mean that competition from CCOs will take time to evolve. Kablevision, a subsidiary of the Kinnevik group, has announced new investment in a network in Stockholm capable of offering interactive services, Internet access and standard telephony with service commencing in 1996.<sup>74</sup> Kinnevik is part owner of Tele-2 the largest long distance carrier after Telia. While Telia's Annual Report says the company still has virtually 100 per cent of the local market that:

"The players who wish to compete in new markets need admission to a transport network and access to customers .... It became increasingly common in 1995 for customers [of new market entrants] to hook up directly with the help of radio stations, cable TV, or local fibre-optic networks. A growing number of municipalities are investing in their own networks for data and telecommunications. About half the municipalities in Sweden had more or less ambitious plans in 1995 to build their own networks".<sup>75</sup>

## *US*

At the time of writing the FCC was finalising detailed guidelines on local telecommunication competition as part of the process in implementing the Telecommunication Act, 1996. There are two main features of the new environment. One is to allow providers of local and long distance telecommunication to enter each other's markets, subject to various regulatory safeguards being met to open up the use of bottleneck facilities (Box 4). The second feature is that new market entrants, such as CCOs and electric utilities, will be able to provide telecommunication service. In the US it is envisaged that new market entrants will provide local telecommunication service through their own facilities or resale of existing incumbent PTO networks and unbundled facilities.

On 1 August 1996 the FCC adopted rules to implement local competition.<sup>76</sup> The main aim of adoption of the new rules is to provide a framework for arbitration in the event that new market entrants and incumbent local service providers can not reach voluntary agreements. Essentially the new rules prescribe a minimum number of points for interconnection that the FCC believes is necessary to permit competing carriers to choose the most efficient points at which to interconnect with the incumbent's local network. These rules impose on local exchange carriers obligations to provide resale, access to rights of way, and to establish reciprocal compensation arrangements for transport and termination of traffic. In

addition the FCC has set forth a methodology for establishing the rates for interconnection and for different parts of the network which are unbundled. For these elements, of which there are seven, the FCC ruled that interconnection rates should be based on Total Element Long-Run Incremental Cost plus a reasonable share of forward-looking joint and common costs.

Prior to the FCC adopting rules for local telecommunication competition the major impact of the new Telecommunication Act of 1996 has been on service suppliers positioning themselves to take advantage of new opportunities and to defend their existing markets. This has included the announcement of mergers, the continuation of cross industry investment from PTOs into CCOs outside their traditional areas of service and the creation of various alliances.

The two major planned mergers, announced to date, are between the local telecommunication service providers on the East Coast, Bell Atlantic and Nynex, and the other between Pacific Telesis and SBC Communications on the West Coast. Critics have suggested these actions are anti-competitive because they are mergers of logical competitors in terms of geography.<sup>77</sup> In the context of earlier discussions on the strategic importance of owning customer access networks it is noteworthy that these companies regard each other as the most attractive merger partners. Recognising the potential for competition between PSTN and cable networks the new Act does not permit PTOs and CCOs to acquire more than 10 per cent of each other, except in rural and other specified areas.

A growing number of CCOs, such as TCI and Adelphia Cable Communications, have also filed to provide local telecommunication service.<sup>78</sup> These companies expect to be offering local telecommunication services by the end of 1996. Contrary to the reaction to the planned RBOC mergers, investment by local telecommunication service companies, in cable systems in areas outside their traditional service areas have been viewed as promoting competition. US West Media Group's owned or managed properties, have 16.2 million customers and pass 26.2 million homes (Table 14). These figures include the company's investment in Time Warner, Telewest in the UK, and a planned merger with Continental Cablevision.

US West appears to be very enthusiastic about the use of cable networks to compete in the markets of their fellow RBOCs and in foreign markets against PTOs with bottleneck power derived from control of local access networks in countries such as the Netherlands, Japan and the UK.<sup>79</sup> In Atlanta, the Group's 'MediaOne' subsidiary has over 500 thousand subscribers in Bell South's traditional service area. US West has announced that it will begin providing switched telephone service across its cable network late in 1996 and that all homes passed will have access to cable-telephony by the end of 1998. According to US West,

"No technology matches cable for its ability to meet the needs of the emerging networked world. Only cable can deliver an expansive array of services at high speed on a fully interactive basis. In addition, cable is the only existing platform that allows true integration of voice, video and data services. Equipping a cable network to provide such features is possible on an incremental and economical basis capable of producing high returns. Domestically, upgrades costing about US\$ 200 per home passed enhance network quality and reliability. These upgrades also provide capacity for added channels, pay-per-view offerings, targeted advertising, high-speed and personal computer connectivity. Further upgrades to provide telephony and multimedia services are possible on a largely variable cost basis. The ability to upgrade the network in response to specific subscriber needs reduces the financial risk of providing enhanced services while generating significant returns. Telephony, for example, can produce returns approaching 25 per cent with less than 20 per cent market share".<sup>80</sup>

The major long distance companies have also filed at state level to provide local telecommunication service. Part of their strategy involves building local access infrastructure to business customers. MCI's local infrastructure development to date has focused on its MCImetro initiative which by mid-1996 was operational in 31 US cities with switching and metropolitan area fibre optic networks.<sup>81</sup> In terms of providing local telecommunication service the long distance carriers have also been negotiating interconnection agreements to carriers with existing local infrastructure. While a large number of such agreements have been announced the process should gain momentum now the FCC guidelines have been put into practice. A similar process seems to have worked well in the area served by Rochester Telephone with benefits for the incumbent PTO, new market entrants and customers (Box 5).

Where agreements have already been reached consumers are starting to see the benefits of competition -- initially in the 'short distance' telecommunication market. For example in May 1996 AT&T offered residential users in Illinois three months of free local toll calling if they selected A&T as their local toll carrier.<sup>82</sup> In Illinois as a general rule, local toll calls are those from a customer's home to numbers that are more than 20 kilometres yet still within their local calling area. After three months AT&T is offering these customers the chance to bundle local and long distance toll calls. The US Department of Justice has projected that local telecommunication competition could save consumers nearly US\$ 12 billion.<sup>83</sup>

**Table 14. US West and Cable Telephony**

Major Operations	Homes Passed (000)	Cable Television Subscribers (000)
MediaOne	848	527
Continental(1)	7200	4200
Time Warner Entertainment	14500	9500
TeleWest plc (UK) (2)	2100	457
KTA (Netherlands)	519	487

1. Pending acquisition.
2. Telewest had 527 000 cable telephony subscribers.

Source: US West.

**Table 15. Rochester Telephone Monthly Rate Comparisons**

US\$	December 1994	January 1995	January 1997	January 1999	January 2001
Residential basic rental	12.96	12.96	12.96	12.96	12.96
Residential touch-tone	1.48	0	0	0	0
Business basic rental	11.72	11.72	11.72	11.72	11.72
Business Touch-tone	3.87	0	0	0	0
Peak rate for business (Local measured service)					
First Minute	0.076	0.063	0.063	0.047	0.038
Second Minute	0.075	0.070	0.070	0.062	0.048
Third Minute	0.075	0.075	0.075	0.070	0.066
Access Charges					
Local switching	0.01629	0.01105	0.01105	0.01102	0.01060
Local transport	0.01290	0.01105	0.01105	0.01102	0.01060

Source: Frontier Corporation.

#### Box 4: US Competitive Checklist

The US Telecommunication Act 1996 allows local telecommunication access providers to enter new markets subject to a number of measures having been implemented to facilitate local telecommunication competition. Sprint Corporation has provided one summary of the 14 point competitive checklist and references to the applicable parts of the Act<sup>84</sup>:

1. Interconnection in accordance with the requirements of sections 251(c)(2) and 252(d)(1).
2. Non-discriminatory access to network elements in accordance with the requirements of sections 251(c)(3) and 252(d)(1).
3. Non-discriminatory access to the poles, ducts, conduits, and rights-of-way owned or controlled by the Bell operating company at just and reasonable rates in accordance with the requirements of section 224.
4. Local loop transmission from the central office to the customer's premises, unbundled from local switching or other services.
5. Local transport from the trunk side of a wireline local exchange carrier switch unbundled from switching or other services.
6. Local switching unbundled from transport, local loop transmission, or other services.
7. Non-discriminatory access to: (I) 911 and E911 services; (II) directory assistance services to allow the other carrier's customers to obtain telephone numbers; and (III) operator call completion services.
8. White pages directory listings for customers of the other carrier's telephone exchange service.
9. Until the date by which telecommunications numbering administration guidelines, plan, or rules are established, non-discriminatory access to telephone numbers for assignment to the other carrier's telephone exchange service customers. After that date, compliance with such guidelines, plan, or rules.
10. Non-discriminatory access to databases and associated signalling necessary for call routing and completion.
11. Until the date by which the Commission issues regulations pursuant to section 251 to require number portability, interim telecommunications number portability through remote call forwarding, direct inward dialling trunks, or other comparable arrangements, with as little impairment of functioning, quality, reliability, and convenience as possible. After that date, full compliance with such regulations.
12. Non-discriminatory access to such services or information as are necessary to allow the requesting carrier to implement local dialling parity in accordance with the requirements of section 251(b)(3).
13. Reciprocal compensation arrangements in accordance with the requirements of section 252(d)(2).
14. Telecommunications services are available for resale in accordance with the requirements of sections 251(c)(4) and 252(d)(3).



### **Box 5: Rochester Telephone and Benefits for the Incumbent**

In January 1995 the area served by Rochester Telephone became the first market in the US opened to full local competition.<sup>85</sup> In return for opening its market to local competition Rochester Telephone was allowed by the New York Public Services Commission, the local telecommunication regulator, to form a parent holding company called Frontier Communications. The parent company has the freedom to issue securities, make acquisitions and enter new lines of business. Rochester operates slightly more than half a million telecommunication mainlines. Through acquisitions and mergers Frontier is now the fifth largest long distance company in the US and has group revenues of US\$2.1 billion. A price regulated network company was formed called Rochester Telephone Corp which provided its own retail, wholesale and access tariffs. Certain competitive services, such as cellular communications, were transferred to Frontier. After the first quarter of 1995 eight companies had announced their intention to provide local services, some using the Rochester Telephone network as their platform, including AT&T, MFS and Time Warner. As part of the agreement to open local markets Rochester Telephone committed to hold some basic rates at the same level until 2001 and bring others down over time, including the wholesale access rates (Table 15). A year after opening its local market Frontier reported record profitability:

“The company’s local telephone operations continued to be a strong contributor to cash flow and profitability in the first quarter of 1996. Led by 8.6 per cent growth in minutes of use, 3.9 per cent growth in access lines and strong sales of enhanced features and Internet access, overall revenues grew 3.8 per cent: US\$ 158.4 million. Significantly revenues in the competitive Rochester, NY market improved 5.4 per cent”.<sup>86</sup>

The following points set out the benefits for itself, its customers and its competitors, as seen by Frontier from the perspective of an incumbent PTO, of liberalisation:

#### **Company benefits**

1. Increases Frontier's flexibility to make acquisitions and investments, and enter into new lines of business or geographic areas.
2. Enhance Frontier's ability to compete on a level playing field.
3. Provides unprecedented regulatory relief with price-cap regulation of Rochester Telephone.
4. Increases usage of Rochester Telephone's network.
5. Allows Frontier Communications of Rochester to package and market integrated telecommunications services, including local telephone, long distance, wireless, equipment, and information services.
6. Provides a degree of certainty with respect to Rochester Telephone's rates due to the rate stabilisation plan.
7. Positions Frontier to more effectively pursue current businesses and long-term strategic direction.
8. Promotes competition and the quest for excellence, reinforcing Frontier's commitment to innovative, integrated telecommunications solutions for customers, no matter where they live, work or travel.
9. Enables Frontier to lead, not follow.

#### **Customer benefits**

1. Lower prices.
2. Greater range of choices.
3. Improved customer service.
4. Increased potential for the introduction of new technologies and innovative products and services.
5. Transparent calling among customers of competing companies.
6. Full telephone number portability, allowing customers to retain their current phone number, regardless of which local phone company they choose.

#### **Competitor benefits**

1. Complete access to Rochester Telephone's existing, fully digital network.
2. Full interconnection of competing local networks.
3. Reciprocal compensation for network usage.
4. Equal access to network databases.
5. Equal access to local telephone numbers.
6. Convenient telephone number portability.

## REGULATION AND LOCAL TELECOMMUNICATION COMPETITION ISSUES

Over the first decade of telecommunication infrastructure competition a number of regulatory principles have emerged and become widely accepted. These principles range from principles encouraging cost oriented and transparent pricing to ensuring fair and equal access arrangements for interconnection. Some principles have become so common, such as the separation of regulation and operation of telecommunication networks, that it is easy to forget that it was not ever thus. Nevertheless as competition developed different aspects of these principles have been modified. One example was the growing recognition of the importance of not leaving responsibility for the national numbering plan solely under the control of the incumbent PTO.<sup>87</sup> On the other hand some regulatory requirements, such as competitive safeguards, have been able to be lifted in some countries as effective competition developed in certain market segments. As local telecommunication competition has developed the worth of the existing principles has generally been reinforced but it is also true that some new issues, or at least nuances of old issues, have emerged. The following section briefly raises some of these issues for discussion. More detailed treatment of these issues as they relate generally to telecommunication competition are available in ICCP papers referred to in the text.

### Issues for Discussion on Local Competition

#### *Number portability*

New Issue: Number portability seen as essential for local telecommunication competition.

One of the main issues that sets local telecommunication competition apart from long distance competition is the need for telecommunication number portability.<sup>88</sup> Number portability is the term used to describe customers being able to keep the same number when they change their local access provider. In long distance markets, where competing carriers accessed residential customers via the same telecommunication line, there was little need for number portability. In some OECD countries, residential customers access the long distance carrier(s) of their choice via pre-selection or dialling a certain prefix. If customers do not make a choice they are allocated a carrier by default through various means.

In the long distance market for business customers the need for number portability gradually emerged in several areas. One example of the need for portability arose with numbers for toll free services (i.e. 800 numbers). The main reasons business customers wanted to take their number with them when they changed long distance carrier was because they had invested resources over time in making a number known to their customers or because the number itself, in combination with letters of the alphabet, had brand recognition for customers. Similarly in those cases where new market entrants built direct connections to business premises, business users also wanted to retain numbers because of the resources invested in the past in making these numbers known to their customers. The corollary in both the cases of 800 numbers or ordinary business numbers being that this resource investment would have to be incurred again with a change of supplier and a new number.

In the case of direct connections, provided by a new market entrant for business customers, the financial savings or improved service business users received often justified the change irrespective of the availability of number portability. In some cases, the solution business users adopted was to keep an existing line(s) to the incumbent PTO to take incoming calls while shifting the bulk of their business to a new market entrant. As local competition develops for residential and small business customers this is far from an ideal solution. It is generally believed that residential customers would prefer to keep their existing number if they change service supplier because of the convenience of not having to inform others of their new number.

In the UK new entrants to the local telecommunication market have pushed for number portability for some time and the service is gradually being rolled out across the country. In May 1996 Nynex CableComms introduced number portability in the UK.<sup>89</sup> Some of the main issues that arise in introducing number portability are who pays for the service and how much is charged. In the UK a one-off charge is paid by the customer of which part goes to the incumbent operator. Over the long term number portability can also work in favour of incumbents as they attempt to win customers back from new market entrants. In the EU area number portability is a requirement of the interconnect directives<sup>90</sup>.

In the US it is planned for the cost of introducing number portability to be shared between the operators.<sup>91</sup> As part of its detailed rules for the implementation of the Telecommunication Act of 1996 the FCC requires local telecommunication carriers to begin deploying number portability technology by October 1997 in the largest 100 metropolitan areas and deployment is to be completed by the end of 1998. In the transition period the FCC has ruled carriers with local access networks must offer number portability through existing technology such as remote call forwarding. From 1999, local carriers must offer number portability within six months to any requesting carrier outside the largest 100 metropolitan areas.

In the UK Ionica has developed an interesting pricing innovation during the transition period to the introduction of full number portability in its service area. If a customer elects to take service from Ionica the company will give them a free line rental until one month after the transfer of their existing number from BT to Ionica.<sup>92</sup> In other words the customer can keep the BT line for incoming calls until number portability is available without paying for Ionica's line.

### ***Customer information***

New issue: Prior to local telecommunication competition some customer information had only been generated by incumbent PTOs with local access networks. This raises the question of how information generated by new market entrants will be treated.

It is well recognised that new market entrants need non-discriminatory access to telephone numbers, directory assistance, and directory listings and no unreasonable dialling delays.<sup>93</sup> As greater numbers of new market entrants build direct connections to customers they are also contributing information to the incumbent PTO's database. As PTOs generally make money from this database, either through directory services or sales of advertising in directory publications, it raises the question of whether new market entrants should receive payment for the information they generate. Moreover control over customer information databases by the incumbent PTO means that some safeguards are necessary to prevent misuse of this information. At the same time, apart from billing, the greatest contact PTOs have with customers is via directory services. Where the incumbent PTO continues to provide services, such as directory inquiries, this should be done in a company neutral manner. In the EU area, directories and

directory enquiries are considered as competitive services (Article 90 Directive). PTOs must make available directory information on fair and reasonable terms to others<sup>94</sup>. All fixed network operators must ensure that users can access directory services. (New ONP voice proposal Art. 9).

### ***Industry co-operation and open standards***

New issue: Greater co-operation is needed between competing carriers to implement local telecommunication competition than in previous market segments that have been liberalised.

Co-operation between telecommunication service providers is a key element in making local telecommunication markets function efficiently with multiple operators. Oftel, the UK Cable Communications Association and individual new market entrants strongly emphasise the importance of intra-industry co-operation. In the UK the Network Interoperability Consultative Committee (NICC) enables all PTOs to work together to agree voluntary standards for technical interfaces between networks. An example of a service enabled by such co-operation, that would not be possible without co-operation on technical standards or the use of proprietary software in switches, is that customers from different PTOs can receive Caller Line Identification. Co-operation and competition can co-exist in local telecommunication markets to the benefit of PTOs and customers. A current example is the introduction of number portability. In a press release announcing the launch of the service Nynex CableComms praised BT for the co-operation it had received while at the same time saying its prices were on average 25 per cent lower than BT's standard rates.<sup>95</sup>

### ***Rights of way and planning legislation***

New issue: The need for 'rights of way' for new market entrants, and efficient government action in areas such as planning legislation, sharply increases with the construction of local access networks.

Building new local access networks has proved controversial in some Member countries introducing local telecommunication competition. In Australia, Optus Communications faced criticism on environmental grounds when it began installing overhead cabling on poles belonging to other utilities for its broadband network. Telecommunication cabling by Telstra had for many years been mainly underground in Australia's urban and rural areas. On the other hand in the UK, CCOs met similar opposition when they were required to lay all their cable underground. Similar issues have arisen in the construction of fixed wireless and mobile wireless services. Consideration of environmental and planning issues goes beyond the scope of this paper, other than to note that some sharing of infrastructure, such as ducts, poles and radio towers is occurring on a co-operative and commercial basis in some countries. Some regulators have been involved in facilitating this process. At the same time reform is sometimes needed to ensure all operators have access to public right of way on economical and non-discriminatory terms. One example of where reform would be needed is if telecommunication legislation and municipal ordinances required contradictory actions in building local access networks.<sup>96</sup> In the EU area Article 90 of the "Full Competition" Directive requires Member States to give rights of way to public network operators after January 1998.

### ***Radio frequency allocation***

New issue: Market convergence between fixed and wireless services which could mean charging for the use of spectrum (e.g. auctions, ongoing fees) tilts the playing field toward the incumbent PTO.

A growing number of governments are increasingly charging service providers for their use of the radio spectrum.<sup>97</sup> These charges are often much higher than what is needed for cost recovery of government management expenses and reflect a judgement by the market of spectrum worth. In the US spectrum auctions have raised more than US\$ 9 billion since 1993.<sup>98</sup> The issues surrounding the economics of radio frequency allocation have been subject to much debate, however this discussion has largely not touched on the impact one or another method of frequency allocation may have on convergence. Traditionally charges for spectrum use via auctions or ongoing fees have been between firms wanting to compete using the same technology in the same market segment. In that sense spectrum fees were technologically neutral. Currently the mobile market is different to the fixed network market and in the majority of cases operators are not considered to be competing against each other.

One new issue that may emerge with local telecommunication competition is what happens if operators of fixed wireless services have to pay spectrum charges if fixed wireline operators do not pay charges. For example if an OECD country licensed a fixed wireless operator and charged fees for the use of the radio spectrum would this place that carrier at a disadvantage relative to the incumbent PTO. Moreover, as the convergence of mobile and fixed communication markets develops, will auctions or fees for mobile communication use of the spectrum also place these operators at a disadvantage relative to the fixed network operators? On the other hand it might be argued that the cost of spectrum is not really at issue because it must have an opportunity cost of alternative uses. It might also be argued that spectrum pricing is a useful way of ensuring that spectrum is efficiently used.

### ***Interconnection and equal access***

New issue: Should new market entrants in the local telecommunication market be required to provide all aspects of equal access on the same basis as incumbents?

A new aspect of the telecommunication infrastructure competition is whether new market entrants should be required to provide equal access to all competitors. While a growing consensus has developed that for competition to work efficiently incumbent PTOs must provide equal access to rivals there is less agreement on this issue in respect to new market entrants building their own infrastructure. For example, incumbent PTOs in competitive markets are required to provide access to customers of rivals for long distance services. The question is whether CCOs, or an FRA operator, should face the same obligation for the local access networks they construct. In other words should a subscriber that takes local service from a CCO be able to take long distance service from a long distance operator. A similar situation could arise with the provision of Internet access. Should CCO's be able to bundle high speed Internet access with carriage in one package for their customers and not be required to make carriage elements available to IAP customers?

Proponents of not placing such a requirement on new operators argue that companies rolling out local networks need to be given the incentive of knowing that they will have the sole right to use their facilities in all segments of the telecommunication market -- or at least the sole right for a certain amount of time. One option is to oblige companies to provide equal access, on the same basis as incumbents, when they reach a certain market share. In New Zealand the Clear-Telecom interconnect agreement provides for the incumbent (TCNZ) to provide long distance service to Clear's local customers. The EU Interconnection Directive says that all operators who control access to customers via control or ownership of the local loop have to negotiate interconnection (Article 4(1) and Annex II). There is no requirement for such an operator to negotiate with a pure long distance operator with no directly connected customers.

### *Market structure*

New issue: Some governments believe limitations need to be placed on incumbent PTOs entering new markets, such as broadcasting, to give new entrants incentives to establish local access networks. Will other regulatory limitations develop with new technological platforms to nurture competitive entry?

To date telecommunication competition has generally been between firms using the same types of networks to provide services such as long distance telecommunication service. In local telecommunication markets increasing competition is expected to develop from different technological platforms. Some new market entrants say it is not an easy task to raise capital in the face of an incumbent PTO with bottleneck control of existing infrastructure. In the UK one way the Government has fostered local telecommunication competition is by restricting BT's ability to offer broadcasting services over its national PSTN. In other words the government has denied national cable broadcasting as a potential source of revenue for BT while enabling CCOs to take advantage of the addition of telephony revenues. BT is permitted to apply for cable licences on a franchise by franchise basis on the same conditions as CCOs and operates the Westminster cable franchise. The UK government may review existing restrictions on PTOs offering broadcasting services over the PSTN in 1997 and 2001. In both reviews the basis for decision will be whether new market entrants have had sufficient time to establish themselves and to withstand direct competition from PTOs.<sup>99</sup>

In those cases where a market entrant using a third technological platform, such as FRA, enters the market will other regulatory restrictions emerge in one market segment to foster competition in the overall telecommunication market. In the case of FRA, one example might be limiting the number of licences for a certain part of the radio spectrum, with a view to encouraging local access telecommunication competition between the traditional PSTN Telephony, Cable Telephony and FRA Telephony. On the other hand limiting mobile cellular communication markets to monopolies and duopolies, in the absence of other local access competitors, will slow local telecommunication competition because it will slow convergence between fixed and mobile markets.<sup>100</sup> EU policy is that market entry should only be restricted on the grounds of scarce resources (e.g. radio spectrum).

## NOTES

<sup>1</sup> In Mexico full competition will not begin until 1 January 1997 when Telmex is required to interconnect its network with competitors. Prior to this new entrants can offer public switched services over their own infrastructure without interconnection.

<sup>2</sup> The word 'public' in PTO refers to the ability of telecommunication operators to offer services to the public. It does not refer to ownership or corporate status.

<sup>3</sup> It is true that in the past some customers shared a telecommunication mainline sometimes known as a 'party line'.

<sup>4</sup> FCC, "Statistics of the Common Carriers", Washington, 1991-92 and 1994-95 editions. Central office switches excluding remote switches. Including data for Puerto Rico.

<sup>5</sup> Excluding non switched access lines.

<sup>6</sup> Telecom New Zealand, "Annual Report 1995", Wellington, 1996. p 26.

<sup>7</sup> John de Ridder, "Local Calls on the Line", *Australian Communications*, December/January 1995-96. p. 57.

<sup>8</sup> TCNZ, "Annual Report 1996", Wellington, 1996. p. 2.

<sup>9</sup> This option is not available for business customers or for calls made from payphones.

<sup>10</sup> *Ibid* p 6.

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<sup>13</sup> Oftel, "The UK Telecommunication Industry: Market Information 1992/93 to 1994/95", London, 1995.

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<sup>19</sup> "Europe Online declared bankrupt by Luxembourg court", *Reuters News Service*, 5 August 1996.

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<sup>21</sup> For a comparison of local call charging methodologies see OECD, "Information Infrastructure Convergence and Pricing: The Internet", OCDE/GD(96)73, 1996. Document is available at [http://www.oecd.org/dsti/sti\\_ict.html](http://www.oecd.org/dsti/sti_ict.html).

<sup>22</sup> Dianne George, MFS, 'Last Mile' Ownership, TMA, from TMA News and Views, February 1995.

<sup>23</sup> Edward Whitacre, Jr. Chairman of the Board and CEO of SBC Communications (formerly Southwestern Bell) in "SBC Communications Earnings Up 13.3 per cent; Record Second-Quarter Earnings and Operating Cash Flow", PR Newswire, 18 July 1996.

<sup>24</sup> Timothy K. Stevens and James E. Sylvester, "Superhighway Traffic Taxes Current LEC Networks", 29 July 1996.

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