SUPPLEMENTARY SUBMISSION BY AAPT TO THE PRODUCTIVITY COMMISSION REVIEW OF TELECOMMUNICATIONS-SPECIFIC COMPETITION REGULATION

3 November 2000

This submission is the second made by AAPT Limited ("**AAPT**") to the Productivity Commission ("**Commission**") Review of Telecommunications Specific Competition Regulation ("**Review**").

No material in this submission is confidential.

This submission is structured as follows:

1. introduction and overview
2. summary of research on the development of competition under the telecommunications-specific competition regime;
3. summary of research on the effect of the telecommunications-specific competition regime on investment;
4. AAPT comments on other submissions;
5. AAPT recommendations for changes in the regime; and
6. other matters relevant to the Inquiry – the treatment of convergence and Australia's obligations under the General Agreement on Trade in Services.

Annexed to this submission are research projects which AAPT has commissioned relating to the effect of the regime on investment and the development of competition.

1. INTRODUCTION AND OVERVIEW

AAPT supports the full retention of Parts XIB and XIC of the TPA. Both sets of provisions are required to continue the achievement of the Government's policy objectives. To the extent that there has been any valid criticism of these elements AAPT believes they relate to impediments on the Australian Competition and Consumer Commission ("**ACCC**") producing speedy outcomes.

In its initial submission dated 7 August 2000, AAPT provided specific answers to the questions in the Productivity Commission's Issues Paper and outlined some general themes which it considers should inform the Review. Those themes are:

- that Australia's telecommunications markets cannot be regarded as homogeneous with regards to the development of competition[1] – **competition is yet to broaden and deepen**;

- that Part XIB has been important **both as a means of addressing anticompetitive conduct and as a deterrent against such conduct**;

- that the access regime in Part XIC of the TPA encourages investment because **access-based competition leads to infrastructure-based competition**;

- that although there are some weaknesses in the regime (notably delay and information asymmetry), the effectiveness and **administrative costs of the regime are low as a proportion of industry revenue, less than costs under alternative regimes and more fairly distributed**;

- that reform of the regime should be directed toward competition issues likely to arise in the next 2-7 years, notably the impact of convergence and rationalisation of the industry through mergers and strategic alliances; accordingly the **competition protections should be made stronger not weaker**.

In this submission, AAPT presents economic research it has commissioned on two issues which it considers central to the Review – the extent to which the regime has encouraged competition in telecommunications and the impact of the regime on investment in telecommunications infrastructure.

AAPT also addresses a number of arguments made in other submissions, both those with which it agrees and those it does not.

The submission also makes recommendations for changes to the regime which seek to provide for "incented negotiation". AAPT notes that delay in processes and information asymmetry were issues raised by most parties submitting to the Review

[1] AAPT notes that this theme was also the effect of the first recommendation of the Report of the Telecommuncations Service Inquiry ("**Besley Report**").

and presenting material at the Commission's public hearing. AAPT's suggestions for incented negotiation seek to address the underlying causes of these problems, namely substantial market power and information asymmetry. AAPT proposes a number of mechanisms which, when taken alone or in combination, it believes would substantially improve the prospects for commercially negotiated outcomes and, where arbitration is necessary, the effectiveness of the arbitral process and its outcomes.

Finally, this submission addresses two important "context" issues. The first is the extent to which convergence results in the characteristics of telecommunications entering other markets and the need to consider the extension of competition law to cover converging industries. The second is the extent to which Australia's international treaty obligations mandate the retention of regulatory provisions specific to telecommunications.

2. OUTLINE OF COMPETITION RESEARCH REPORT

AAPT commissioned Frontier Economics to conduct research and report on the state of competition in Australian telecommunications markets and the impact of the current regulatory regime on competition. The Competition Research Report is **Annexure A** to this submission

The primary objective of their Competition Research Report is to identify existing "artificial" barriers to entry and whether the current regulatory framework is sufficient to address those barriers. The report also addresses the question of "spillover" effects and the inter-relationship between telecommunication's markets, particularly in regard to the leveraging of market power from one market to another.

As a starting point, the report notes that there are significant differences in terms of the development of competition in different telecommunications markets. These differences, the report finds, are particularly evident along the geographic, functional and product dimensions of the markets.

In order to assess the state of competition in Australian telecommunication's markets, the Competition Research Report addresses indicators of competition, including concentration, margins between prices and costs and other market outcomes.

In terms of geography, the report arrives at similar conclusions to those in the Besley Report[2] – principally that the different characteristics of regional markets are so significant that they may justify the consideration of alternative competition models which encourage "competition for the market" rather than "competition in the market".

Similarly, the report concludes that there are significant differences between retail and wholesale functional levels in these markets. The existence of competition at one level at the retail level of a particular product market may not provide a good indication of the state of competition in the relevant upstream (wholesale or network) markets.

The Competition Research Report addresses competition in six major product markets, namely:

- local access and local calls;
- national long distance and fixed-to-mobile;
- international services;
- mobile services;

[2] see chapter 7, "Market dynamics – competition, technological change and new market models", particularly, p. 137.

- Internet services; and
- data services.

The report finds that there are substantial existing artificial barriers to competition in the local services market, however, these barriers are currently effectively addressed by the current regulatory regime.

In regard to long distance and fixed-to-mobile services, the report notes that competition has developed significantly in the retail markets but that the "natural" barriers to entry and the level of competition in the wholesale market means that there will be a continuing role for the telecommunications-specific competition regime.

Similarly, the report finds that competition has developed significantly in the international services market and that the main threat to competition in this market is the possibility of spillover effects from local access markets.

The mobiles market at the retail level is found not to be characterised by significant barriers to entry and shows evidence of effective competition. However, the report notes specifically that the absence of a preselection regime for mobile calls means that mobile networks have market power in relation to mobile-to-fixed calls, which creates the potential for distortion and strategic conduct.

In regard to Internet and data services, the report finds that barriers to entry to the Internet market are not significant and there has been substantial entry and exit. The report does note that the integration between the wholesale (transmission) level and the retail market creates some opportunities for major providers of backbone services to leverage that power into the downstream markets for Internet access. In relation to data markets, the report finds that barriers to network-based entry are significant, particularly in regional markets. In many cases, high speed transmission is a natural monopoly and therefore justifies the continued application of the regulatory regime.

Overall, the report finds that the regulatory regime has been successful in introducing competition in some markets. However, the report also indicates that there will continue to be a need for regulation in the Australian telecommunication's markets in order to address barriers to entry and to continue the important role that the regime has played in promoting competition in Australian telecommunication's markets since 1997.

3. OUTLINE OF INVESTMENT RESEARCH REPORT

Access Economics was commissioned to conduct research and report on the state of investment in Australian telecommunication's markets since 1997 and the effect of the current regulatory regime. The Investment Research Report is **Annexure B** to this submission.

The report finds that available data on investment in Australian telecommunications is limited but that, on the basis of the available information, there is little to suggest that the regulatory regime has had a detrimental impact on the level or efficiency of investment. Importantly, the report finds little or no evidence that Telstra's own investment has been adversely affected by the introduction of the regime. Indeed, analysis of Telstra's published financial reports indicates the opposite.

The report includes a substantial theoretical analysis of the impact of access regimes on investment decisions, which suggests that the existence of an access regime encourages efficient investment by promoting correct build-buy decisions. Such a regime encourages access by new entrants and removes a considerable degree of uncertainty and investment risk in downstream markets.

On the basis of the above data from the Australian Bureau of Statistics and Access Economics' own investment time series, the Investment Research Report concludes that, any detrimental impact on investment created by the regulatory regime is likely to be transitional rather than structural. Where aggregate investment has declined since 1997, that effect is most likely due to changes in the regulatory arrangements, and resulting uncertainty, rather than any structural hindrance to investment.

In regard to the impact on investment of the 1997 regime, the report finds, on balance, that it is likely that the regime has contributed to Australia's investment in telecommunications infrastructure by providing mechanisms for competition and encouraging entry by new and efficient carriers. There is also evidence that the regime has induced increased investment in telecommunications facilities by private users.

The conclusion which AAPT draws from the report is that investment is more often affected by changes to regulatory regimes rather than the existence of an access regime per se. Furthermore, the existence of the regime is essential to encouraging efficient investment.

4. COMMENTS ON OTHER SUBMISSIONS

In this chapter, AAPT will identify major points and themes in other submissions which it believes require further commentary and, where necessary, rebuttal. AAPT will not attempt to respond to all submissions, or to all points with which it may disagree.

4.1 General Comments

In its submission, Telstra claims that the "current telecommunications market is extremely competitive at all levels".[3] AAPT repeats its view that it is misleading to discuss a homogeneous "telecommunications market". It agrees that the market is more competitive than it was prior to 1 July 1997, but considers that at this time the markets could not properly be described as substantially, let alone "extremely", competitive. AAPT notes the conclusions of the Besley Report and its own competition research in this regard. Telstra's own position of dominance in many telecommunications markets, particularly its control of the only ubiquitous CAN, means that many telecommunications markets remain extremely difficult for new entrants to compete in.

On the basis of its view of competition, Telstra argues that the sector-specific competition regime established by Part XIB was, and is, unnecessary. AAPT strongly opposes this view, and argues that sector-specific regulation will continue to be needed for at least the medium term. AAPT also suggests certain improvements that could be made to Part XIB.[4] AAPT notes that nearly all submissions, including Telstra's, support the retention of Part XIC, although different parties suggest various amendments. AAPT itself believes that Part XIC should be retained and improved.

In AAPT's view, Telstra's submissions on the state of competition and the need for Part XIB are a result of Telstra's inability to comprehend and acknowledge the extent of its own market power or the potential damage to competition created by that market power. Telstra's failure to recognise its own power in several markets is one of the reasons other industry participants are most keen to preserve Part XIB.

4.2 Part XIB – Competitive Safeguards

Some submitters, particularly Telstra and, to a lesser extent, Vodafone, argue for the repeal of Part XIB. In general terms, these carriers argue that the telecommunications industry does not, and probably never did, require sector-specific competition regulation. Telstra's case for the repeal of Part XIB includes the claims that it is unjustifiably intrusive, deters investment and increases the risk of regulatory error.

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[3] Telstra, *Public Submission to the Producivity Commission Review of Telecommunications Specific Competition Regulation*, 30 August 2000, ("**Telstra Submission**"), p. 5

[4] Section 5, below.

Telstra also claims that the investigations the ACCC has conducted under Part XIB could have been effectively pursued under Part IV.[5]

Need for a Sector-specific Approach

AAPT (and others) maintain that the telecommunications market, while more competitive in some respects than several years ago, still requires sector-specific regulation. It is clear that Telstra holds market power in many of the fixed telephony markets. Telstra's ownership of the ubiquitous CAN gives it a position of dominance in these markets.[6] Although Telstra's market share has fallen in some telecommunications markets (such as long distance and international telephony), this does not necessarily mean that Telstra's market power has been diminished, either in these or other markets.

First, Telstra remains by far the largest provider in most, if not all, telephony markets (whether fixed or mobile). Second, and more importantly, Telstra still has control over many of the inputs necessary for the provision of wholesale and retail services. Control over inputs is one of the crucial elements of market power, and to focus on market share alone can be misleading.

Need for an effects test for misuse of market power

The comments in Telstra's submission with regard to the Part XIB investigations pursued by the ACCC indicate that it has played down the facts which prompted the investigations or the breaches which the ACCC suspected. For example, Telstra suggests that the Internet peering matter could have been adequately dealt with under Part IV. AAPT disagrees with this suggestion. It would have been virtually impossible to establish Telstra's purpose *before* the anti-competitive damage had been done.

The issuing of a Competition Notice in this matter meant that the ACCC could indicate promptly to Telstra what type of conduct was a cause for concern, rather than embark upon the lengthy process of litigation. By the time litigation had commenced (let alone resolved) irreparable harm would have been done to the industry. Although not a complete solution, the issuing of the Competition Notice at least provided some incentive for Telstra to negotiate reasonable arrangements with rival backbone operators, which it did.

Telstra suggests that, if there is a need for an effects test, it should be incorporated into Part IV. There is no need, Telstra argues, for an industry-specific regime as is currently found in Part XIB. AAPT agrees that there is a valid argument for an effects test of some kind to be introduced into Part IV, regardless of whether it applies only to telecommunications or to other industries which share relevant characteristics such as

[5] Telstra Submission, p. 28.

[6] see Competition Research Report, Annexure A, ch.s 5, 6.

a very high degree of market power. However, whether or not such an amendment were to be made, AAPT strongly believes that Part XIB should be retained and, if anything, strengthened. The Competition Rule, and particularly the effects test, are important aspects of Part XIB, as are the other provisions of Part XIB which are also conducive to a competitive telecommunications market.

In addition to the prohibitions against anti-competitive conduct, Part XIB contains important administrative and information-gathering provisions. Competition and Advisory Notices are important in that they give the ACCC additional powers to identify, challenge and seek penalties for anti-competitive activity, as discussed in AAPT's first submission.

Part XIB's information disclosure rules empower the ACCC to gain information which will allow it to detect anti-competitive conduct at an early stage – before the conduct can have the effect of harming consumers. The ACCC recently invoked the record-keeping rules in section 151BU to require Telstra to give it weekly updates of the roll-out of Telstra's ADSL and ULL services.[7] In addition to allowing valuable information to be obtained by the regulator, the provision also allows conduct which is cause for concern, to be scrutinised as it occurs rather than retrospectively. These powers also ensure that the Commission's other information-gathering powers in section 155 are not undermined because relevant information is not retained.

Part XIB promotes competition

Telstra asserts that Part XIB has increased the likelihood of regulatory failure.[8] It cites the example of Competition Notices issued in the Internet peering case in May/June 1998.[9] Telstra claims that the ACCC's investigation took too long and the issue of the Competition Notice involved "regulatory error" that was costly to Telstra.

AAPT disagrees that there was regulatory error, although it does agree that the investigation and issue of the Competition Notices was unduly protracted. From the time of the first complaints by industry participants (including AAPT and its subsidiary connect.com.au) until the issue of a notice was approximately six months. AAPT would have preferred a faster investigation, but notes that, once the notice was issued, Telstra rapidly signed agreements on peering. Moreover, Telstra was given repeated warnings of ACCC concerns, and the delay that did occur could be seen as an opportunity for Telstra to amend its conduct without a Competition Notice being issued. AAPT believes that the ACCC's issue of a Competition Notice was justified and produced a positive outcome for competition in the industry.

AAPT also disagrees with Telstra's claim that Part XIB has damaged the competitive process.[10] On the contrary, while AAPT is unable to comment on the specific example

[7] ACCC Media Release, 21 August 2000.

[8] Telstra Submission, p. 33.

[9] See, eg., ACCC press releases 28 May and 22 June 2000.

[10] Telstra submission, p. 53-4.

cited by Telstra, its own experience is that Part XIB has made the market more competitive than it would otherwise have been. In an industry in which one firm is so dominant, both through its control of key inputs and its market share, it is both justifiable and appropriate to have an effects-based misuse-of-market-power test and a regime which enables more prompt action to be taken in instances of anti-competitive conduct.

Private parties should be able to sue for damages under Part XIB

Currently, private parties under Part XIB can only sue for damages if a Part A Competition Notice has been issued by the ACCC. In other words, the ACCC plays a "gatekeeper" role. (Private parties may seek an injunction under Part XIB without there being a Competition Notice in force.) AAPT agrees with Cable & Wireless Optus ("**CWO**")[11] that private parties should be able to commence proceedings under Part XIB without a Competition Notice needing to be in force. This would have the effect of relieving the ACCC of some administrative burdens and accelerate the process by which anti-competitive conduct can be challenged. At the same time, the role of seeking pecuniary penalties would be left with the ACCC.

ACCC should have the power to impose standards of conduct

The ACCC, in its submission, maintained that some of the deficiencies of Part XIB were alleviated by the amendments made in 1999. The ACCC has now suggested that the legislation be further amended to allow it to prescribe standards of conduct that would promote competition and public interest criteria. This regime would enable the ACCC to issue a notice requiring a recipient to engage in a certain kind of conduct specified in the notice. In appropriate circumstances, failure or refusal to comply with the notice could be construed as a breach of the Competition Rule.[12]

AAPT would support a proposal of this kind, because the ACCC would no longer simply be pursuing anti-competitive conduct, but able to give guidance as to what kind of conduct would be regarded as consistent with the Competition Rule. The advisory notice, which can be issued when a Part A Competition Notice is in force, goes some way to fulfilling this objective. But there is a need for a *binding* notice, namely a "cease and desist order", that could be issued when anti-competitive conduct is suspected, on reasonable grounds, of occurring.[13] Because such a notice would, like a Competition Notice, have to be enforced in court, AAPT's view is that there would be no contravention of the constitutional separation of powers.

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[11] Cable and Wireless Optus, *Submission to the Productivity Commission's Review of the Telecommunications Regulatory Regime*, ("**CWO submission**"), p. 113.

[12] ACCC, Submission to the Productivity Commission Review of Telecommunications Specific Competition Regulation, August 2000, ("**ACCC Submission**"), p. 77-8.

[13] AAPT proposes a "cease and desist order" to be incorporated into Part XIB. See comments at section 5 of this submission.

4.3 Part XIC – Telecommunications Access Regime

AAPT noted that most submissions which addressed Part XIC expressed support for its retention. As it stated in its initial submission, AAPT strongly supports the retention of Part XIC and recommends reforms that would improve its operation.

AAPT notes comments made by other parties which warrant further comment. AAPT provides its commentary below.

ACCC's application of declaration criteria – section 152AL

Telstra complains that the ACCC has given too much weight to the promotion of competition, and not enough to the promotion of efficient investment in infrastructure.[14] For example, the ACCC has declared some services even when the ACCC acknowledged that the relevant market was, in part, competitive. The instance quoted by Telstra was the declaration of transmission. In a similar vein, CWO argues that services should only be declared in cases of significant market failure.[15]

AAPT notes that the LTIE test represents a balance of a range of considerations, of which efficient investment is only one. In regard to the transmission example quoted by Telstra it is clear that declaration has not inhibited either competition or investment. Indeed on many fronts both have developed in the presence of declaration, such as Nextgen's $250M recently announced project. This issue is elaborated the attached Competition and Investment Research Reports.

AAPT believes that Telstra and CWO's comments are misconceived. Under the section 152AL the promotion of competition is one of several factors to be considered. A market may have some degree of competition but that in itself may not be enough to promote the long-term interests of end-users. For example, the PSTN terminating service market may contain a number of participants, but each provider has some degree of monopoly control over access to the B-party. In that case declaration is justified because originating access providers may be subject to monopoly rents being imposed by the terminating access providers. Declaration helps to ensure that access seekers, and thus end-users, do not pay excessive amounts for the services. This has the effect of promoting the LTIE. For declaration to occur only in cases of market failure would involve the risk of end-users paying excessive prices and not receiving a wider range of services and the damage to competition would, in most instances, be irreversible.

The requirement that any-to-any connectivity be promoted also helps to ensure that new entrants are able to interconnect with larger networks, and is a legitimate concern for regulators.

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[14] Telstra submission, p. 39.

[15] CWO submission, p. 105.

AAPT also disagrees with the assertion that the criteria for declaration established in Part IIIA should replace those in Part XIC. Part IIIA has a different emphasis, and is especially concerned with services that are of "national significance". Importantly, there is a political element involved in declaration under Part IIIA, which causes a degree of uncertainty not present under Part XIC. Furthermore, there is no evidence to support Telstra's claim that Part XIC has, in any way, proved to be a disincentive to infrastructure investment. Contrary to this assertion, data available to AAPT indicates that investment is currently at the highest levels in the industry's history, as discussed in section 3 of the Investment Research Report.

AAPT thus supports the retention of the current criteria for the declaration of services under section 152AL.

Review of declarations

Telstra argues that declarations by the ACCC should be subject to full merits review in the Australian Competition Tribunal. Currently they can only be challenged in the Federal Court on administrative grounds.[16] AAPT would argue in favour of the current status of declarations, because the inquiry process leading to a declaration provides ample opportunity for interested parties to submit their views and because full merits review could result in substantial delays in the implementation of declarations, with consequent detriment to the welfare of end-users. In AAPT's view, any substantial error in relation to consideration of a declaration proposal may be answered by administrative challenges in the Federal Court. Furthermore, there is provision for services to be "undeclared".

Asymmetric regulation

AAPT notes comments by CWO[17] and Vodafone[18] that sector-specific competition regulation should only apply to the incumbent, Telstra. CWO argues that the absence of a market power requirement in Australia's telecommunications access regime is a major problem that results in new entrants being unjustifiably subject to regulation.[19] It is unacceptable, in CWO's view, for access obligations to apply to new entrants (as opposed to the incumbent) primarily because this acts as a disincentive for new entrants to build their own infrastructure, although no evidence was provided to support this contention.[20] Vodafone's argument is slightly different: namely that if

[16] Telstra submission, p. 42.

[17] CWO submission, p. 136.

[18] Vodafone, Submission to the Productivity Commission: Review of Telecommunications Specific Competition Regulation ("**Vodafone submission**"), p. 28

[19] CWO submission, p. 135.

[20] CWO submission, p. 136.

Part XIB is retained, it should only apply to Telstra, and not to other carriers which later acquire market power.[21]

AAPT rejects these arguments as misconceived and opportunistic. Given that the objective of declaration is to promote the LTIE, and not competition, per se, there may be instances when declaration of a certain service should apply to *all* providers of that service, even where that service may not be subject to a natural monopoly. In the case of PSTN terminating access services, for instance, each provider effectively has bottleneck control over calls to customers connected to its network. In such instances, at least some degree of access regulation is justified, even where the provider may be a new entrant and/or small. In addition, carriers may apply for an exemption from access obligations, and the ACCC can grant relief from such obligations where to do so would be in the LTIE.[22] AAPT would oppose the introduction of asymmetric regulation.

Both CWO and Vodafone advanced the proposition that the requirement for any-to-any connectivity would be achieved if a service provider could gain interconnection to a (dominant) carrier. Such as assertion is clearly flawed. In regimes more heavily regulated than Australia's the incumbent or dominant carrier is not only subject to obligations in relation to interconnection, but it is also obliged to offer "transit" services. In the Australian market there is no obligation on any carrier to provide transit services and no proposal for declaration of such a service has been made. A number of carriers, including AAPT, provide variants of a "call termination service" that do provide a version of transit but in all circumstances significant functionality is lost.

Enforcement of the Standard Access Obligations

Under section 152BB, private parties or the ACCC may apply to the Federal Court in the case of a contravention of a SAO, to seek compliance with it by the access provider.

CWO suggests that the SAOs are not an effective constraint on Telstra (or any other access provider) because it is not obliged to report regularly to the ACCC on its compliance with the SAOs. AAPT would agree with CWO that Telstra does (at least on occasion) discriminate in favour of its own retail divisions. In the absence of any obligation on Telstra to give regular reports to the ACCC on its compliance with the SAOs, other carriers often face a difficult task in showing that Telstra has not provided services to rivals on terms that are as favourable as the terms on which it supplies itself.

AAPT would support the introduction of some kind of on-going reporting obligation for Telstra. AAPT notes, however, that such reporting can be achieved without new

[21] Vodafone submission, p. 28.

[22] Section 152AS and 152AT of the TPA.

legislation, as the tariff-filing and record-keeping rules provide the ACCC with adequate powers.

TSLRIC and interconnection rates

AAPT notes that Telstra objects to the ACCC's use of TSLRIC based on costs incurred by an efficient carrier in determining interconnection charges. Telstra regards the use of TSLRIC as unreasonable and inconsistent with the commercial realities of building and maintaining a network and telecommunications services.[23] Telstra argues that the ACCC has failed to use appropriate input parameter values, leading to inaccurate results.

AAPT has previously commented that it considers assessment of pricing principles is outside the terms of reference of the review. Notwithstanding, AAPT strongly supports the retention of the ACCC's TSLRIC pricing model because it is designed to promote the most efficient form of network and service provision. Access seekers and end-users should not be forced to shoulder the burden of a telecommunications service that is provided in an inefficient way.

AAPT disagrees with Telstra's argument that the TSLRIC model creates distortions in investment by encouraging entrants to buy services from the incumbent, as opposed to investing in their own facilities. Rather, TSLRIC gives all carriers a clearer picture of what the efficient costs of building networks and providing services should be. If new entrants believe that they are able to provide a service more efficiently or cheaply than the incumbent, they will have a strong incentive to build. AAPT points to the large amount of investment in infrastructure made by new entrants since mid-1997 as evidence that the ACCC's pricing approach is sound. (AAPT also commented on this in its Initial Submission.)

Interim determinations and review before the ACT

Telstra is critical of the introduction of interim determinations in Part XIC, stating that these erode the incentives for access seekers to seek negotiated commercial outcomes.[24] This is supposedly because interim determinations can be issued without reference to the LTIE criteria and are not subject to (administrative) challenge. AAPT believes that the non-appellability of interim determinations is important in that it ensures that they will not be subject to an ongoing round of challenges, when the parties to an arbitration require some degree of certainty as to their rights and obligations.

In any case, Telstra ignores the availability of backdating in section 152DNA, which allows any errors that may have occurred in interim determinations to be corrected and ensures that a party which may have incurred unjustifiable loss is reimbursed.

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[23] Telstra Submission, pp. 22, 44, 50.

[24] Telstra submission, p. 45.

AAPT would also argue (as it has elsewhere) that backdating should be permitted to the date on which the dispute arose, or at least the date the dispute was notified.[25] Additionally, a final determination may be challenged in the Australian Competition Tribunal by an aggrieved party to an arbitration.[26] AAPT submits that the interim determination and the appeal mechanisms are sound and fair (subject to its concerns about the current limitations on backdating).

Whether multilateral arbitrations should be permitted

Several submissions addressed the question of whether arbitrations should be conducted on a multilateral basis. Currently arbitrations can only be conducted on a bilateral basis. The ACCC supported the introduction of a right to combine arbitrations[27] and also to publicise final determinations. AAPT would support the first of these proposals, but has some reservations about the second.

AAPT refers the Productivity Commission to its comments below in respect of joint public arbitrations (see section 5, below). The combination of two or more arbitrations about the same (or substantially the same) services would ensure consistency, while keeping open the possibility of variation between particular arbitrated outcomes. Combining arbitrations would also reduce administrative costs both for the ACCC and market participants, as access issues of major significance could be resolved more quickly and coherently alleviating the need to reinvent the wheel during arbitrations involving the same service.

4.4 Other issues

A number of submissions, including AAPT's, addressed the role of convergence and the telecommunications industry. CWO argued that convergence would not necessarily reduce barriers to entry in the telecommunications market. Indeed, converging technologies can often give firms with market power an opportunity to further entrench their power in that market and to stifle competition in related (downstream) markets. AAPT similarly believes that the effects of converging technologies, though requiring careful assessment, should not be exaggerated or seen as removing the need for sector-specific regulation.

AAPT has provided additional comments on convergence in another section 6 of this Submission.

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[25] Item 74 of the *Telecommunications Legislation Amendment Act 1999* prevents final determinations being expressed to take effect before 5 July 1999 at the very earliest. In any case, no final determination can be expressed to have taken effect prior to the notification date of the dispute: subsection 152DNA(2) of TPA.

[26] Section 152DO of TPA. Subsection 152DN(2) of TPA. The ACT has discretion as to whether it will issue a stay. If a stay is granted, the ACCC may issue an interim determination pending the outcome of the review: subsection 152DN(6).

[27] ACCC Submission, p. 87.

5. RECOMMENDED REFORMS TO REGIME

In its presentation to the public hearing on 14 August AAPT identified difficulties in progressing arbitrations under Part XIC of the TPA. AAPT set out several approaches which could provide incentives in the regulatory regime, to encourage incumbent providers to provide access to information and to allow timely access to services.

This section discusses two areas of reform of the current regime which AAPT considers crucial:

- the introduction of incentives to commercial negotiation of access arrangements under Part XIC;
- the provision of a power for the ACCC to issue "cease and desist" orders in connection with its powers and functions under Part XIB.

5.1 Incentive regulation and incented negotiation

The Productivity Commission in its issues paper asked whether there was any potential for the introduction of "incentive regulation" in the telecommunications regime.

The term incentive regulation has traditionally been used (in the US and UK) to refer to those forms of regulation which seek to limit the ability of a regulated firm to charge monopoly prices, while providing some incentive for it to lower costs and therefore increase profits.[28] Typically, this is achieved through the imposition of a price cap based on a yearly price index ("RPI-X"), rather than regulating the rate of return the firm is permitted to earn.

The intention of such regulation is to mimic the outcomes of a competitive market, which would effectively set a price cap on goods and services, and would reduce the price the firm could charge where technological innovation is likely to be significant, such as in telecommunications.

Another more recent sense in which the term has been applied is in relation to the provisions of the US Telecommunications Act 1996 ("**US Act**") which provide an incentive to incumbent local exchange carriers ("**ILECs**") to open their local infrastructure in return for access to the long distance ("**inter-LATA**") markets.

The basis for this form of incentive regulation is the modified final judgment delivered in the *US v AT&T* decision in 1982 and the regulations which followed that decision. Relevantly, the effect of that decision was to impose a series of "line of business" restrictions on the regional Bell Operating Companies ("**RBOCs**"), which prevent them from entering into telecommunications markets outside the local

[28] see, eg, Ai, C. and Sappington, D. E. M., *The Impact of Incentive Regulation on the US Telecommunications Industry*, 1998 (available at: http://bear.cba.ufl.edu/sappington/papers/Ire.pdf)

telecommunications markets. The Telecommunications Act 1996 includes provisions (notably section 251) which require the ILECs to provide interconnection and unbundling of network elements.

The US 1996 Act also included a provision (section 271) which created an incentive for the ILECs to open their networks. As a condition of entry to the inter-LATA markets, the ILECs are required to satisfy a "competitive checklist" which aims to establish that they provide non-discriminatory, cost-based access to their local telecommunications infrastructure to competing local exchange carriers ("**CLECs**"). In adopting this approach, the Congress explicitly set out its objective of offering an incentive to the RBOCs to open local markets[29].

Incentive regulation in the Australian context

AAPT does not propose that the Productivity Commission recommend one of the forms of the incentive regulation discussed above. We note that the conditions which gave rise to the US model of incentive regulation (namely, restrictions on "line of business") are not present in the Australian market. In effect, Telstra is not prohibited from participating in any particular market and, there are very few services which Telstra needs to acquire from other market participants.

The current regulatory regime is also generally inconsistent with an RPI-X approach to pricing (at least at the access level). Because current prices for many relevant services are likely to be significantly above cost, such an approach may not assist the development of competition within a sufficiently short time frame. There may be some benefit, through the provision of certainty, in the adoption of an RPI-X approach to capping future interconnect prices once cost-based standards have been implemented.

Incented negotiation

AAPT proposes that an Australian approach could be based on a notion of "incented negotiation" which is more limited in scope. The proposals set out here are intended to provide incentives to access providers with market power to negotiate and enter into, fair and reasonable agreements with access seekers. Negotiations would be encouraged as access providers become aware of the greater risk they would be exposed to if they fail to negotiate reasonable agreements and are forced into arbitration.

In AAPT's experience, the substantive results of the regulatory processes are sound, however, the process by which those results are achieved can be improved in terms of speed, access to information and decision-making.

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[29] The debates on the bill in August 1995 revealed bipartisan support for the incentive-based approach, see Sloan, T. "Creating Better Incentives Through Regulation: section 271 of the Communications Act of 1934 and the promotion of local exchange competition, 50 *Federal Communications Law Journal* 309, 310.

As was evident from discussions at the Productivity Commission's public hearing, the significant issues which give rise to a bargaining problem are:

- market power of a vertically integrated incumbent;
- asymmetry of information access;
- incentive for access-providers to delay arbitrations and the provision of access generally.

AAPT's intention in proposing alternative approaches is to encourage discussion of mechanisms by which the success of commercial negotiations can be enhanced and the current barriers to the efficient conclusion of arbitral outcomes, reduced. Although AAPT considers that the adoption of any of the proposals would contribute to such a result, a combination of elements of all proposals may be preferable.

Mandatory undertakings

Under this proposal, all providers of an active declared service (or, under a more conservative approach, the dominant provider) would be required to lodge with the Commission an undertaking within a certain time, the terms and conditions of which would be available to all access-seekers.

Of course, an important issue to be decided is whether the undertaking should meet any particular criteria. On one view, the primary requirement should simply be to provide an undertaking, rather than the contents of that undertaking.[30] Alternatively, it may be sufficient to adopt an approach under which undertakings are required to meet basic standards (such as compliance with the SAOs) with the expectation that the public nature of the undertakings would create an imperative that they be reasonable and, where an industry Code exists, consistent with that Code. Enforceability of the undertakings would be the same as the current voluntary undertakings, with parties being held to their own standards of access. Enforcement could therefore be expected to be more efficient.

A more demanding version of this approach would include an assessment by the Commission against criteria such as "reasonableness", currently included in paragraph 152BV(2)(d). Although in the early stages this approach would be resource-intensive, as the industry and the Commission gained expertise in assessing undertakings, it would likely become more straightforward and expeditious. Further, the public consultation process currently required for undertakings under section 152BV could be included as a discretionary element for the Commission.

[30] For a discussion of the theory underlying such an approach, see Braithwaite, J and Ayres, *Responsive Regulation*, ch. 4, "Enforced Self-Regulation".

Joint public arbitrations

Under this proposal, the arbitration process would be made more efficient by bringing together similar arbitrations into a single process. As an example, there are currently five separate arbitrations in relation to the local carriage service against Telstra, and at least three arbitrations in respect of the unconditioned local loop service. Although some of these disputes may involve issues unique to particular access-seekers, it is likely that, in most instances, the basic facts and issues to be determined will be the same in all disputes.

AAPT does not consider that there is always a justification for differential pricing and terms and conditions of access between different access-seekers. In many instances, variations in the access prices available to different access-seekers are not based on legitimate factors such as the costs of provision, but on different degrees of bargaining power. However, there are particular circumstances where differences can be justified on the basis of, say, traffic volume or network topology. Under such circumstances, these differences should be accommodated within the terms of the particular arbitral outcome.

Furthermore, if the Commission were of the view that differential negotiated outcomes were desirable, this could also be accommodated through a "second phase" of negotiations following a joint arbitration. That is, once a broad arbitral outcome had been reached, the parties would be free to negotiate particular arrangements reflecting the unique circumstances of supply, based on the arbitral outcome as a benchmark.

This proposal has the advantage of reducing the costs of arbitrations significantly and ensuring that competition in downstream markets is not distorted by the superior negotiating power of one access seeker over another. Furthermore, it would create an incentive for access providers to negotiate agreements with access-seekers (particularly smaller access-seekers) because the differences in bargaining power would be substantially lessened as all access-seekers would be parties to a single arbitration.

On the other hand, there are likely to be some difficulties implementing such an approach. First, it would be necessary to arrive at criteria against which the commonality of interests of participants in an arbitration could be assessed, as under class action litigation rules. Second, the presence of a large number of parties may slow down the progress of the joint arbitration. However, in AAPT's view, this is unlikely to result in the overall process being slower than under the current regime.

Information presumptions

A key factor in the delays experienced in arbitrations and declaration processes, in AAPT's view, is the information asymmetry which characterises arbitrations. In the great majority of instances access-providers possess data which they are reluctant to disclose to access-seekers or the Commission. A possible solution is to construct an incentive for incumbent carriers and access-providers to disclose information where a factual matter is uncertain but known to the carrier.

The current provisions in the legislation grant the Commission a range of information gathering powers intended to allow it to compel the access-provider to disclose information.[31] Instead, AAPT proposes that the Commission be empowered to make a "regulatory presumption" against the interests of the access-provider where a factual matter is uncertain but the access provider is in the best position to obtain the information. The presumption would be rebuttable by the provision of independently verified data. Such an approach has two advantages over the current approach:

- it creates an incentive for information to be disclosed; and
- it places the onus on the party which is able to obtain the relevant information at least cost.

Reference prices

One way in which the above proposal could be usefully applied would be in the setting of prices of access. The extensive delays the industry has experienced in seeking to determine total service long-run incremental price for access to the PSTN network demonstrates the practical result of information imperfections in the industry. Even when the Commission and its consultants arrived at a reasonable figure, there was no legislative mechanism available which allowed the price to be widely applied.

As an alternative, the regime could provide a power for the Commission to make a binding determination of a reference price, following a public inquiry and based on the regulatory presumptions indicated above. In the case of important interconnection services (similar to the PSTN services) this could be done as part of the declaration process. It may also be advisable for prices only to be set in relation to dominant networks with a less interventionist approach (such as setting pricing principles) applied to non-dominant networks. AAPT notes that the Commission has already taken steps in this direction through its recent public processes in relation to the pricing of GSM and non-dominant PSTN networks.

The reference price would be available to access-seekers, subject to a "payback" condition that required them to remit to the access-provider the difference between the reference price and a price finally determined in an arbitration or assessment of an access undertaking if the latter were high. Such a mechanism would provide access-providers with protection against prices being set too low in the interim, and would create an incentive on both sides for the final access prices to be determined. A similar approach is currently in place with regard to interim determinations.

Again, the fact that access-seekers were able to acquire services on prices which the access-providers may consider too low, will create an incentive for access-providers

[31] The powers include sub-section 152BBA(3) (powers to give directions in relation to negotiations), section 152BT (to request information relevant to an undertaking), section 152CT(2) and section 152DC (to give directions in relation to arbitrations), section 152DD (power to summon witnesses to appear or provide documents), section 155 (the general information-gathering power).

to supply information or expedite arbitral processes, in order to assist the Commission to arrive at a "correct" final price.

Regulatory timeframes

The Commission has previously considered the imposition of timeframes for the conclusion of various processes under Parts XIB and XIC. On 17 May 1999 the Commission announced timeframes with respect to declaration processes and investigations of alleged anti-competitive conduct. However the timeframes were not intended to apply to arbitrations.

While AAPT would generally support mandatory timeframes, it recognises that there are some limitations to this approach. First, the imposition of a timeframe does not necessarily assist the achievement of the "correct" result in an arbitration. In fact, the need to progress a matter may, in some cases, result in a flawed decision. However, these instances may be accommodated through provision for extensions to timeframes where necessary and where agreed with the parties.

Second, the delays in processing arbitrations and other access processors are generally the result of inadequate resources available to the Commission, rather than any lack of application to the performance of the Commission's functions. Although the imposition of timeframes may assist the Commission make arguments in favour of increased resources, they will not in themselves increase the available resources for completing arbitral tasks. Nevertheless, AAPT notes that in other areas where decisions are "time-critical", such as merger assessment, legislative timeframes are well established.

Timeframes will only assist in the resolution of arbitrations if they facilitate the participation of parties to the arbitration. For example, if the access provider has to provide service in accordance with a reference price then rapid resolution of the issue may be in the access provider's interest. In this circumstance a requirement for an arbitration to be concluded within a specified period or have the reference price prevail would encourage the provider to be more open in its negotiation.

Conclusion

There are a number of alternative modifications that could be made to the process of arbitrations to address the information asymmetry inherent in the negotiation process. AAPT encourages the Productivity Commission to seek other participants views on these alternatives.

Without limiting the generality of that suggestion, AAPT believes that the inclusion of provisions for reference prices and information presumptions would provide the ACCC as arbiter with the ability to provide incentives to more rapid resolution of disputes.

5.2 Proposal for the introduction of cease and desist orders

Part XIB of the TPA provides for a range of mechanisms by which the ACCC can address anti-competitive conduct in the telecommunications industry. The most obvious of these is the Competition Notice. The tariff-filing and record-keeping rules also allow the ACCC to monitor more closely any conduct that could amount to a breach of the Competition Rule.

AAPT supported the introduction, in mid-1999, of the Part A and Part B Competition Notice provisions as well as the introduction of the advisory notice, which is a non-binding notice that the ACCC can issue to a recipient of a Part A Competition Notice. The advisory notice is intended to guide the recipient on how it can change its behaviour, so as to cease breaching the Competition Rule.

AAPT believes that the power to issue a "cease and desist" order would be an important new instrument in the regulatory framework.

Part XIB was intended to give the ACCC the ability to respond quickly to perceived or alleged anti-competitive conduct in the telecommunications industry. The ACCC is, in many circumstances, effectively constrained in its ability to act expeditiously. The ACCC is required to undertake a complex and lengthy investigative process before it can issue a Competition Notice, even if there may be convincing prima facie grounds to suspect a breach of the Competition Rule. As a result, while the ACCC is undertaking an investigation, a carrier could be acting in a seriously anti-competitive manner which cannot be fully or adequately redressed at a later stage. This can occur because pecuniary penalties can only be imposed for conduct which occurs *during* the period in which the Competition Notice is in effect.

Further, the effects of anti-competitive conduct may be irreversible, ie, the damage to competition and the market may be done before the Commission can act. (The one exception is that a party may seek an injunction under Part XIB without a Competition Notice being in force.[32])

The fact that delays are almost inevitable when the ACCC exercises its powers under Part XIB, is a cause for concern. This is not a criticism of the ACCC, but an inevitable aspect of the legislative and administrative framework within which it operates. A carrier could engage in short-term, but nonetheless harmful, conduct towards competitors and thus damage the competitive process and end-users in particular. This is particularly important where an incumbent shows a predisposition to delay corrective action by engaging in litigation. In AAPT's view, there is a clear need for a more expeditious method of redress in such instances.

AAPT recommends that the power for the ACCC to issue "cease and desist" orders be introduced into Part XIB. Such a power would allow the ACCC to issue such an

[32] Section 151CA of TPA.

order whilst conducting an investigation. The order could be given a relatively short period of operation (eg. 90 days), that would prevent a recipient of such an order being constrained for an excessively long period. The ACCC could be empowered to issue such an order where, for example, there are reasonable grounds to suspect that the anti-competitive conduct was taking place and that failure to take prompt action would result in significant damage to competition.

It is worthwhile to note that the Federal Communications Commission in the United States has broad powers to issue cease and desist orders under the Communications Act 1996.[33] The recipient is usually given notice and an opportunity to make submissions to the Commission before any such notice is issued.

In the Australian context, the issue of a cease and desist order would (and should) be made subject to the usual administrative law requirements. In order to prevent the undue delays that often affect the issue of a Competition Notice, a short notice period (eg. 14 days) should be given to allow the would-be recipient the opportunity to cease the conduct voluntarily, and/or make any submissions. A notice period should not be too long however, as this would defeat the purpose of issuing a cease and desist order in the first place. The cease and desist order would take effect on the expiry of the notice period.

If the conduct were to continue during the period of the cease and desist order, the ACCC could then issue a Part A or Part B Competition Notice. The Federal Court should also be given the power to impose pecuniary or other penalties for a breach of a cease and desist order.

Importantly, such an order would not involve a final determination of any party's rights or obligations, but would simply be an interim measure to preserve the status quo. As with a decision to issue a Competition Notice, a decision to issue a cease and desist order could be made subject to review in the Federal Court.[34] Accordingly, it appears unlikely to AAPT that such a power would be invalid on constitutional grounds.

[33] Section 312 of the United States *Telecommunications Act* (47 USC 5).

[34] Section 151AQA allows a person to seek judicial review of the decision to issue a Competition Notice, and for any proceedings to enforce the competition to be stayed.

6. OTHER ISSUES

This section of AAPT's submission addresses two contextual issues which AAPT considers should inform the Commission's consideration of all issues covered by the Terms of Reference: convergence and globalisation.

The impact of convergence increasingly defines the debate on regulation of communications industries overseas, particularly in Europe. Partly this is a result of the more advanced state of development of competition in these countries, which has created new competition challenges (mergers, strategic alliances, bundling and vertical integration) assuming greater importance than "traditional" telecommunications regulatory issues (principally access). Rather than suggesting the winding back of the existing regime, these developments indicate a need to develop the regime so that it is effective in the next phase of the development of communications markets.

The second part of this paper discusses Australia's obligations under the Fourth Protocol to the General Agreement on Trade in Services ("GATS"). The section points to one basic element of globalisation in telecommunications, namely, the obligations upon states to abide by internationally agreed norms and protocols. In the case of telecommunications regulation, this requires Australia to effectively protect competition and ensure fair access to networks.

6.1 Convergence

The Commission has sought comment on the role of convergence in telecommunications regulation. AAPT provided some comments in its initial submission. AAPT notes the extensive consideration that has been given to the implications of convergence on competition law. AAPT notes in particular that:

- convergence may create more situations in which network effects are likely to affect competition; and

- convergence is providing opportunities for participants to leverage market power from one market to another.

This document summarises the views of various overseas regulators on convergence. Foreign regulators have generally concluded that industry-specific regulation is needed, at least in the medium term. This industry-specific regulation should be supplemented by general competition laws.

National Office of the Information Economy ("NOIE")

NOIE defines convergence as "service-sector restructuring enabled by digitalisation". This definition is used because of what NOIE sees as three main characteristics of the convergence process:

- that all knowledge-based and transaction-intensive service sectors are affected, not just telecommunications and broadcasting;

- that convergence is *structural* in nature, and changes to industry structure are the most profound changes associated with convergence; and

- that convergence is enabled by technological change, but is not driven by it. The drivers of convergence are commercial.[35]

NOIE identifies many traditional service industries as having high barriers to entry and bottlenecks which need to be addressed through access regimes. Where incumbents have dominant positions in the provision of infrastructure, there is a need for "asymmetric regulation". AAPT would generally agree with this, but stresses that legislation should be directed at anti-competitive conduct by firms with "substantial market power" not particular firms. AAPT would also add that convergence does not necessarily mean a lowering of barriers to entry. Indeed, the fact of convergence may increase the importance of bundling, which in turn creates a need for new entrants to enter several markets simultaneously. Further, the power of a firm in one market (eg. access to the local loop) can potentially be used to leverage market power in related markets (eg. Internet access).[36]

United Kingdom Government Reports on Convergence

The British Department of Trade and Industry ("**DTI**") has published a number of reports on convergence. DTI's Green Paper *Regulating Communications: approaching convergence in the Information Age* (1998)[37] asserted that convergence would dissolve barriers between such tasks as content creation, content distribution and the manner in which consumers gained access to content. While this development would improve the bargaining position of content-creators, it would also further enable businesses to leverage their market power vertically. One example of this would be a content-creator being able to leverage its power in that market into distribution markets (or the reverse). Convergence would thus give incumbent businesses in one industry (such as broadcasting) the ability to acquire power more easily in other markets.

DTI maintained that an incremental approach to regulatory change was required. It was wrong to assume that convergence would remove market power from incumbents, but convergence could change the ways in which market power could be acquired or maintained.[38]

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[35] NOIE, *Convergence Review: Final Report*, (May 2000), p. 11.

[36] Indeed, similar concerns were one of the reasons that the ACCC opposed the proposed acquisition of Ozemail by Telstra. See ACCC media release, 28 January 2000.

[37] www.dti.gov.uk/converg/exec.htm

[38] Ibid.

DTI concluded that the possibilities outlined by it would require stronger competition law regulation, preferably through two distinct regulators. One regulator would control economic issues (and therefore administer competition law), the other would address content and cultural issues.

In another report,[39] Oftel supported a dual-regulation role of the kind recommended by DTI. Submissions to the Green Paper mostly argued for an evolutionary approach to the regulation of converging industries. It was thought that general competition law, coupled with sector-specific regulation, would be appropriate for some time, but that the need for the latter would probably decrease over time.[40] Oftel has indicated that it favours pursuing a less interventionist approach in future (eg. less reliance on enforcement of licence conditions). Alternatively, Oftel will place greater reliance on enforcing the new UK *Competition Act* to specific problems within the UK telecommunications industry, thereby meaning sector-specific investigation and enforcement will continue.

European Commission Reports on Convergence

The European Commission ("EC") has produced a great deal of commentary on convergence issues. In its *Green Paper on Convergence*, the EC concluded that convergence was taking three principal forms: technological, industrial and regulatory.

Technological convergence is already well under way in many markets. Industrial convergence is proceeding at an increasing pace, especially as mergers between media and telecommunications companies become more prevalent. Regulatory convergence exists to an extent, but there are still industry-specific regulators which often do not have overlapping functions. (This is mirrored in Australia, where, for example, the ABA regulates television and radio broadcasting spectrum, whereas the ACA regulates mobile telephony spectrum.)

Importantly, the EC's conclusions in its Communication to the Council of the European Communities recognised that sector-specific rules would continue to be necessary in telecommunications, broadcasting and other information technology industries. Sector-specific rules should operate concurrently with general competition laws and an increasing reliance on industry self-regulation. Sector-specific rules also will guarantee equal opportunities to all market operators until there is proper competition.[41]

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[39] Oftel, "Beyond the Telephone, the Television and the PC – III", March 1998. Available at www.oftel.gov.uk.

[40] The final report or White Paper had not been released at the time of writing.

[41] EC, *Communication to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions: convergence of the telecommunications, media and information technology sectors, and the implications for regulation – results of the public consultation on the Green Paper*, (10 March 1999), p. 6.

The EC noted that, in some industries, there was a preference for an evolutionary rather than a revolutionary approach. Industry participants (other than incumbents) identified improved access to essential facilities, particularly through local loop unbundling, as crucial to fostering competition. AAPT concurs with these views, noting that it would be far too premature to remove sector-specific regulation in an industry in which bottlenecks are still widely prevalent.

Canadian Radio-television and Telecommunications Commission ("CRTC")

The CRTC expressed a particular concern that bottleneck access to local telecommunications services may hinder the development of other services delivered via telecommunications facilities. For example, telecommunications companies have the capacity (and potentially, the incentive) to exclude broadcasters or other content providers from delivering their services to end-users. This is particularly likely to occur where the telecommunications company wishes to establish its own broadcasting (or datacasting) service.

The CRTC suggests a form of incentive regulation, whereby telecommunications companies would be denied the right to apply for broadcasting licences until there was competitive access for content providers who wanted to use bottleneck services, like customer access.

Conclusion

This brief review shows that regulators in most other major jurisdictions are alert to the unique challenges posed by convergence. While it is obvious that the technological changes inherent in this process will require adaptive and prescient legislation, there will remain a strong need for sector-specific regulation in the telecommunications industry for the foreseeable future. The fact that other technologies (such as broadcasting) are gradually adopting some of the features of telecommunications (such as interactivity) does not remove the need for sector-specific regulation.

If Part XIB of the TPA were to be repealed (which AAPT opposes) there would still be a need for sector-specific rules to be incorporated into the general competition regime (Part IV). For example, this could take the form of a special rule governing conduct in industries characterised by pronounced network effects, such as telecommunications. Similarly, the repeal of Part XIB would necessitate a consideration of whether an effects-based test of misuse of market power should be introduced in Part IV, at least in relation to industries where the market power of a firm is particularly pronounced.

Similarly, any proposal to repeal Part XIC would need to be matched by recommendations to amend Part IIIA to incorporate telecommunications and other networked industries.

6.2 COMMENTS ON WTO OBLIGATIONS WITH RESPECT TO TELECOMMUNICATIONS

Outline

Australia is a signatory to the General Agreement on Trade in Services ("**GATS**"), which requires signatories to liberalise their service industries, including telecommunications. The Fourth Protocol to the GATS, signed by Australia in 1997, requires signatories to have a regime which provides:

- protection against certain practices which have "anti-competitive results";
- an effective interconnection regime which ensures timely access on non-discriminatory, cost-oriented rates.

It is arguable that the requirements of the Fourth Protocol are not met by Parts IIIA and IV of the *Trade Practices Act 1974* ("TPA") alone.

Additionally, the Fourth Protocol to the GATS specifies how Member states are to liberalise their telecommunications industries and what kinds of practices or regulation are prohibited or to be phased out. Australia became a signatory to the Fourth Protocol on 15 April 1997, which then came into effect on 5 February 1998. Australia made a number of specific commitments under the Fourth Protocol which are detailed below.

Australia's obligations under GATS

As a matter of international law, Australia is bound by the GATS (including the Fourth Protocol). This requires the Commonwealth Government to take measures necessary to ensure that the GATS obligations are given effect. These obligations are detailed below.

Under the GATS, "trade in services" includes the supply of services by a service provider of one Member country operating in the territory of another Member. Accordingly, the obligations discussed here apply with regard to the provision within Australia of services by foreign telecommunications service providers.

Importantly, the actions of private organisations can result in a government being in breach of its treaty obligations. Such a situation may arise if a government has not taken adequate measures to prevent the actions of private organisations which are in conflict with relevant Treaty obligations. In the present context, if Australia's domestic laws permit anti-competitive or access-denying conduct of a kind which the GATS requires it to take action to prevent and an organisation engages in such conduct, Australia may breach its obligations.

Services covered

The Annex applies to "public telecommunications transport networks and services." This term is then defined broadly to include any services offered to the public generally[42] and the infrastructure used which permits telecommunications between defined network termination points. The services covered by obligations under the Fourth Protocol are enumerated by the WTO members themselves, in an annexure to the Protocol. Australia has nominated the following services:

- Voice telephone services
- Packet-switched data transmission services
- Circuit-switched data transmission services
- Telex services
- Telegraph services
- Facsimile services
- Private leased circuit services
- Other:
    - Digital cellular services
    - Paging services
    - Personal communications services
    - Trunked radio system services
    - Mobile data services
    - Services covered by the Broadcasting Services Act 1992 are excluded from the basic telecommunications sector

Anti-competitive conduct

Paragraph 1 of the Reference Paper to the Fourth Protocol, entitled "Competitive Safeguards", states that "appropriate measures shall be maintained for the purpose of preventing suppliers who alone or together are a major supplier from engaging in or continuing anti-competitive practices." (subsection 1.1).

[42] The inclusive list of examples given states: "telegraph, telephone, telex and data transmission typically involving real-time transmission of customer-supplied information between two or more points without any end-to-end change in the form or content of the customer's information."

Sub-paragraph 1.2 states that the anti-competitive practices referred to in sub-paragraph 1.1 shall include in particular:

- engaging in anti-competitive cross-subsidisation;
- using information obtained from competitors with anti-competitive results; and
- not making available to other service suppliers on a timely basis, technical information about essential facilities and commercially relevant information which are necessary for them to provide services.

These provisions clearly indicate that Australia is obliged to have an effective regime which safeguards competition in the telecommunications industry. The reference to anti-competitive *results* in sub-paragraph 1.2(b) above further suggests that there is a need for an "effects" test when assessing misuse of market power.

Interconnection

Sub-paragraph 2.2 of the Reference Paper states that:

> *[I]nterconnection with a major supplier will be ensured at any technically feasible point in the network. Such interconnection is to be provided:*
>
> *(a) under non-discriminatory terms and conditions including technical standards and specifications and rates and of a quality no less favourable than that provided for its own like services or for like services of non-affiliated service suppliers or for its subsidiaries or other affiliates;*
>
> *(b) in a timely fashion, on terms, conditions (including technical standards and specifications) and cost-oriented rates that are transparent reasonable having regard to economic feasibility and sufficiently unbundled so that the supplier need not pay for network components or facilities that it does not require for the service to be provided; and*
>
> *(c) upon request, at points in addition to the network termination points offered to the majority of users subject to charges that reflect the cost of construction of necessary additional facilities,"*

Accordingly, Australia is obliged to have an access regime in the telecommunications industry which adheres to at least the following principles:

- non-discrimination with regard to both price and non-price terms and conditions;
- cost-oriented pricing of access;
- unbundled access to network elements

- timeliness;
- transparency.

Other obligations relevant to competition regulation

Paragraph 5 of the Reference Paper indicates that there must be a regulatory body for the telecommunications industry that is separate from and not accountable to any supplier of basic telecommunication services. The decisions of and the procedures used by regulators shall be impartial with respect to all market participants. This requirement suggests that there needs to be a regulator or regulators such as the ACCC or ACA which are able to enforce competition law and access law in the telecommunications industry.

Furthermore, the reference to regulators implies that a general competition regime which can be enforced only by private parties is not sufficient in promoting competition in the telecommunications industry. There appears to be a requirement that an independent government regulator which can enforce telecommunications-specific competition and access regulation, be created and maintained.

Paragraph 6 of the Reference Paper also requires that the allocation and use of "scarce resources", such as spectrum, numbers and rights of way are to be in accordance with similar principles to those which apply to the services, namely "objective, timely, transparent and non-discriminatory". These obligations are relevant to the consideration of some elements of the *Telecommunications Act 1997*, particularly number portability and facilities access provisions.

How can Australia comply with its GATS obligations?

On one view Parts IIIA and IV of the TPA would be sufficient to fulfil Australia's obligations under the Fourth Protocol. However, AAPT is of the view that Parts XIC and XIB must be retained in order to meet these obligations. It comes to this conclusion for the following reasons:

- with regard to competitive safeguards, subsection 1.2 in the Fourth Protocol refers to "anti-competitive *results*" [Emphasis added], which strongly implies that any competition legislation governing the telecommunications industry has to focus on *effects*;
- with regard to interconnection, Part IIIA does not provide a basis for declaring the services covered by the Fourth Protocol, nor does it require terms and conditions of access to be set in accordance with the principles set out there;
- the general provisions of Parts IIIA and IV do not include sufficient detail to ensure the technical aspects of Australia's obligations relevant to interconnection are met;

- Australia has indicated that Parts XIB and XIC are the primary mechanisms by which it meets its obligations.

Further, it is arguable that the current regime should be extended to ensure that some obligations under the Fourth Protocol (particularly non-discrimination and transparency) are fulfilled.

Anti-competitive conduct

The information-gathering powers (section 155 of the TPA, the tariff-filing and record-keeping rules) facilitate the enforcement of the effects test by giving independent regulators the power to obtain information from carriers that could indicate anti-competitive behaviour (such as cross-subsidisation, which is specifically prohibited by the Fourth Protocol). In other words, the Fourth Protocol implies that it is not enough for a signatory such as Australia to have a misuse of market power prohibition which only includes a reference to a proscribed *purpose* (as is currently found in section 46 of the *Trade Practices Act* 1974 ("TPA")).

Interconnection

Section 2 of the Fourth Protocol refers to interconnection issues and subsection 2.2 has a detailed list of the kinds of factors that have to be safeguarded in an interconnection regime. These factors include such things as supply under non-discriminatory terms, provision of services in a timely fashion and provision of services in a reasonably transparent and economically feasible manner. These sorts of requirements are found in general terms in Part XIC of the TPA. Part IIIA does not go as far in safeguarding these sorts of entitlements. For example, Part IIIA does not fully address the special concerns that are associated with networked industries, in which an ability to interconnect with a dominant network is crucial to the ability of new entrants to compete. Part IIIA would not be an adequate substitute for the current Part XIC regime.

Footnote 6 to the Reference Paper states

> *"The interconnection regime to apply in Australia from 1 July 1997 (subject to Parliamentary passage of the necessary legislation) will provide access on terms and conditions which are fair and reasonable to all parties and which do not unfairly discriminate between users. Access rights will be guaranteed by legislation and the terms and conditions of access will be established primarily through processes of commercial negotiation or by reference to access undertakings given by access providers which may draw upon an industry code of practice. Any code of practice and each access provider's undertaking will be subject to approval by the independent regulator.*

Footnote 7:

> *Non-discrimination is taken to mean on an MFN and National Treatment basis. In the fully competitive market in Australia, the rate at which*

> *interconnection is provided is determined by negotiation. Both negotiating parties have recourse to an independent arbitrator which will make a decision based on transparent criteria to ensure that rates are fair and reasonable in the circumstances.*

Part IIIA, in contrast with Part XIC, may not allow declaration of relevant services as required by the Fourth Protocol. For example, sub-section 44G(3) of the TPA provides that access "would promote competition in at least one market (whether or not in Australia) other than the market for the service." This does not accord with the commitments in the Fourth Protocol, which make it clear that competition need only be promoted in the market for that service.

Secondly, Part IIIA does not provide for non-discriminatory, cost-based pricing. Section 44X does require the ACCC to take into account the direct costs of providing access to the service (among other things), which does suggest cost-based pricing. But it does not provide for non-discriminatory pricing.

Indeed, Part XIC could, and should, be improved by introducing a provision for non-discriminatory pricing, to ensure that Australia's interconnection regime accords with the Fourth Protocol.

In general terms, however, there is a marked lack of any access pricing principles under Part IIIA, which is inimical to the development of a fair and transparent regulatory approach. In contrast, the ACCC has already developed a detailed set of pricing principles[43] under Part XIC. These provide a relative degree of certainty about the pricing approach to be applied.

Finally, Part IIIA does not provide for any general conditions of interconnection, such as standard access obligations, which are implicitly required by section 2 of the reference paper in the Fourth Protocol. Section 152AR fulfils the requirements of this section.

Additional requirements

In addition, it is should be noted that subsection 2.4 of the Fourth Protocol headed "Transparency of Interconnection Arrangements" requires that a major supplier will make publicly available either its interconnection agreements or a reference interconnection offer. This rule may possibly require Australia to legislate to ensure that major carriers publish their interconnection agreements. Such an approach would have the effect of better informing the market of what prices need to be paid to guarantee feasible interconnection with the dominant network.

The ACCC has suggested that the ACCC impose reference prices for declared services, with which providers would have to comply when offering the service. Alternatively, an access provider could be compelled to give an access

[43] ACCC, *Access Pricing Principles*, July 1997.

undertakings.[44] If the undertaking is unacceptable or not given, the ACCC would then be able to draft its own undertaking. Such powers would better fulfil the transparency requirements in the Fourth Protocol.

Consequences of a failure to fulfil obligations

It appears that Australia would be in breach of its treaty obligations if it were to remove or dilute its regimes which safeguard competition and guarantee access in the telecommunications industry. Australia does have the right to withdraw from international agreements subject to it giving a specified notice period. However, in practice there is a great deal of political and commercial pressure placed on signatory states not to retract their international law obligations.

In the case of the Fourth Protocol, there is an effective enforcement mechanism through the WTO. Under the WTO, if a Member state believes that another Member state is in breach of its obligations under GATS (to name just one agreement) that Member state can complain to the Dispute Resolution Body ("**DSB**") of the WTO about that conduct. If the DSB upholds the complaint, it can authorise the complaining Member state to target industries of the offending state for tariffs and other kinds of retaliatory conduct. Therefore it is certainly plausible that if Australia were to repeal or significantly amend Parts XIB or Part XIC then Australia could well be in breach of its obligations under the GATS.

Australia would need to proceed carefully if it were to repeal or significantly amend Parts XIB and XIC. This is because dilution of these regimes may put Australia in breach of its obligations under the Fourth Protocol. As already mentioned, a Member state which is in breach of its obligations under either the Fourth Protocol, or the GATS itself, can be subject to retaliatory action by Member states whose citizens or businesses have been adversely affected by the first Member state's behaviour.

The United States in particular has adopted a very aggressive approach towards other states whom it regards as being in breach of WTO or other free trade obligations. The United States government is particularly concerned with the liberalisation of trade in services. Australia has already been subject to several complaints, including one lodged by the United States that concerned subsidies paid to a car upholstery manufacturer.[45] Australia received an adverse finding from the DSB, and that subsidy had to be withdrawn. There is a real possibility that Australia could face complaints from foreign governments (whether the United States or others) if it significantly dismantled regimes designed to protect and promote competition and interconnection in the telecommunications industry.

It should be noted that it is not simply private sector or government *conduct* that can be challenged under the GATS. Rather, actual *regulation* (or lack thereof) can form

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[44] ACCC Submission, August 2000, p. 92.

[45] Website reference: http://www.wto.org/english/tratop_e/dispu_e/1343d.doc: "Australia – Subsidies Provided to Producers and Exporters of Automotive Leather".

the basis of a valid complaint. For example, in the Foreign Sales Corporations case, the DSB found that provisions of the United States Internal Revenue Code that provided unfairly favourable tax treatment to certain corporations incorporated in external U.S. possessions were incompatible with the GATS.[46]

[46] Website reference: http://www.wto.org/english/tratop_e/dispu_e/108r.doc: "United States – Tax Treatment of Foreign Sales Corporations".

Competition in Telecommunications Markets under the Current Regulatory Regime in Australia

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1. Introduction

A primary objective of the current telecommunications-specific regulatory regime in Australia (the regulatory regime) is to promote competition in telecommunications and related markets.[1] The regime aims to achieve these objectives primarily by:

- establishing the rights of third parties to gain access to services which are necessary for competition in telecommunications and related markets; and
- controlling the use of market power that has the effect or likely effect of substantially lessening competition in telecommunications and related markets.

In June 2000, the Commonwealth Government asked the Productivity Commission to conduct an inquiry and review the regulatory regime having regard to, among other matters, the state of competition in telecommunications markets.

In its Issues Paper, the Productivity Commission noted:

> An important issue in evaluating whether telecommunications-specific competition regulation should be repealed or amended is the extent to which competition has developed in the telecommunications market or segments of that market (with these segments including different technologies, functions and geographical locations).[2]

The Productivity Commission also noted that the Inquiry:

> …goes beyond the experiences of the past few years to an assessment of the likely nature and extent of barriers to competition over the medium term, say the next two to seven years.[3]

[1] Part XIB of the *Trade Practices Act 1974* specifically addresses anti-competitive conduct in markets for carriage services, for goods and services used in conjunction with carriage services, and for access to facilities. Part XIC of the *Trade Practices Act 1974* aims to promote competition in markets for carriage services and for services supplied by means of carriage services.

[2] Productivity Commission, *Review of Telecommunications Specific Competition Regulation Issues Paper*, June, 2000 p.10.

[3] *ibid*, p.11

The aim of this paper is to analyse recent developments in competition in telecommunications markets in Australia, focussing on the role of the regulatory regime in promoting competition.

Ideally, one would like to quantify the effects the regulatory regime has had on competition. This would involve a comparison of the state of competition with and without the regime. To isolate the effects of the regulatory regime it would be necessary to identify the effects other factors, such as changes in technology, have had on the state of competition in telecommunications markets. The paucity of data combined with the short period of time the regulatory regime has been in place is likely to make such analysis inconclusive.

The aim of this paper is less ambitious. The aim is to identify the major artificial barriers to entry and competition in telecommunications markets and assess whether the regulatory regime provides a framework to address these barriers. The purpose is not to 'second-guess' the decisions made by the regulator, but rather to determine whether the regulatory framework is appropriately designed to address artificial barriers to entry and competition in telecommunications markets.

To date the major role of the regulatory regime has been to limit the 'spillover' effects barriers to entry into some market segments could potentially have had on competition in other segments. The high degree of vertical and horizontal integration and the prevalence of network effects in telecommunications markets provides the scope for providers with market power in particular market segments to use that power to create barriers to entry and competition in other market segments.

In considering whether the current regulatory regime is necessary or appropriate over the next two to seven years, it is therefore important to address two questions.

First, will there remain significant barriers to entry into segments of telecommunications markets and/or will new significant barriers to entry arise?

Second, will it be possible for barriers to entry into particular segments of telecommunications markets to 'spillover' and limit entry and competition in other market segments?

2. Competition in telecommunications markets

Competition is a process of rivalry among the providers of goods and services to attract new customers and to retain existing customers. Rivalry arises from the availability of alternatives. The availability of other providers gives consumers a choice of their source of supply. The availability of similar goods or services provides consumers with alternatives that can meet their demands.

The availability of alternatives constrains the power of any particular provider from profitably raising prices or lowering service quality. The availability of alternatives enables consumers to switch their custom to alternative suppliers or alternative services in response to such action.

The availability of alternatives also encourages providers to lower costs (and hence prices) and improve the range and quality of services they provide. In order to gain new customers and retain existing customers, providers must continually strive to offer more attractive services to consumers at a lower price. Providers that are successful in doing so increase their profits. Providers that are unsuccessful or fall behind lose customers and become unprofitable.

2.1. Competition and economic well-being

Competition is a device for allocating society's resources among competing uses. The economic value of competition, is that, in many circumstances, it encourages the allocation of resources that best promotes the economic well-being of society. That is, in many circumstances, competition will promote economic efficiency.

Economic efficiency has three elements: productive (or technical) efficiency, allocative efficiency and dynamic efficiency.

Productive efficiency

Productive efficiency concerns how efficiently resources are used in producing goods and services. Resources will be used more efficiently if:

- firms produce goods and services at least cost (in terms of resources consumed); and
- production activities are distributed across firms to minimise industry-wide costs (i.e. in the long term more efficient firms displace less efficient firms).

Allocative efficiency

Allocative efficiency concerns the allocation of resources among their competing (potential) uses. For example, if the same amount of resources can be used to produce one unit of each of two services, the resources should be allocated to the service that is of most value to consumers. In this way limited resources are allocated to the uses that have the greatest value to consumers.

Allocative efficiency is most often achieved if the prices of goods and services reflect the value of the next best alternative use of the resources (at the margin). This signals the cost (in terms of what is forgone) of using the resources to produce the good or service.

Dynamic efficiency

Dynamic efficiency concerns the efficient use of resources over time. Decisions to invest in capacity to provide services in the future (investment decisions) should be efficient, as should decisions to innovate and reduce costs over time. Dynamic efficiency also concerns timely changes in production processes and the types of goods and services firms produce in response to changes in technology, the tastes of consumers and production opportunities.

In most markets competition will promote economic efficiency.

As noted above, rivalry among firms encourages providers to lower costs, innovate and reduce costs over time. It also results in low cost providers displacing high cost providers over time. In this way competition promotes productive and dynamic efficiency.

By limiting prices to cost, competition encourages allocative efficiency. Prices in competitive markets usually reflect the value of resources used in the supply of the service (at the margin). This signals to consumers the cost of the service. Not only does this encourage the efficient use of resources today (allocative efficiency), but it also encourages efficient investment decisions (dynamic efficiency).

Importantly, for markets and competition to be fully effective in promoting economic efficiency, firms must be able to enter and compete based on their relative merits. This requires that there be no barriers to entry, and that once entered, a firm's success be based on their capability (relative to other firms in the market) to deliver the services demanded by consumers at a high quality and a low cost.

2.2. Forms of competition in telecommunications markets

There are circumstances where competition will not necessarily promote economic efficiency. For example, in some markets the costs of provision are such that it is economic for a single provider to serve the entire market.[4] As discussed below, this is or is likely to be the case for a number of market segments in telecommunications (such as regional segments).

Under these circumstances there may be little or no scope for an entrant to invest and enter to compete with an existing provider. This lack of incentive for entry is likely to persist even if prices are above competitive levels. Potential entrants would reasonably anticipate that the incumbent provider would reduce charges if a rival entered the market. Given post-entry prices rather than pre-entry prices determine whether entry is profitable, this prospect may prevent entry.

Indeed, not only is it unlikely that a new entrant could enter and successfully gain a foothold in such a market, but from a social perspective, it may be undesirable to encourage multiple providers, since this will lead to the costs of services increasing.

In such circumstances, the forces of competition may be bought to bear by competition *for the market* rather than competition *within the market*. Competition for the market and provision of services by a single provider can lead to prices for services which would be obtained if the market was openly competitive.[5][6]

In practice there are different types of market segments in telecommunications. At one end of the spectrum there are market segments where it is only economic for a single provider to enter. At the other end of the spectrum there are market segments where potentially a large number of providers may be economic. This is demonstrated by the large number of providers at the retail level of the internet market. In between there are market segments in which it is economic for only a few providers to enter. Across these different types of markets, the development of competition and the form of competition will differ, as will the strategies of market entrants. To analyse the state of competition in these market segments requires different models of competition to be applied.

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[4] This is often the case where there are large economies of scale in production.

[5] See Demsetz, H. (1968) "Why regulated utilities?", *Journal of Law and Economics*, 11.

[6] A possible limitation of competition for the market driving economic efficiency is the presence of significant sunk costs – where sunk costs are those incurred by an entrant which cannot be recovered if the provider subsequently withdrew from the market.

In market segments where it is economic for a single provider to serve the entire market, the only likely form of competition is competition *for the market*. It is unlikely that an entrant could contest such market segments without some formal mechanism to tender for the market. One such mechanism is the competitive tendering process being conducted by the Department of Communications, Information Technology and the Arts to provide untimed local calls and internet access in 'extended local call zones' in remote Australia.

In market segments where economic entry is unlimited, one would expect entry and competition on a range of scales. Some entrants will develop strategies to seek customers across the breadth of the market, while other entrants will seek niche parts of the market.

In market segments where it is economic for a few providers, entrants must gain a significant market share in order to be profitable. This is likely to delay entry and alter entry strategies. In such market segments entrants are likely to pursue strategies to reduce uncertainty before committing to large-scale investments in infrastructure. One strategy used in some market segments is to build up a customer base and gain market information through re-selling the services provided by the incumbent. Another strategy is to negotiate long-term contracts with major customers before making large-scale investments in infrastructure.

2.3. Levels of competition in telecommunications

Entry and competition also develops at different levels in telecommunications markets. Within the levels, the form of competition and the market structure are likely to differ significantly. In telecommunications markets, entry and competition tends to develop at two broad levels.

Retail level

Retail providers purchase end-to-end wholesale telecommunications services and re-sell them to retail consumers. Retail providers mainly add value to the wholesale service through customer care and billing services.

Wholesale level

In many telecommunications markets, providers of wholesale services can be separated into access-based providers and network-based providers.

Access-based providers provide services by combining some of their own network elements with services provided by a network-based provider. For example, access-based service providers of national long-distance telephony services combine originating and terminating access and long-distance transmission services with their own switching facilities to provide national long-distance services.[7]

Network-based providers provide telecommunications services by directly connecting consumers to their network. Network-based providers rely on other network providers for interconnection to ensure any-to-any connectivity.

There is a high degree of vertical integration across the retail and wholesale levels of telecommunications markets. In nearly all cases network-based and access-based providers compete directly in the provision of wholesale services and in the provision of retail services. Furthermore, access-based providers rely on network-based providers for necessary inputs into providing wholesale services. This can create tensions for network-based providers between providing access and promoting their competitive position in the market.

The entry strategies of individual providers differ and change over time. Some providers solely offer retail services. Some providers use access-based entry to build-up their customer base and knowledge of telecommunications markets and technologies before fully investing in network infrastructure. Some network-based providers use resale and access-based services to extend the geographic coverage of their network or the range of services they offer.

2.4. Economic characteristics of telecommunications networks

Before assessing the role of the regulatory regime in promoting competition, it is necessary to understand the important economic characteristics of telecommunications networks and telecommunications markets in Australia. These characteristics include:

- network effects;
- economies of scale;

[7] The network elements provided by access-based service providers may include some long-distance transmission.

- economies of scope;
- economies of density;
- sunk costs;
- vertical integration; and
- statutory incumbency.

These characteristics affect the development of competition in telecommunications markets and the market structure. They also affect the role regulation can play in altering the structure of the market to make it more competitive.

Network effects – The value to a consumer from joining a telecommunications network depends upon the other users that he/she can communicate with. These benefits are known as network effects.[8]

Economies of scale - Economies of scale occur where the average (or per unit) cost of providing a service decreases as the amount of the service provided increases. Economies of scale in telecommunications result from the high proportion of fixed costs in the total costs of providing telecommunications services. Fixed costs do not vary with the amount of the service provided. For example, a proportion of the costs of providing local calls on a fixed-line network are the costs of providing access lines to users. As these costs do not vary with the quantity of local calls provided to the user, the cost per call decreases with the amount of calls made. Economies of scale may make it uneconomic for more than one or a few providers to serve some market segments in telecommunications.

Economies of scope – Economies of scope in production occur where the cost of providing two services jointly is lower than the cost of providing the services separately. Economies of scope are ubiquitous in telecommunications networks and are largely driven by the high proportion of fixed costs that can be spread over a number of services. For example, there are economies of scope between Pay TV services and voice telephony as demonstrated by Cable and Wireless Optus' (C&W Optus) HFC network. There are also economies of scope between data and voice services.

[8] See Liebowitz, S. J. and S. E. Margolis (1994) "Network Externality: An Uncommon Tragedy", *Journal of Economic Perspectives*, Vol.8, No.2 for a description of network effects.

There are also economies of scope in consumption. It may be less costly for consumers to purchase a package of telecommunications services from one provider than individual services from different providers. Some consumers prefer to deal with one provider and receive a single bill for their telecommunications services. This spreads the costs of interacting with a single provider over a number of services.

Economies of density – Economies of density occur where the average cost of providing a service decreases the more closely consumers are clustered. Economies of density are particularly important in fixed-line networks where the costs of connecting customers to the network increases the more sparse is the population. Economies of density can generate significant differences in the costs of providing fixed-line telecommunications services across regions.

Sunk costs – Sunk assets have no alternative use once employed. As a result, the cost of these assets cannot be recovered if the service is discontinued – they are sunk costs. For example, the line connecting a customer to a fixed-line telecommunications network is a sunk cost once the investment is completed. The provider has no alternative use of the line if the customer discontinues the service.

Vertical integration – Vertical integration occurs where the same provider provides services throughout the production chain. For example, Telstra is fully vertically-integrated in the provision of national long-distance services. Telstra provides call origination and call termination services to access-based providers, wholesale services to retail providers and retail services to consumers.

Horizontal integration – Horizontal integration occurs where the same provider provides services across a number of telecommunications markets. For example, Telstra provides voice telephony, data services, the wholesale carriage of Pay TV services, and so on.

Statutory incumbency – Although not an economic characteristic of telecommunications networks or markets, it is important to recognise that until l991 Telstra (then Telecom) was a statutory monopoly in the provision of telecommunications network services. Following that period, there was a period of duopoly when Telstra and C&W Optus were the only licensed carriers of fixed-line telecommunications services. Telstra's initial market position was as a consequence of government restrictions on competition. The role and rationale of regulation may be different if that position had been attained via a competitive process.

2.5. Potential barriers to entry and competition in telecommunications

There are many definitions of barriers to entry. Most definitions are based on the advantages an incumbent has in a market over new entrants. For example, Baumol, Panzer and Willig define barriers to entry as:

> … anything that requires an expenditure by a new entrant into an industry, but imposes no equivalent costs on an incumbent.[9]

Similarly, Stigler defines a barrier to entry as:

> … a cost of producing (at some or every rate of output) which must be borne by a firm which seeks to enter an industry but is not borne by firms already in the industry.[10]

Barriers to entry and competition reduce the scope for providers to profitably enter or reduce the scope for providers once entered to compete based on their relative merits. Some barriers to entry are 'natural' barriers in the sense they are a consequence of the cost and demand characteristics of the market. Other barriers, such as licensing restrictions, are artificial.

Barriers to entry into some telecommunications markets are significant and partly explain the market structures observed in Australia today. Barriers to entry are also important in predicting where and how competition may develop and the role of regulation in affecting outcomes. There are three major barriers to entry into telecommunications markets.

Sunk costs

Sunk costs are a significant 'natural' barrier to entry into a number of telecommunications markets and market segments. A new entrant must factor a range of costs into its decision of whether it can profitably enter a market, including the costs of network infrastructure, product development, gaining market information, and so on. For the incumbent these costs have been sunk (i.e. they cannot be recovered if the incumbent decides to exit the market). Although prices may be high

[9] Baumol, W., Panzer, J., and Willig, R, *Contestable Markets and the Theory of Industrial Organisation*, Harcourt Brace Jovanovich, New York, 1982, p.282.

[10] Stigler, G. *The Theory of Price*, 1946, p.67.

today, the potential entrant is aware that these costs will not factor into the incumbent's decision-making post-entry. This increases the risk and uncertainty concerning profitability upon entry. As such sunk costs can be a barrier to entry.

Switching costs

Switching costs are the costs incurred by a customer when changing the provider of a service. For example, in the absence of number portability, a customer changing their network provider of local calls must incur the costs of changing their telephone number. A new entrant must offer better deals to customers by at least the amount the customer values their current telephone number. This is a cost that must be incurred by the entrant that is not incurred by the incumbent and hence is a barrier to entry and competition.

Regulation

Government regulations can also be a barrier to entry and competition. Restrictions on the licensing of carriers was, up until 1997, a significant barrier to entry and competition. The residual effects of those restrictions may still be playing a role in the state of competition in some markets today. Environmental and other restrictions affecting network roll-outs can also be a barrier to entry into some telecommunications markets, as can be the availability of radiocommunications spectrum.

3. Regulation and competition in telecommunications markets

3.1. Role of regulation in promoting competition

Regulation has two important roles in promoting competition in telecommunications and related markets.

First, regulation can remove **artificial** barriers to entry and competition or limit the scope for the incumbent to artificially raise such barriers.

Second, regulation can minimise the 'spillover' effects entry barriers into one market or market segment can have on competition in other telecommunications markets or market segments.

3.1.1. Artificial barriers to entry and competition

Regulation can promote competition by reducing artificial barriers to entry or preventing the incumbent from artificially raising barriers to entry. For instance, mandating the availability of local number portability can be seen as a way of reducing switching costs and hence a barrier to entry. An incumbent has little incentive to reduce this barrier to entry by agreeing to processes that allow for number portability.

It should be recognised that regulation aiming to address 'natural' barriers to entry can be counterproductive. If barriers to entry result from the cost and demand characteristics of the market (such as the existence of large sunk costs), regulation has no direct role in promoting competition. However, as discussed below, regulation can play an important role in limiting the scope for 'natural' barriers to entry to 'spillover' into other markets or market segments.

3.1.2. 'Spillover' effects of barriers to entry and competition

By the nature of telecommunications entry barriers in one market or market segment can potentially be used to restrict entry and competition in other markets or market

segments. The interrelationships between telecommunications markets provides scope for providers with market power in some market segments to use that power to create barriers to entry and competition in other market segments. Three characteristics of telecommunications are particularly important in this regard:

- horizontal integration;
- vertical integration; and
- network effects.

Horizontal integration

Horizontal integration is prevalent in telecommunications, primarily as a result of economies of scope in production and consumption. While horizontal integration can be efficient, it provides the scope for entry barriers into one market or market segment to 'spillover' into other markets or market segments.

For instance, Telstra provides local access services (the connection of customers to their local network) and national and international long-distance services. While there are barriers to entry into the provision of both local access services and national and international long-distance services, they are more pervasive in the former. There is scope for Telstra to extend the advantages it enjoys in the provision of local access services to the national and international long-distance markets.

One way in which this could occur is through the failure to provide preselection. Preselection enables users to select a provider of national and international long-distance services that is not the provider of their local access service without the need to dial an over-ride code. In the absence of preselection, the incumbent provider of local access services may have a competitive advantage over other providers in the provision of national and international long-distance call services. As a result, other providers may not be able to compete based on their relative merits. There is scope for the entry barriers into the local services (local access) market to be extended to the national and international long-distance markets. Regulation, by mandating preselection, has limited the scope for this to occur.

Vertical integration

Vertical integration can also create the scope for entry barriers to 'spillover' into other markets or market segments. For example, Telstra provides each of the services that make-up a national long-distance service. It provides call origination and termination, switching, long-distance transmission and customer care and billing. While barriers may prevent other providers from competing with Telstra in the provision of call origination and termination services, competition in the provision of the other services

is less restricted. However, if origination and termination services are not made available or is done so at inflated prices, entry into the other levels of the market will not occur. In this way entry barriers to providing call origination and termination services can extend to other levels of the market. Regulation can prevent the 'spillover' of these entry barriers.

Network effects

As noted above, the value to a user of connection to a telecommunications network depends upon the number and identity of the users he/she can communicate with. As a result, in the absence of interconnection, larger networks have an advantage over smaller networks in attracting subscribers. Network effects can create the scope for entry barriers into some market segments to 'spillover' to other market segments.

Consider fixed local networks. The scope for entry differs significantly across geographic areas. In many rural areas entry barriers are high and entry is unlikely. In some parts of CBD areas however, entry barriers are lower and entry has occurred. In the absence of interconnection between networks, barriers to entry in some geographic segments of the market could extend to other segments. Providers of fixed local networks in areas where entry is economic would be at a disadvantage in competing if its subscribers could not communicate with users in other regions. Regulation, by mandating interconnection, can limit the scope for barriers to entry into some regional segments of the local services market to 'spillover' into other regional segments.

3.2. Assessing the role of regulation in altering the state of competition in telecommunications markets

Assessing the role of the regulatory regime in altering the state of competition in telecommunications markets requires two questions to be addressed.

1. What is the current state of competition in the relevant markets?

2. What would have been the state of competition in the absence of the regulatory regime?

There are a number of difficulties in assessing the role of the regulatory regime in altering competition in telecommunications markets. First, the state of competition cannot be observed. Second, for many telecommunications markets, data on structure and outcomes are incomplete. Third, even if such information were complete, it is difficult to separate the effects of the regime in altering market structure and

outcomes from other changes, such as changes in technology. Finally, the full effects of regime on competition may take some to become evident. Comparisons of the state of competition today may be premature.

Inferring the state of competition

In many cases competitive behaviour is difficult to observe directly. As a result, the state of competition in a market is impossible to measure. Analysts often infer the state of competition from market structure. In general, the less concentrated the market structure, the more likely the market is competitive. The state of competition can also be inferred from market outcomes, such as the margins between prices and costs. However, there is no 'hard and fast' rule.

Data on market structures and outcomes

To assess how markets have changed under the regulatory regime requires accurate information on market structures and outcomes prior to the regime and again today. As discussed below, these data are more readily available for some telecommunications markets and market segments than others. In some markets changes occur at such a rapid pace that many measures of change are soon dated.

Identifying the role of the regulatory regime

A major difficulty in assessing the role of the regime is to separate the effects of the regime from other events that may have altered the state of competition in telecommunications markets. For example, the auctioning of radiocommunications spectrum may have a major effect on the state of competition in the market for mobile telecommunications services. Similarly, changes in technology that enable services to be provided on a commercial basis using different means of delivery may also play a role in the state of competition in some segments of the local services market.. Separating these effects from the role of the regulatory regime is a difficult task.

Full effects of the regime

The time taken for entrants to roll-out alternative services combined with consumer inertia means that market structure and the state of competition do not necessarily change immediately in response to changes in regulations. Basing an assessment of the success of the regulatory regime on the state of competition today is likely to provide an incomplete picture. Although the current regulatory regime in Australia is now more than three years old, many of the decisions made by the regulator have been made within the last 18 months. It is highly unlikely that the full implications of those decisions will be evident for some time.

3.3. Approach to assessing the role of the regulatory regime in altering the state of competition

As a result of the difficulties described above, it is not possible to expressly determine the role of the regime in altering the state of competition in telecommunications markets. All that is realistically possible is to analyse whether the evidence is consistent with the proposition that the regime has promoted competition and may be necessary in the future. This analysis will consist of three parts.

1. Identify the 'natural' and artificial barriers to entry and competition in telecommunications markets and market segments.

2. Review the decisions made under the current regulatory regime to determine how the regime may promote competition by addressing artificial barriers to entry.

3. Describe how competition has changed under the current regulatory regime by identifying changes in market structure and market outcomes.

4. Defining telecommunications markets

Markets are the fields within which competition between firms takes place. Defining markets is therefore an important part of determining whether conduct will lessen competition, or whether regulating access to particular services will promote competition. It is not possible to develop an 'all purpose' menu of telecommunications markets. From a regulatory viewpoint, the relevant market(s) and sub-market(s) should be defined with the regulatory question to be addressed clearly in mind. For instance, in assessing whether certain behaviour is anti-competitive it is necessary to start with the behaviour and define the markets within which the behaviour may have an effect.

Defining the limits of a market are extremely important in regulatory decisions. Defining a market too narrowly may result in the pro-competitive effects of regulation being overestimated and create a tendency for regulation where it is not justified. On the other hand, defining a market too broadly may result in the pro-competitive effects of regulation being underestimated and create a tendency for not regulating where it is justified. In determining the limits of the market, it is therefore necessary to consider each of the dimensions of the market thoroughly.

Product dimension

The product dimension of the market identifies alternatives in the demand for, and supply of, the service. Given the rapid pace of technological change and the growing demand for innovative telecommunications services, the product dimensions of telecommunications markets are unlikely to be static. For example, as wireless technologies develop they may become more and more substitutable for fixed-line networks. This may broaden the scope of some telecommunications markets. Alternatively, developments in xDSL technologies allowing higher speed data services using copper wire networks may create new markets or market segments.

Functional dimension

Vertical activities within a production chain are in the same functional market if it is more economic for a single provider (compared to more than one provider) to provide the activities. If there are substantial efficiencies to be gained from vertical integration, then the vertically-integrated provider will be able to outperform two independent non-integrated providers. The field of competition will embrace the activities within the vertical chain.

The functional dimensions of the market are particularly important in assessing whether declaration of services under Part XIC of the *Trade Practices Act 1974* will promote competition in telecommunications markets. If there are significant

efficiencies in jointly providing the access service and dependent services, declaration may do little to promote competition.

Geographic dimension

The geographic dimension of a market determines the area within which products or services are, or potentially could be, supplied.

Important to defining the geographic dimensions of the market are the business strategies employed by providers. For example, providers may engage in nationally consistent business practices which means it would be misleading to focus attention on a specific region. In other words, if providers are operating nationally it may be more appropriate to consider strategies in (regional) 'sub-markets' (or market segments) as one element of a broader national strategy.

Time dimension

Defining markets requires examining a sufficiently long period of time to allow competition to develop. For example, Brunt argues that:

> Competition is a process rather than a situation. Dynamic processes of substitution are at work (p.96).[11]

Adopting a long run dynamic view of competition is particularly important in telecommunications where rapid technological advancements can quickly alter the scope of the market and the state of competition.

Brunt further notes:

> … effective competition is fully compatible with the existence of strictly "limited monopolies" resting upon some short run advantage or upon distinctive characteristics of product (including location) Where there is effective competition, it is the on-going substitution process that ensures that any achievement of market power will be transitory. (p.96)[12]

Taking a long-term view of the market does not however imply that anti-competitive conduct over a short period of time cannot have long-term effects. The network

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[11] Brunt, M. (1990)), " 'Market Definition' Issues in Australian and New Zealand Trade Practices Litigation," *Australian Business Law Review*, Vol. 18, No. 2, p.94.

[12] *ibid*

effects inherent in many telecommunications markets can turn short-run advantages into long-term effects. This may increase the need for quick regulatory action if the short-run advantage is the consequences of taking advantage of market power.

Assessing competition in telecommunications markets

For the purposes of identifying barriers to entry and competition in telecommunications markets and assessing the effects the regulatory regime may have on competition, it is necessary to take a pragmatic view of market definition. The approach adopted in this paper is to divide telecommunications services into groups with similar features (in the eyes of users). This forms the basis of a more detailed assessment of the various dimensions of the market.

From a user's perspective there appears to be two major distinguishing feature of telecommunications services. The first is whether the service is provided to or from a fixed location or can be provided independently of the user's location. The second is the type of information the service can convey. This could range from voice to video services. These distinctions provide an initial separation between fixed and mobile telecommunications services and voice and data services.

Furthermore, the scope for entry and the way competition has developed differs between local, national long-distance and international call services. This indicates a further separation giving the following six broad groupings of telecommunications services:

- local access and local calls (local services);
- national long-distance services;
- international services;
- mobile services;
- internet services; and
- data services.

It is not claimed that these services form separate markets. Nor is it claimed that there are not separate markets within these classifications. Rather they are classifications upon which to commence assessing the role of the regime in promoting competition.

5. Local access and local calls (local services)

Local access is the connection of a customer in a fixed location to a network. Local calls are calls between parties at fixed locations within the same local call area.[13] The *Telecommunications Act 1997* requires that carriage service providers offering local calls offer an untimed local call option. The majority of local calls are charged on that basis.

5.1. Scope of the market

Product dimension

The main alternative to local services are mobile services. The distinguishing feature of mobile services is the capability for the user to make and receive calls irrespective of their location. There is some evidence that some consumers consider mobile services as a substitute for local services.[14] However, at this time, it appears that mobile services are not a sufficient viable alternative (at the margin) to include fixed and mobile services in the same market.[15]

The majority of local services are provided by fixed-line technology. Developments in wireless technology and the increasing availability of necessary spectrum has seen some providers developing more localised wireless alternatives to fixed-line local services. For example, Hutchison Telecommunications recently launched a wireless product Orange One which enables customers to use the same phone while at home (or place of business) and when they leave home (or place of business). Currently, this service is only available in some areas of Melbourne and Sydney. Over time, wireless-based local services may become a viable alternative to fixed-line local services.

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[13] In Australia, the definition of local calls and the distinction between local and national long-distance calls is largely a legacy of Telstra's charging system and government legislation.

[14] For example, OFTEL, in a recent survey of households without a fixed phone, found the main reason for not having a fixed phone was a preference for mobiles. Fifty per cent of consumers living in a home without a fixed phone used mobile phones instead.

[15] It is difficult to predict the extent to which mobile and fixed services will become substitutable over the next two to seven years. This will depend upon a range of factors including improvements in wireless technology.

Functional dimensions

There appear to be two functional levels of the market for local services, a wholesale level and a retail level. The wholesale level comprises local network providers that directly connect customers to their network and provide local calls over that network. This involves interconnecting with other networks to ensure local calls can be completed.

At the retail level, providers purchase local access and an end-to-end local call service from a local network provider (local call resale). The provider combines the wholesale service with its own billing and customer care services to provide retail services to customers.

There is a high degree of vertical integration between the wholesale and retail levels of the local services market. The largest local network provider Telstra, provides about 90 per cent of its local services directly to retail customers.

Geographic dimension

There are a large number of geographic segments of the local services market. The characteristics of geographic areas differ by the number, density and demands of customers. This alters the scope for entry and competition at the wholesale level. In some areas, such as CBD areas, it may be economic for a number of network-based providers to enter and compete. In many rural areas of Australia, it may only be economic for one network provider to serve the entire market segment.

5.2. Wholesale competition in local services

To understand the development of wholesale (network) competition in the provision of local services and how competition may develop in the future, it is necessary to recognise there is not one 'typical' market segment for local services. The costs of providing wholesale local services and the revenues that can be achieved differ significantly across geographic areas.

Estimates by the ACCC of the costs of the lines connecting users to the Telstra's Public Switched Telephone Network (PSTN) are shown in Table 1. They indicate line costs differ significantly across broad regional classifications. For example, the costs per line in rural and remote areas are on average three times the costs per line in CBD areas. The differences are likely to be larger between more detailed regional classifications and between users within classifications.

There are a number of reasons for the differences in local network costs across regions. The more densely clustered are a group of users (or the larger are the economies of density), the lower the cost per user of providing wholesale local services. This appears to be a significant driver of the higher local network costs in regional areas.[16] Offsetting this are the higher costs of constructing networks in built-up areas. For example, the costs of access to ducts and trenches and the costs of laying cable are higher in CBD areas than in rural areas.

Table 1: ACCC estimates of efficient PSTN line costs: by region ($ per year)

	Efficient line costs 1999-2000	**Efficient line costs 2000-01**
CBD	152	156
Metropolitan	339	348
Provincial	302	310
Rural/remote	461	473
National average	336	346

Source: ACCC, *A report on the assessment of Telstra's undertaking for the Domestic PSTN Originating and Terminating Access services*, July 2000. These costs are the costs of the lines connecting users to Telstra's PSTN. They do not include the cost of providing services such as dial tone over the lines.

Current local network technologies allow network providers to offer more than voice services to users. Other services such as data and pay TV services can, in some cases, be provided using the same platform. For example, wireless technologies are capable of providing data as well as voice services. Optical fibre can provide voice, data and Pay TV services. The commercial feasibility of deploying alternative local networks and the technology employed depends upon the revenues from each of the services that can be provided using the platform. It is likely that the revenues from data and Pay TV services, rather than local services, will drive the commercial feasibility of alternative local networks in the future.

Controls on Telstra's retail prices for local calls and local access also affect revenues and the profitability of local services, especially across regions. Two parts of the price control regime are particularly important in this regard. First, recent limits on

[16] See Productivity Commission, "Population Distribution and Telecommunication Costs", *Staff Research Paper*, August 200 for some recent evidence of the economies of line density in Australia.

the rate of increase of Telstra's line access charges appear to have resulted in a deficit between the cost of lines and the revenues from line access charges in some areas. The ACCC recently estimated this difference to be in the vicinity of $1.2 billion.[17] As a consequence of this deficit, customers that make a low volume of calls can be unprofitable. Second, under Telstra's current price control arrangements, reductions in the prices of local calls in metropolitan areas must be passed on to customers in non-metropolitan areas. This restricts revenues and the profitability of providing local services in some areas.

Finally, the requirement under the *Telecommunications Act 1997* for providers of local calls to offer untimed calls can affect the profitability of providing local services. Telstra has indicated the holding time of a local call has increased significantly in recent times, largely as a consequence of the growing use of the internet.[18] This is particularly the case for residential users. To the extent the costs of providing local calls increase with call holding time, the requirement to provide untimed local calls may reduce the profitability of local services in areas with a high proportion of residential users.

These and other factors may make it uneconomic for more than one provider to provide wholesale local services in some market segments. In other market segments a number of wholesale providers may be economic. As result, the model of competition relevant to different market segments is likely to differ.

Even within regions or areas the density of users and their demands differ. As a result, alternative local network providers tend to target their roll-outs within areas – that is they do not duplicate the local loop for the entire region. For instance, even though in some CBD areas there are two or three local network providers, only a proportion of users within each district are passed by more than one network provider.

Another factor affecting how wholesale competition in local services may develop are the cost characteristics of alternative technologies. Both fixed-line and wireless technologies tend to be less costly on a per user basis in more densely populated areas. Nevertheless, there are some important differences. Fixed-line networks tend to have larger up-front roll-out costs, where wireless networks can be built-up more gradually. This enables wireless technology to target smaller groups of users. Furthermore, the costs of wireless networks are driven by access to sites, while fixed-

[17] ACCC. *A report on the assessment of Telstra's undertaking for the Domestic PSTN Originating and Terminating Access services*, July 2000

[18] See Sidak, G, J. *A Report to the Minister for Communications, the Information Economy and the Arts on the State of Competition in Australian Telecommunications Services One Year after Deregulation*, 1998.

line networks depend upon access to ducts and trenches, making one technology more suited to some areas than others.

Consistent with what has been observed to date, entry and competition is more likely to occur in market segments where there is a high proportion of high volume customers, where there is significant demand for jointly supplied products (such as high speed data services) and where the population is densely clustered. In these market segments, entry is likely to be more profitable without the need for the entrant to gain a major portion of the market. As a result, competition for some users within these segments is likely to develop.

In other market segments, entrants need to gain a major market share, or in some cases the entire market, to be profitable. The form of competition to develop in these segments is likely to be closer to competition for the market. Given the barriers to entry (see below), the strategies in these market segments will differ and competition may take some time to develop.

5.2.1. Barriers to entry

There are a number of barrier to entry into the provision of wholesale local services.

Sunk costs - Alternative local networks require large investments that are largely sunk once undertaken. For example, AAPT is predicted to invest over $100 million in constructing fibre networks in six major cities.[19] There are also a range of other significant sunk costs in network planning, market research, marketing, etc.

Switching costs – The costs to customers of switching between network providers can be a barrier to entry and competition. Even if an alternative network provider can provide a local service at a lower cost, consumers may be unwilling to change their provider. For some consumers, the cost of changing telephone numbers is a significant switching cost. In the absence of number portability, competition between local network providers may be weakened.

Regulations – Changes in the immunities of carriers under the *Telecommunications Act 1997* may have also increase barriers to entry into some market segments. To provide local services to business users new entrants require access to buildings. This

[19] Paul Budde Communications, *Carriers and Service Providers Australia 1999/2000*.

may now require significant building access fees, imposing costs on new entrants not incurred by the incumbent.

5.2.2. Regulatory decisions

A number of decisions have been made under the regulatory regime that may alter the barriers to entry and competition in the provision of wholesale local services.

Licensing – As noted above, until 1997 only two fixed-line telephony licences were issued. This prevented other providers from competing in the provision of wholesale local services. The move to open competition and the removal of the restrictions on carrier licenses removed a potentially major barrier to entry in the provision of wholesale local services.

Local number portability – Local number portability has been mandated under the regulatory regime. Local network providers must ensure consumers are able to retain their telephone number when changing their local network provider. Local number portability has been available to customers moving between Telstra and C&W Optus since May 1998. As noted by the Australian Communications Authority (ACA), more than 82,000 local services were ported during 1998-99. Most of these were between March 1999 and June 1999.[20]

Local number portability reduces the cost to customers of changing their local network provider and as such reduces the advantage the incumbent local network provider has over new entrants.

Local originating and terminating access – In July 1999, the ACCC declared under Part XIC of the *Trade Practices Act 1974* an access service involving the carriage of calls between customer premises equipment and a point of interconnection at or associated with a local switch. This service allows access seekers to provide local call services without directly connecting the user to their local network (i.e. to become an access-based local call provider). The access seeker provides switching and inter-switch transmission. To the extent this type of entry is commercially viable[21], the

[20] Australian Communications Authority, *Telecommunications Performance Report 1998-1999*.

[21] It seems unlikely that this form of entry is commercially viable. In order to become an access-based provider of local calls a provider must establish a large number of points of presence. This is extremely costly. As noted above, entry into the wholesale local service market is more likely if made in conjunction with Pay TV and/or data services. Currently, an access-based local call provider is not able to combine local calls with these services.

declaration prevents the 'spillover' of entry barriers into the provision of local access into the access-based provision of local call services.

More importantly, declaring originating and terminating access creates an obligation for interconnection between competing local networks and provides the scope for the regulator to be called upon in a dispute over the price of interconnection. Given it is likely that only one provider of wholesale local services is likely in many regional market segments and there are significant barriers to entrants contesting these segments, there may be scope for the provider in these segments to disadvantage competitors in the provision of wholesale local services in segments where entry is economic. By failing to interconnect or doing so at an inflated price, the incumbent can gain a competitive advantage over alternative local network providers. In the absence of interconnection, barriers to entry into regional segments of the wholesale local services market can 'spillover' into regional segments where the entry of alternative local network providers is economic.

5.2.3. State of competition

As result of its statutory monopoly, Telstra was the only local network provider until 1991. This monopoly was relaxed in 1991 with the licensing of C&W Optus as the second fixed-line network operator. In the mid-1990s C&W Optus rolled-out a HFC network capable of providing local services and Pay TV services. In 1997, restrictions on the number of fixed-line network licences was removed. Since that time new entrants have rolled-out local networks with limited reach in CBD and some regional centres.

C & W Optus

C&W Optus' HFC network passes about 2.2 million households in Australia (about 25 per cent of total households). The HFC network provides both Pay TV and local call services. Much of this was rolled-out by C&W Optus prior to the current regulatory regime, although C&W Optus has only recently been providing local services on a significant scale. Relative to Telstra, C&W Optus has only a small proportion of the Australia-wide local services market. Figure 1 shows that C&W Optus have between 3 and 4 per cent of the local services market. As a proportion of the total households passed by C&W Optus, its penetration is more significant reaching 14 per cent by March 2000 (as shown in Figure 2). Furthermore, connections to C&W Optus' network are growing at a rapid rate. Between March 1999 and March 2000, C&W Optus' local service customers increased by over 200 per cent.

Other providers

A number of other providers are also in the process of deploying or trialing local networks. For example, ACTEW is trialing a fibre network in Canberra that is capable of providing voice telephony, high speed data services and video services (including Pay TV). The Bass Coast Shire Council (in the South Gippsland region of Victoria) is trialing a wireless local loop network capable of providing local voice and data services.

A number of other providers, including AAPT and Powertel, are in the process of deploying fibre networks in CBD areas to provide voice telephony and high speed data services predominately to business consumers. Given the recent deployment of these networks, one would not expect these providers to have built up a significant customer base at this stage.

5.2.4. Assessment of the state of network competition

Currently, C&W Optus' local network passes 25 per cent of households in Australia. Other providers are developing local networks that will pass a small proportion of businesses and households. Although there has been some entry into the provision of wholesale local services under the regulatory regime, the most significant entry occurred prior to the regime commencing.

Competition has built-up slowly on a limited basis. Different technologies are being used depending on the characteristics of the areas and the demands of users within the area. Many users whose demands are limited or who are in areas where the costs of network deployment are high have no choice of their local network provider, nor is it likely they will do so in the foreseeable future. These users fall into one of a number of categories.

First, as noted above even where there are alternative network providers, entry has in some cases has been targeted. Some users in areas where there are alternative local network providers are not passed by the alternative local network.

Second, a number of households are located in USO areas. In these areas the costs of providing wholesale local services exceed the revenues (exclusive of the universal

service payment). The ACA estimated that in 1998/99 Telstra's loss from meeting their universal service obligations was in the vicinity of $280 million.[22]

To the extent entry is economic in parts of these areas, the entrant must gain an extremely large market share (and hence a large proportion of the USO subsidy). A formal mechanism has been proposed whereby local network providers could compete to be the universal service provider in particular zones within USO areas. Until such a mechanism is in place, it is unlikely any consumers in USO areas will have a choice of their local network provider.

[22] Australian Communications Authority, *Universal Service Assessment 1998-99*.

Figure 1: C&W Optus Local Service Revenue - from Directly Connected Customers (end of March)

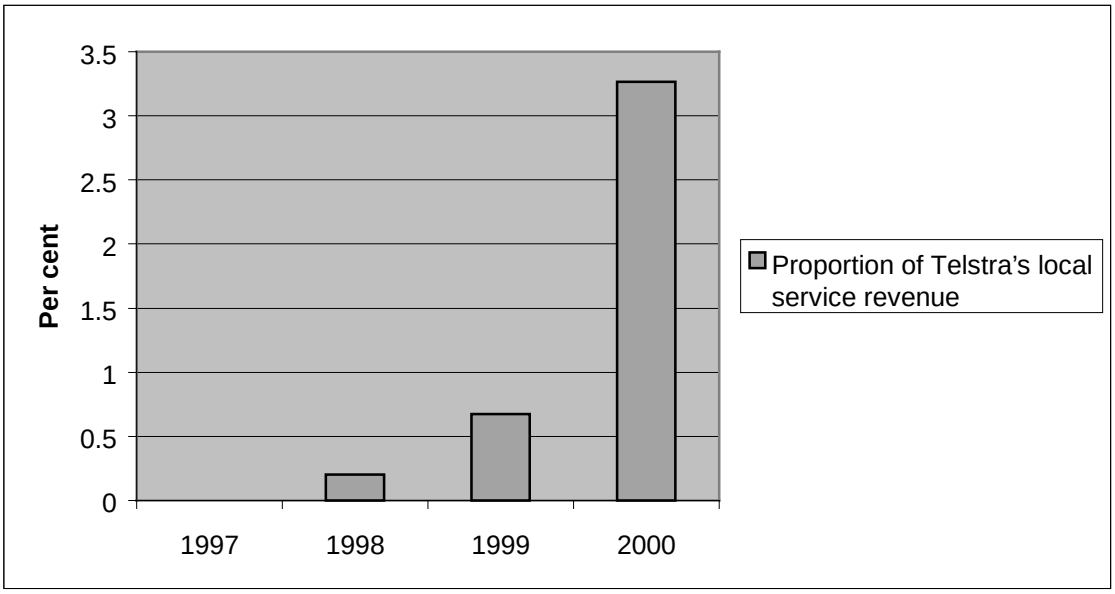
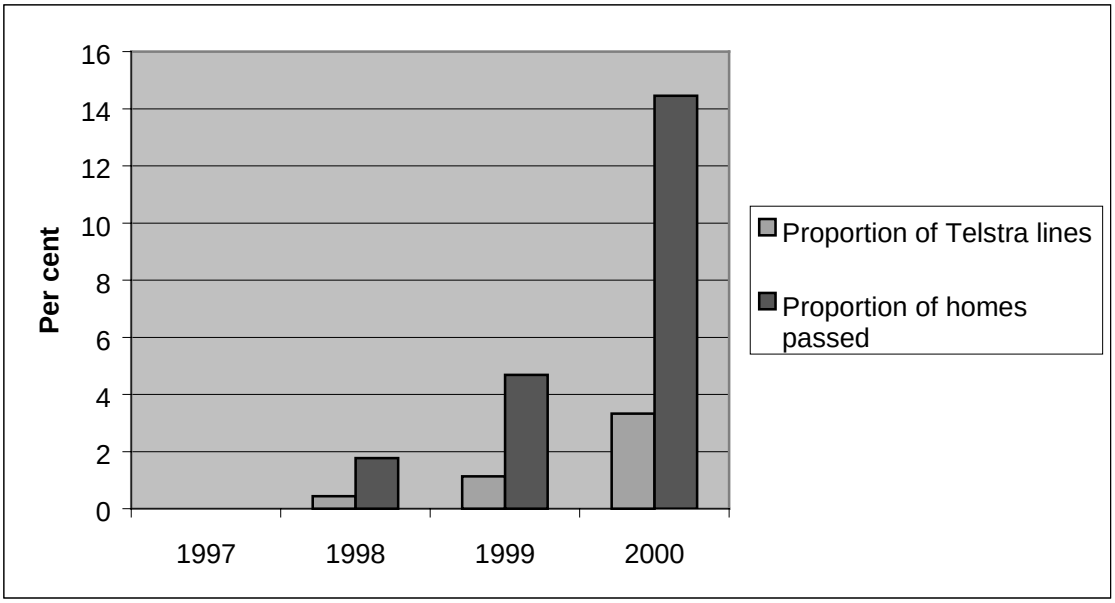


Figure 2: C&W Optus Local Network Customers and Lines (end of March)



Third, there are areas where local network services are profitable, but it is only commercially feasible for a single provider to serve the entire market segment. While competition for such segments is theoretically feasible, the high level of sunk costs and the absence of a formal tendering scheme make entry highly improbable. It is difficult to determine the proportion of users located in these areas. This would require detailed modelling of the costs and revenues of providing telecommunications services on a regional basis.

Fourth, there are areas where entry by a local network provider is economic, however, in order to be commercially feasible the entrant must gain a large market share. Given the large and sunk nature of the costs involved in such entry and the large losses that may be incurred in the event of failure, entry into these market segments is likely to take some time and involve entrants implementing a range of strategies to reduce the risks involved.

One such strategy is demand aggregation. This involves major users of telecommunications services within a region aggregating their business in order to encourage an alternative local network provider. This provides the entrant with some certainty of demand prior to entry and reduces the risk of the incumbent under-cutting the price of the entrant.

Such strategies are time-consuming and difficult. It is not surprising that in the three years of since the commencement of the regime entry into these market segments has been limited.

5.3. Retail competition in local services

Retail competition in local services has developed under the regulatory regime largely as a result of entry and competition into the provision of national and international long-distance services. As some consumers prefer to purchase a package of telecommunications services from one provider, providers of national and international long-distance services have become retail providers of local calls in order to provide packaged services.

Table 2 below indicates that currently about 10 per cent of Telstra's revenues from local calls are earned through the provision of wholesale services and about 8 per cent from basic access. The increase over the last 12 months reflects the growing demand for wholesale local services by providers offering packages of telecommunications services to consumers.

Table 2: Telstra's local service revenue

	Revenue $m				Per cent wholesale			
	96/97	**97/98**	**98/99**	**99/00**	**96/97**	**97/98**	**98/99**	**99/00**
Basic access	1,740	1,770	1,885	2,020	7	5	5	8
Local calls	2,664	2,664	2,727	2,650	10	6	6	10
Total	4,404	4,434	4,612	4,670				

Source: Telstra Corporation Limited , *Annual Results*, various years.

Entry barriers

Entry barriers into the provision of retail local services are small when compared to wholesale local services. The investment costs of setting up a local call resale business are small. At various times over the last decade there have been a large number of providers of local call resale based on the margins between Telstra's retail local call prices. For example, during the mid-1990s Telstra offered discounted local call prices to business customers. This created an arbitrage opportunity for providers to re-sell these calls to residential users. This arbitrage opportunity disappeared when the discounts were limited to business lines. This partly explains the decrease in the wholesale proportion of Telstra's local service revenues between 1996/97 and 1997/98 (see Table 2).

Probably the only significant barrier to entry into the provision of retail local services are switching costs. Telstra charges a churn fee for the process of transferring customers between itself and retail local call providers and between the providers themselves. In order to be competitive in the provision of local call services, the retail provider must be more efficient than the incumbent by the amount of the fee (as well as any costs of inconvenience the transfer process causes the customer). As these costs are not incurred by the current provider of local call services, it is a potential barrier to entry and competition.

Regulatory decisions

The major regulatory action affecting the cost of switching between retail providers of local services was the ACCC's decision to issue competition notices to Telstra under Part XIB of the *Trade Practices Act 1974*. These notices were based on the ACCC's concerns that Telstra's churn process was slow, inefficient, cumbersome and costly. In the absence of regulatory interventions there appears to be little incentive for Telstra to design an efficient process and to charge a cost-based price. To the extent that ACCC's concerns were the case, Telstra's actions may have artificially raised

switching costs and a barrier to entry and competition in the provision of retail local services.

5.4. Market Outcomes

Prices of local calls

Competitive pressures on local call prices have come from two sources. First, from the growing competition from C&W Optus as an alternative local network services provider. C&W Optus entered the market offering untimed local calls at 20 cents. This compares to Telstra's standard local call price at the time of 25 cents. Second, from retail providers of local calls. For example, One-Tel has being offering untimed local calls for 17.5 cents.

For many years Telstra offered a standard local call rate of 25 cents.[23] As shown in Table 3, Telstra's average retail local call charge decreased by one cent over the last 12 months. This has been the result of the introduction of neighbourhood local calls and the reduction of the standard price of local calls.

Table 3: Telstra's Average Retail Local Call Charge (cents per call)

1997/98	1998/99	1999/2000
23.9	24.4	23.3

Source: Telstra Corporation Limited, *Annual Results*, various years. The averages are based on Telstra's local call revenues and number of local calls. The revenues include retail and wholesale revenues. An adjustment has been made to take account of the increase in wholesale revenues between 1998/99 and 1999/00.

Prices of basic access

Prices of basic access have remained largely unchanged over most of the period the regulatory regime has been in place. C&W Optus offered the same residential basic access charges as Telstra on entering the market. C&W Optus' business basic access charges was lower.

[23] Note that as a result of inflation and increasing holding times, this price in real terms has been falling.

The major development in basic access charges has been the re-balancing of charges by Telstra through offering packages of higher basic access charges and lower call charges.[24]

5.5. Conclusions

There are significant 'natural' barriers to entry into the wholesale local services market. Sunk costs are large. It appears that in many regional market segments it is uneconomic for more than one network provider to service the market. Entry into those market segments will raise the costs of provision. In some other segments entry is commercially feasible only if the alternative provider can gain a substantial market share.

It is not surprising therefore that currently around three-quarters of businesses and households in Australia do not have a choice of their network provider of local services. The extent to which this will change over the next two to seven years is uncertain. Entry is likely to be driven by developments in the demand for services other than local services that are provided using local networks, such as data and Pay TV services. Developments in technology may reduce the up-front costs of network roll-outs allowing network providers to target the more profitable users within some regions. The possibility of the tendering parts of the USO may provide further opportunities for wholesale competition in local services. It is likely however that over the next two to seven years a large number of consumers of local services will remain uncontestable.

From the decisions of the regulator to date, the current regulatory regime seems to provide a process for addressing artificial barriers to entry into the wholesale local services market. Probably more importantly, the regulatory regime seems capable of limiting the scope for 'natural' barriers to entry into some segments of the wholesale local services market to 'spillover' into other market segments. This is likely to be particularly important in the future in promoting competition in contestable segments of the market.

[24] For example, under Telstra's EasySaver Plus package, the price of local calls is reduced to 18.7 cents (from 22 cents) and local access rental is increased to $17.60 per month (from $15.24 per month).

6. National long-distance and fixed-to-mobile services

As noted previously, in analysing barriers to entry and competition in fixed telephony services it seems sensible to distinguish between local and long-distance services. The barriers to entry and how competition has developed in the provision of long-distance services differ significantly to local services.

It also seems sensible to consider fixed-to-mobile calls in conjunction with national long-distance services. Fixed-to-mobile calls and national and international long-distance calls are currently part of a single preselection basket. If a customer preselects a provider for his/her national long-distance calls, the same provider is preselected to provide the customer's fixed-to-mobile calls. As a result, barriers to entry that may limit competition in the provision of one of these services may also affect competition in the provision of the other service.

6.1. Dimensions of the market

Product dimension

As with local calls, the main alternative for consumers to national long-distance and fixed-to-mobile calls are mobile calls. At this time, it does not appear changes in the prices of mobile services will result in large changes in the demand for national long-distance services. for most consumers, it appears that mobile services are not a viable alternative given differences in price and quality. Analysis by the ACCC suggests that the prices of a national long-distance call from a mobile phone can be up to 75 per cent greater than the price of an equivalent call from a fixed phone.[25] Over time this may however change. For example, some mobile to mobile calls are already cheaper than fixed-to-mobile calls.[26]

Different technologies can be used to provide components of national long-distance and fixed-to-mobile calls. As noted above, although fixed-line technologies dominate local fixed networks, wireless networks are becoming a viable substitute for some

[25] Australian Competition and Consumer Commission, *Competition for long distance mobile communications, A report about declaration of a long distance mobile origination service*, January 2000

[26] For example, Telstra, C&W Optus and Vodafone offers free mobile calls during certain times of the day so long as the call is between mobile users on their own network.

customers in some areas. Similarly, although long-distance transmission is dominated by cable links, it can also be provided by microwave and satellite.

Functional dimensions

There are five components of national long-distance and fixed-to-mobile calls:

- call origination (carriage of the calls by a local network provider from the A-party to a switch);
- switching;
- long-distance transmission of the call;
- call termination (carriage of the calls from a switch to the B-party); and
- customer care and billing.

Although there are some economies of scope between some of the components of national long-distance and fixed-to-mobile calls, it appears from market behaviour that competition can occur within two functional levels of the market.

Retail level

Retail providers purchase end-to-end national long-distance and fixed-to-mobile calls from network-based or access-based providers and combine these with billing and customer care services to provide retail call services to consumers. Many retail providers package national long-distance calls and fixed-to-mobile calls with other telecommunications services.

Wholesale level

The wholesale level comprises network-based providers and access-based providers.

Network-based providers provide end-to-end national long-distance and fixed-to-mobile calls by connecting customers to their own local network. In terms of national long-distance calls, providers such as Telstra provide call origination, switching, long-distance transmission and in most cases call termination.[27] For fixed-to-mobile calls,

[27] In some cases, a network provider will have to purchase a terminating access service from another network provider.

network providers require mobile network providers to terminate the calls. In this case, the mobile provider will provide the long-distance transmission of the calls (if required) and termination services on their mobile network.

For national long-distance calls, access-based providers purchase call origination and termination services from local network providers and combine that with switching and long-distance transmission services to provide an end-to-end national long-distance service.[28] For fixed-to-mobile calls, access-based providers purchase call origination from the local network provider and call termination from the mobile network provider and combine that with switching to provide an end-to-end fixed-to-mobile call.

There is a high degree of vertical integration in the provision of national long-distance and fixed-to-mobile calls. Telstra for instance has the largest shares of the wholesale and retail segments of the market. Furthermore, in most cases, access-based providers must purchase services such as call origination and call termination from their competitors.

Geographic dimension

The market appears to be a national market. A number of access-based providers have national coverage. Furthermore, the business strategies of recent entrants do not appear to be regionally-based. For example, C&W Optus charges the same prices for national long-distance and fixed-to-mobile calls independently of the location of the calling party or the location of the party being called.

6.2. Competition in national long-distance and fixed-to-mobile services

The major driver of increased competition in the provision of national long-distance and fixed-to-mobile calls has been access-based competition. It is in this area that regulation has played the greatest role in reducing barriers to entry and promoting competition.

[28] In many cases the provider purchases wholesale long-distance transmission services from other providers, including network providers.

6.2.1. Barriers to entry to access-based competition

Although small compared to wholesale competition in local services, there are nevertheless some potentially important barriers to access-based entry into the provision of national long-distance and fixed-to-mobile calls.

Sunk costs – Although the investment to become an access-based provider on a national scale is large, it appears that this is not sufficient to deter entry and competition. Some of the costs incurred in entry are not sunk. For example, in some cases switching equipment can be sold or used for other purposes if the provider decides to exit the market.

It should be noted however, that sunk costs do play a role in the time taken for entrants to build-up a national presence. The costs of establishing points of interconnection or points of presence and developing brand recognition are sunk once incurred. These costs grow as the provider increases its geographic coverage. The importance of points of presence in all regions seems to be diminishing over time however. As a providers, such as AAPT, roll-out national coverage, other providers have an option for a third party to carry calls to and from a wide number of geographic locations.

Switching costs – The costs to customers of switching between providers of national long-distance and fixed-to-mobile calls can be a barrier to competition and entry. Some customers may be unwilling to incur the costs and inconvenience of dialling an over-ride code in order to change their provider of national long-distance services. Potentially this could provide network-based providers with a competitive advantage over access-based providers. These switching costs have been significantly reduced by the availability of preselection.

Barriers to entry from other markets – Probably most important is the potential for barriers to entry in other markets or market segments to distort access-based competition in the provision of national long-distance and fixed-to-mobile calls.

As noted above, there is a large degree of vertical integration among providers of national long-distance and fixed-to-mobile calls. Telstra for instance is the major fixed and mobile network provider and the major provider of wholesale long-distance transmission services. Telstra also provides the largest share of national long-distance and fixed-to-mobile calls. C&W Optus is a major mobile network provider and as shown above, is beginning to build up its share in the wholesale local services market. C&W Optus is also a major provider of national long-distance services. This integration increases the scope for barriers to entry in the wholesale local services market, and to a lesser extent in the mobile services market, to distort competition in the provision of national long-distance and fixed-to-mobile calls.

For example, as noted above originating and terminating services are necessary inputs into the provision of national long-distance services. As also mentioned above, it is uneconomic for more than one or a few provides to offer local network services in many market segments. Certainly it is uneconomic for each provider of national long-distance services to duplicate the local loop. Given the vertical integration of providers of national long-distance services, there is scope for a local network provider to favour its own operations by inflating the price of originating and terminating access to its competitors. A provider of mobile network services may similarly be able to inflate the price of terminating access to favour its own operations in the provision of fixed-to-mobile calls.[29]

6.2.2. Regulatory decisions

A number of decisions under the regulatory regime have been made to promote competition in the provision of wholesale national long-distance and fixed-to-mobile services. The issue is whether they address barriers to entry and competition.

Domestic PSTN originating and terminating access – Domestic PSTN originating and terminating access were deemed to be declared services under Part XIC of the *Trade Practices Act* in 1997.[30]

Declaration of these services prevent entry barriers into the wholesale local services market to 'spillover' into the provision of national long-distance and fixed-to-mobile calls. As noted above, network-based providers offering national long-distance and fixed-to-mobile calls may have an incentive to inhibit access to call origination and termination services or provide the services at an inflated price to gain an advantage over other providers. This may create a barrier to entry and distort competition in the provision of national long-distance and fixed-to-mobile calls. Declaration, by creating an obligation to provide call origination and termination services, and by providing the scope for regulatory intervention in the determination of prices, reduces the scope for any market power in the provision of wholesale local services to limit

[29] It should be noted that some of the returns to the mobile telephony provider of doing so will be dissipated by competition for customers in the mobile telephony market. The higher are fixed-to-mobile termination charges the more competition there will be for mobile subscribers. Alternatively, lower fixed-to-mobile termination charges are likely to result in higher prices for mobile telephony services.

[30] Australian Competition and Consumer Commission, *Deeming Statement of Telecommunications Services*, 30 June 1997.

and distort competition in the provision of national long-distance and fixed-to-mobile calls.

Since the commencement of the regime, the ACCC has publicly examined Telstra's proposed charges for domestic PSTN originating and terminating access. The ACCC has concluded that Telstra's initial and subsequent proposed charges are too high (the first by over 100 per cent). While these findings by the ACCC have likely placed downward pressure on these charges, it is difficult to observe how actual charges negotiated between the parties have changed.

Long-distance transmission services – Long-distance transmission services carry national long-distance calls between switching centres in major cities and population centres. The ACCC deemed to be declared long-distance transmission services (except those between capital cities) in 1997. Since that time, the ACCC declared long-distance transmission between capital cities, except between Melbourne-Canberra-Sydney.[31]

Investment in long-distance transmission links involves large sunk costs. Once investment has been undertaken, the costs cannot be recovered on exit. Furthermore, given large economies of scale in the provision of long-distance transmission, it may be uneconomic for more than one provider to provide links between some cities or major population centres. It certainly is not economic for each provider of national long-distance services to provide these links.

Given the vertical integration of some national long-distance providers, declaration of transmission services limits the extent to which barriers to entry (in the provision of long-distance transmission) can 'spillover' into the provision of national long-distance services.

Domestic GSM terminating access – Domestic GSM terminating access was deemed to be a declared service under Part XIC of the *Trade Practices Act* in 1997.[32] Similar to domestic PSTN originating and terminating access, declaration of mobile terminating access reduces the scope for barriers to entry into mobile services to 'spillover' into the provision of fixed-to-mobile calls. Although the scope is more limited than for PSTN originating and termination access[33], there is a possibility that

[31] Australian Competition and Consumer Commission, *Transmission Capacity Service, Discussion paper*, June 2000.

[32] Australian Competition and Consumer Commission, *Deeming Statement of Telecommunications Services*, 30 June 1997.

[33] The reason it is more limited is that there is greater scope for the current terminating provider to be by-passed.

vertically-integrated providers of fixed-to-mobile termination services (such as Telstra and C&W Optus) could inflate fixed-to-mobile termination charges in order to disadvantage its competitors in the provision of fixed-to-mobile services.[34] This could discourage efficient competition in the provision of fixed-to-mobile services.

Local call resale – In July 1999, the ACCC declared a local carriage service obligating local network providers to supply wholesale end-to-end local call services.

The declaration of local call resale can potentially limit the extent to which barriers to entry into the wholesale local services market can 'spillover' into the provision of national long-distance and fixed-to-mobile services. To the extent there are economies of scope in consumption of local services and national long-distance and fixed-to-mobile services, providers offering packages of services may have a competitive advantage over those that do not. Given the significant barriers to entry into the provision of wholesale local services, horizontally-integrated providers, such as Telstra, may potentially be able to use any market power in the provision of wholesale local services to create a barrier to entry and competition in the provision of national long-distance and fixed-to-mobile services.

Commercial churn – As noted above, toward the end of 1998, the ACCC issued competition notices to Telstra under Part XIB of the Trade Practices Act 1974 based on the ACCC's concerns that Telstra's commercial churn process was slow, inefficient, cumbersome and costly. Telstra charges the provider receiving the customer for transferring customers from itself and between retail providers of local services. Providers of packages of local and long-distance and fixed-to-mobile calls must be at least this much more efficient than the current provider in order to provide a competitive packaged service. Given the significant barriers to entry into the wholesale local services market, horizontally-integrated providers may have little incentive to develop an efficient churn process. In this way horizontally-integrated providers can potentially gain a competitive advantage in the provision of national long-distance and fixed-to-mobile calls. In this case, Part XIB provided a mechanism to limit the extent to which barriers to entry into wholesale local services could potentially 'spillover' into competition into the provision of national long-distance and fixed-to-mobile calls.

[34] The scope for Telstra or C&W Optus to do this is limited by their market share of mobile services.

6.2.3. State of competition in the provision of national long-distance and fixed-to-mobile calls

There has been significant entry into the provision of national long-distance services. This entry has occurred both prior to the regulatory regime and after its introduction. Prior to 1997, there were only two licensed carriers, Telstra and C&W Optus. Telstra provided national long-distance services as a network-based provider. C&W Optus was an access-based provider providing switching, some long-distance transmission and customer care and billing. C&W Optus' market share grew between 1993 and 1996 during the preselection ballot. C&W Optus acquired a 13 per cent share of preselected customers Australia-wide. A number of more limited access-based providers, such as AAPT, were also providing national long-distance services. As these providers were not licensed carriers, they were limited in the infrastructure they could employ which placed them at a disadvantage when negotiating charges for services such as call origination and call termination.

Since the commencement of the current regime the more recent entrants have increased their shares of national long-distance revenues at the expense of Telstra and C&W Optus.

Competition in the provision of fixed-to-mobile calls was extremely limited until the inclusion of fixed-to-mobile calls in the preselection basket in 1999. The shift of customers at that time to their preselected national and international long-distance provider has shifted shares of fixed-to-mobile calls from Telstra to other providers.

These trends are displayed in Table 4. Table 4 details the national long-distance and fixed-to-mobile call revenues for the major providers Telstra, C&W Optus and AAPT. These providers currently have over 95 per cent of national long-distance and fixed-to-mobile call revenues. Telstra's share of revenue decreased between 1999 and 2000. This coincides with the inclusion of fixed-to-mobile calls in the preselection basket. The increase in Telstra's share between 1998 and 1999 is primarily driven by the growth in fixed-to-mobile revenue over that period. Over the same period Telstra's share of national long-distance decreased significantly.[35]

Table 4: National long-distance and fixed-to-mobile call revenues $m (per cent of total revenue)

[35] Telstra Corporation Limited, *Public Submission to the Productivity Commission Inquiry into Telecommunications Specific Competition Regulation*, 30 August 2000.

	1998	1999	2000
Telstra	2598 **(82%)**	2775 **(84%)**	2626 **(81%)**
fixed-to-fixed	*1508 (47%)*	*1486 (45%)*	*1406 (43%)*
fixed-to-mobile	*1090 (34%)*	*1289 (39%)*	*1220 (38%)*
Cable & Wireless Optus	462 **(14%)**	354 **(11%)**	350 **(11%)**
AAPT	140 **(4%)**	163 **(5%)**	274 **(8%)**
Total	3200 **(100%)**	3292 **(100%)**	3250 **(100%)**

6.2.4. Market outcomes

Measuring market outcomes for national long-distance and fixed-to-mobile calls is a difficult task. Price comparisons in particular are fraught with a number of difficulties.

First, providers of national long-distance and fixed-to-mobile calls often have different menus of charges differing by the time the call is made, the distance between the calling parties and the duration of the call. Further, the menu of offerings have changed significantly over time. For example up until 1999, Telstra charged a set fee for each chargeable period (or part thereof) for fixed-to-mobile calls. In 1999 however, Telstra altered its charging structure to a flagfall plus a usage charge. For price comparisons to be accurate they must capture both the changes in unit prices, as well as changes in the menus of offerings available to consumers.

Second, comparisons must capture the offerings by all the major providers of the services. Relying solely on the prices offered by the incumbent provider can potentially provide misleading results. As incumbents have a significant market share they must trade-off losses in market share against the loss in revenues from their existing customer base when deciding whether to lower prices. New entrants do not face this trade-off.

Third, comparisons over time must incorporate changes in market shares. Even if prices do not change over time, changes in the market shares of providers will reduce the average price paid for national long-distance and fixed-to-mobile services.

Price comparisons

Although no price comparison provides a full picture some tentative conclusions can be drawn from the studies recently completed by the Communications Research Unit (CRU) from the Department of Communications, Information Technology and the Arts for the ACCC and the Productivity Commission.

The study by CRU is based on the national long-distance prices offered by both Telstra and C&W Optus and tracks price changes over the period 1995 to 1999. The Productivity Commission study is based on Telstra's prices and track prices between 1998 and 1999.

As shown in Figure 3, CRU estimate that national long-distance prices have fallen by around 37 per cent in real terms between 1995 and 1999.[36] This equates to a real decline in prices of around 9.5 per cent per annum. The decline in prices has occurred before and after the introduction of the regime.

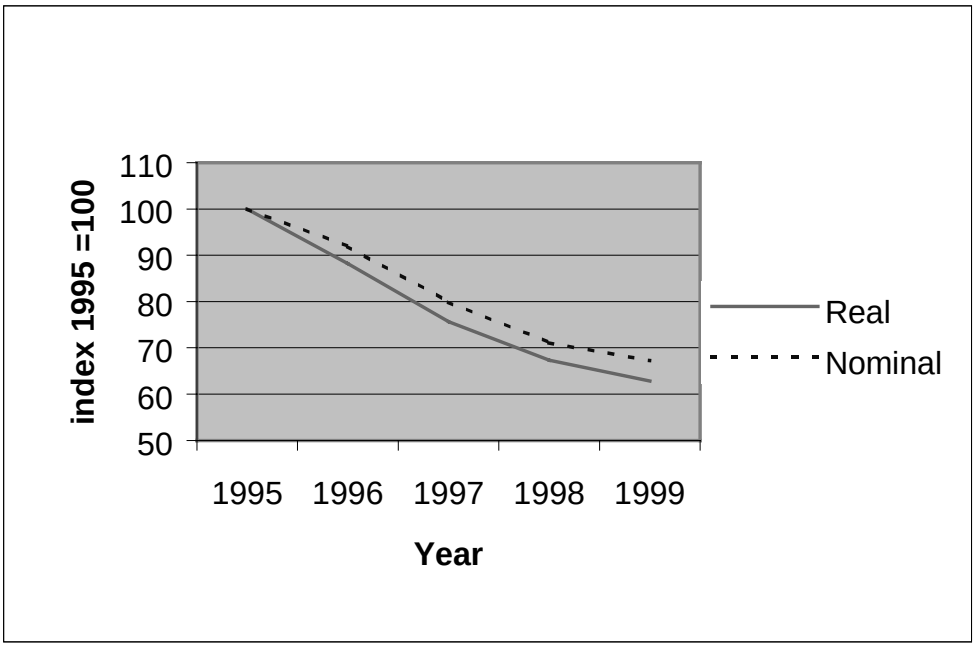
The Productivity Commission found that Telstra's national long-distance prices fell by 9 per cent in real terms between February 1998 and June 1999.[37]

It is unlikely that either of these studies capture the full effects increases in competition have had on the prices of national long-distance calls paid by consumers. As shown in Table 4, a major change in the national long-distance market has been the increase in market shares of recent entrants. In order to get a complete picture of the changes in national long-distance prices the effects of this entry must be fully captured. This only can be done by including the prices of new entrants into the price comparisons.

Figure 3: Index of national long-distance prices – 1995 to 1999

[36] Australian Competition and Consumer Commission, *Telecommunications Charges in Australia*, April 2000.

[37] Productivity Commission *International Benchmarking of Telecommunications Prices and Price Changes*, December 1999.



Source: Australian Competition and Consumer Commission *Telecommunications Charges in Australia*, April 2000

In terms of fixed-to-mobile calls prices, the trends have been less impressive. The CRU have estimated that:

- Telstra's fixed-to-mobile call charges decreased in real terms by on average about 11 per cent between 1995 and 1997 (about 3 per cent per annum); and

- C&W Optus' fixed-to-mobile call prices remained steady in real terms over the period 1997 to 1999.

This may partially reflect the lack of competitive pressure in the provision of fixed-to-mobile calls until 1999.

6.3. Conclusions

The entry barriers and development of competition in the provision of national long-distance and fixed-to-mobile calls differ significantly to those of wholesale local services. Unlike wholesale local services, competition has developed significantly.

Two aspects of competition in the provision of wholesale national long-distance and fixed-to-mobile services are important.

First, unlike wholesale local services, the cost characteristics are such that it is economic for a number of providers to enter and compete. There appears to be scope for a number of national providers with points of presence in all major population centres. Other providers have entered on a more limited basis concentrating on the larger population centres.

Second, the 'natural' barriers to entry into the provision of national long-distance and fixed-to-mobile calls are not large. Sunk costs do not appear to be an impediment to entry, nor do switching costs.

As a result significant entry has occurred and will likely continue to occur. This does not necessarily imply however that there is not a role for the current regulatory regime over the next two to seven years. The primary focus of the regime to date has been to limit the scope for barriers to entry into the wholesale local services market to 'spillover' into the provision of national long-distance and fixed-to mobile calls. The scope for these barriers to entry to distort competition in the provision of national long-distance and fixed-to-mobile calls will remain so long as:

- the barriers to entry into the wholesale local services market do not dissipate; and

- there is a high degree of integration (either vertical or horizontal) between the providers of wholesale local services and national long-distance and fixed-to-mobile services.

7. International services

International fixed calls are fixed or fixed-to-mobile calls that originate in Australia and terminate in another country. As discussed below, some of the barriers to entry into the provision of international calls are similar to those in the provision of national long-distance and fixed-to-mobile calls. However, given the characteristics of the market, they tend to less significant. As businesses and households with a high demand for international call services are highly concentrated, entrants have been able to gain significant market shares with targeted network roll-outs.

7.1. Dimensions of the market

Product dimension

As for other fixed services, mobile services is a potential alternative to international call services. However, currently price differences do not make mobile services a viable alternative for international call services for many consumers. For instance, the ACCC recently found that, for a small sample of international calls, prices from a mobile phone were up to four times higher than from a fixed phone. At the margin therefore, it appears that changes in the prices of international mobile calls are not a viable substitute for international fixed calls. Another possible alternative is international calls via the internet. At this stage it appears that quality differences limit the scope for internet calls to be a viable alternative to international calls for many consumers.

Different technologies can be used to provide components of international call services. As noted above, although fixed-line technologies dominate local fixed networks, wireless networks are becoming a viable substitute for some customers in some areas. Similarly international transmission can be provided by both cable and satellite.

Functional dimensions

There are five components of an international call:

- call origination (carriage of the calls by a local network provider from the A-party to a switch);
- switching;

- international transmission of the call;
- call termination (in the country of destination); and
- customer care and billing.

There are two functional levels of the market for international calls.

Retail level

At the retail level, providers purchase end-to-end international call services from network-based or access-based providers and combine this service with billing and customer care services to provide retail international call services to consumers. Given language and cultural differences across immigrant groups, some retail providers have been able to build up large numbers of retail customers by developing customer services to meet specific needs. This has been assisted by the clustering of migrants within cities in Australia.

Wholesale level

The wholesale level comprises network-based providers and access-based providers.

Network-based providers, such as Telstra, provide international long-distance services by connecting customers to their own local network. Telstra and other network-based providers are also members of consortia owning submarine cables connecting Australia to other countries. Network-based providers must negotiate agreements with carriers in the country of destination to terminate calls or arrange for a third party with such agreements to terminate the calls.

Access-based providers purchase call origination from local network providers and combine that with switching, international transmission and termination services in the country of destination. Some access-based providers, such as AAPT, have become members of consortia to build international cables. Others lease capacity on these cables.

Geographic dimension

The international call services market appears to be a national market. A number of access-based providers have national coverage. Furthermore, the business strategies of Telstra, the largest provider of international call services do not differentiate by region. Telstra's standard prices for international calls are the same independent of the location of the calling party in Australia.

7.2. Competition in international call services

The major drivers of increases in competition in the provision of international call services has been access-based entry at the wholesale level and retail competition. There appear to be few barriers to entry into the retail level. The investment costs tend to be low and entry and exit appear to be occurring on a regular basis. Although there are some barriers to access-based entry at the wholesale level, they appear to be diminishing over time.

7.2.1. Barriers to access-based entry at the wholesale level

The barriers to access-based entry into the international call services market are similar to those in the provision of national long-distance and fixed-to-mobile calls. The major potential barriers to entry and competition are 'spillovers' from the barriers to entry into the wholesale local services market. Given the high degree of integration between the providers of wholesale local services and international call services, there is potential for local network providers to distort entry and competition in the international call services market. Specifically, local network providers could favour their own operations by inhibiting access to call origination services or inflating the price of these services. Declaration of domestic originating access under Part XIC limits the extent to which there is scope for this to occur.

There are potentially two other barriers to providing access-based international call services.

First, there is the cost of terminating calls in the country of destination. Entrants must either negotiate agreements with carriers in the country of destination to terminate the calls or reach agreements with other carriers who already have reached these agreements. Although the costs of reaching agreements with carriers in other countries are sunk costs, they can readily be avoided through using third parties. A global market for the termination of international calls has developed mitigating the need for the sunk costs to be incurred.

Second, there is the cost of international cable and/or satellite links to carry the traffic to the country of destination. Access-based providers have two options. One is to lease capacity on existing cables (and satellites). The other is to become a member of consortia to deploy international cables. The first approach involves lower costs.

However, until recent times access to capacity was difficult. Investments in new cable capacity are likely to remove any barrier to entry in this regard.[38]

7.2.2. State of competition in the international call services market

There has been significant entry into the international call services market. The geographic concentration of many of the major business and residential customers has allowed a number of access-based providers to build-up their market share with limited network roll-outs.

Table 5 provides estimates of the shares of the international call services market between 1997 and 2000. Care must be taken in interpreting these shares as they were compiled from different sources. Nevertheless, it appears that since 1997 new entrants have gained market share mainly at the expense of Telstra. To draw firm conclusions however, requires more certainty over the data.

Table 5: Market shares- international long-distance

	1997 (Tom Pullar-Strecker)	**1998 (Merrill Lynch)**	**2000 (J.B. Were & Son)**
Telstra	70%	60%	48%
Cable & Wireless Optus	16%	23%	18%
AAPT	(incl. in other)	6%	6%
One-Tel	(incl. in other)	(incl. in other)	5%
Others	14%	11%	23%

Data Sources: ***1997*** – Tom Pulllar-Strecker, Telstra Shapes Up for Competition. *Comm. Int'n*, June 1997 as quoted in Sidak *op.cit.* ***1998*** - Merrill Lynch & Co. Telstra Corporation In-depth report, December 1998. ***2000*** - JB Were & Son as quoted by the ACCC in *A report on the assessment of Telstra's undertaking for the Domestic PSTN Originating and Terminating Access services*, July 2000.

[38] See Productivity Commission *International Telecommunications Regulation, Inquiry Report*, August 1999.

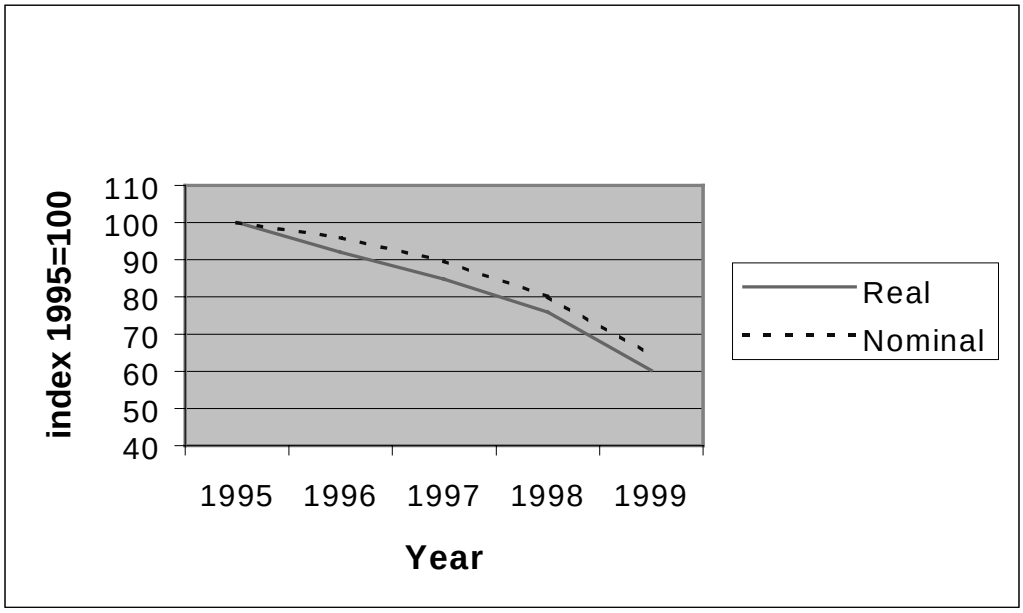
7.2.3. Market outcomes

As with national long-distance and fixed-to-mobile calls, the studies by the Communications Research Unit for the ACCC and the Productivity Commission provide the most accurate picture of changes in international call prices over time. CRU examined the changes in Telstra's and C&W Optus' retail international calls prices over the period 1995 to 1999. The prices cover calls made to 25 countries representing 80 per cent of international call revenue.

As shown in Figure 4, CRU estimate that international call prices have fallen by around 40 per cent in real terms between 1995 and 1999. This equates to a real decline in prices of around 10.5 per cent per annum. The decline in prices has occurred before and after the current regulatory regime commenced. The Productivity Commission has found that Telstra's residential international call prices fell by 56 per cent in real terms between February 1998 and June 1999. This finding is consistent with the finding by CRU that Telstra made significant reductions to its international call charges in 1999.

The major shortcoming of these comparisons is the failure to incorporate the prices of new entrants. Given the large increase in their shares of the international call services market, new entrants are likely to have driven much of recent price declines. Not including them in the comparisons is likely to result in an underestimate of the price declines experienced by consumers.

Figure 4: Index of international call prices 1995 to 1999



Australian Competition and Consumer Commission, *Telecommunications Charges in Australia*, April 2000

7.3. Conclusions

'Natural' entry barriers into the international call services market do not appear to be significant. Significant entry has, and is occurring, at both the retail and wholesale levels of the market. At the retail level a number entrants have been able to build-up market share by targeting the specific needs of particular groups (such as migrants).

Although the 'natural' barriers to entry are potentially higher at the wholesale level, they have not appeared to limit the scope for entry and competition. Sunk costs at the wholesale level do not appear to be significant, especially given the scope for entrants to gain access to a large proportion of the market with investment in a few population centres. To the extent that the costs to customers of switching between providers could have been a barrier to entry and competition, they have been reduced by the availability of preselection. As a result, significant entry has occurred resulting in large changes in market shares.

This does not imply that regulation has not played a role in promoting competition in the international call services market, nor does it imply that regulatory oversight is not necessary in the future. Given the high degree of integration between the wholesale local services market and the international call services market, there is the prospect that barriers to entry into segments of the wholesale local services market will

'spillover' and distort competition in the provision of international calls. The scope for this to occur is addressed under the current regulatory regime by the declaration of call origination services. So long as there are significant segments of the wholesale local services market that are not contestable, the scope for competition in the provision of international call services to be distorted will remain.

8. Mobile services

Mobile telecommunications services encompass calls from mobile phones to either fixed or other mobile phones.[39] The market for mobile services is large and growing. By the end of 1998 there were over 6 million subscribers generating nearly $4 billion in revenues.

8.1. Dimensions of the market

Product dimension

For consumers, the main alternative to mobile services are fixed services. Unlike fixed services, mobile services allows users to access the network anywhere there is coverage.[40] As a result, fixed services are not a close substitute for mobile services.

There appear to be no supply-side substitutes for mobile services. Given the distinguishing feature of mobile services is the ability of users to make or receive calls largely independent of their location, there is little scope for providers without access to necessary spectrum to enter the market.

Functional dimensions

There are two functional levels of the mobile services market, a wholesale level and a retail level. There is a high degree of vertical integration.

Wholesale level

Network-based providers, such as Telstra, C&W Optus and Vodafone, provide mobile services using capacity on their own mobile networks. All three providers have national coverage. Mobile network providers interconnect with fixed and other mobile network providers to ensure any-to-any connectivity.

[39] As a result, mobile telephony market does not include fixed-to-mobile calls.

[40] All that is required is that the user be within the geographic coverage of their mobile network, or other network providers offering roaming to the user's home network.

Using spectrum acquired at the recent spectrum auctions, One-Tel, AAPT and Hutchinson have, or are about to, launch national mobile services by combining their own network roll-out with roaming onto established network providers where they do not have coverage.

Retail level

Retail providers purchase end-to-end mobile services and combine these services with billing and customer care services to provide retail services to consumers. For example, AAPT currently re-sells mobile services provided by Vodafone and Hutchison re-sells mobile services provided by Telstra.

Geographic dimension

It appears that the mobile services market is a national market. Evidence indicates that geographic coverage is a major part of the value of subscribing to a mobile service. Even if users are unlikely to use their mobile phone in outlying areas, many value the certainty that coverage is available if required. As a result, even though some new providers such as One.Tel may focus on providing localised mobile services, geographic coverage is part of the package. It appears therefore that the mobile services market is a national market.

8.2. Competition in mobile services

Most of the value-added in mobile services are provided at the wholesale level. It is also the level where there are the largest barriers to entry.

8.2.1. Barriers to network-based entry to competition at the wholesale level

Spectrum

The major barrier to entry into mobile services is the availability of spectrum (or radio frequencies). The use of spectrum is regulated under the *Radiocommunications Act 1992*. Mobile network providers require licenses to use spectrum within specified frequencies and within specified geographic areas.

The spectrum available to a network-based provider affects the geographic coverage of the network, the capacity of the network (in terms of the number of calls the network can carry at any one time) and the types of services that can be provided (for example data services).

Sunk costs

In addition to acquiring spectrum, deploying a mobile network involves significant costs. The network provider must acquire and deploy base stations and other radiocommunications infrastructure. It must acquire switches and lines to link the switches and the base stations. Some of these costs can be recovered if the network provider decides to exit the market. Other costs, such as the costs of locating base stations and deploying radiocommunications infrastructure, are largely sunk once incurred.

It is difficult to determine the size of the sunk costs in investments in mobile networks and the extent to which they are a barrier to entry. It appears that mobile network providers can reduce the risks associated with sunk costs by developing their networks incrementally and roaming onto other mobile networks.

Switching costs

The costs to customers of switching between providers of mobile services can potentially be a barrier to entry and competition. In the absence of mobile number portability, new entrants must better the price of an incumbent by at least as much as the costs to the subscriber of changing numbers. This may be a small barrier given the high rates of churn experienced by mobile network providers and the growing number of new customers (including customers of pre-paid services).

Environmental regulations

In recent times restrictions in locating and constructing mobile network facilities have become more onerous. This increases the cost of new mobile network providers of constructing and establishing mobile networks. Many of these costs are sunk once incurred. As these restrictions have only recently been tightened, some of these costs were not incurred by the existing mobile network providers.

Further, as locating sites becomes more difficult, either because of environmental restrictions or because the more appropriate sites have been taken (and there is no prospect of sharing), more stations and receivers need to be installed to obtain coverage. This increases the costs of entering the mobile services market.

Entry barriers from other markets

Mobile network providers must acquire call termination services from local network providers in order to provide mobile-to-fixed calls. Given the major provider of wholesale local services also provides mobile services, there is scope for the provider to inhibit access to or inflate the price of call termination in order to obtain a competitive advantage in the mobile services market.

8.2.2. Regulatory decisions

Allocation of spectrum

The major change under the current regulatory regime has been the auction of the spectrum licenses. During the period until full deregulation in 1997, the Commonwealth government allocated spectrum to Telstra, C&W Optus and Vodafone. Since full deregulation, the Commonwealth has held a series of auctions to allocate previously unallocated spectrum, as well as some spectrum that has been made available from the gradual closing down of Telstra's AMPS network.

Through the auctions, spectrum has been allocated to the three incumbent mobile network providers and to new providers including Hutchison, One.Tel and AAPT. Further spectrum will also soon be auctioned. The spectrum auctions removed the major barrier to entry for some providers.[41]

Mobile number portability

In 1999, the ACCC directed the ACA to mandate the provision of mobile number portability. The ACA has mandated that all Australian mobile network providers make available mobile number portability by 25 September 2001.

To the extent that users of mobile services incur costs and inconvenience when changing their mobile telephone number, the availability of mobile number portability can potentially reduce a barrier to entry and competition.

Facility access

[41] The availability of spectrum still remains an insurmountable barrier to entry for those providers who have not been allocated spectrum.

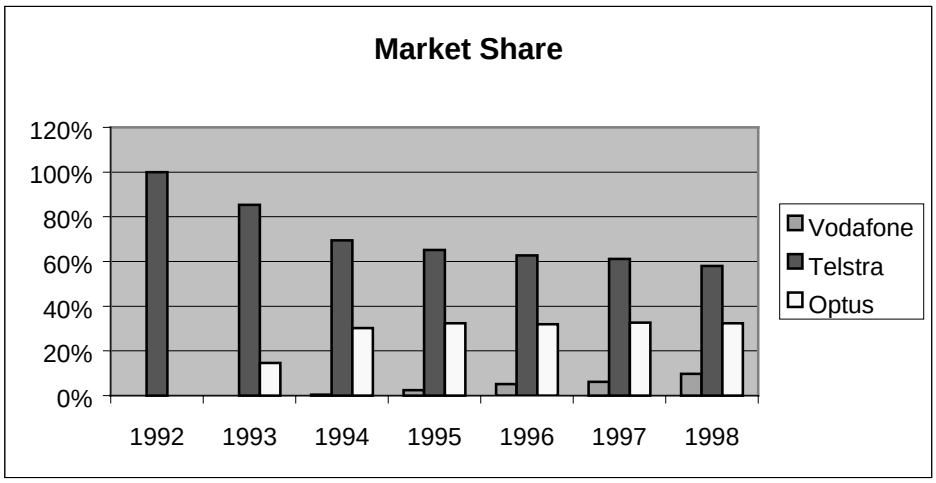
The *Telecommunications Act 1997* creates a facilities access regime obligating network providers to allow access to infrastructure such as site towers, transmission towers and underground facilities. To the extent environmental regulations and the use of less appropriate sites create a barrier to entry and competition, the requirement for facilities access reduces the barrier.

Domestic PSTN terminating access – As noted above there is scope for barriers to entry into the wholesale local services market to 'spillover' into the mobile services market. Declaration of call termination under Part XIC reduces the scope for this to occur.

8.2.3. State of competition in the mobile services market

The state of competition and the market structure in the mobile services market are about to undergo major change with the entry of three new providers. Changes in market shares up until 1998 are shown in Figure 5. Over the period C&W Optus and Vodafone increased their market shares at the expense of Telstra. Nevertheless, Telstra still has the largest market share. Following from the recent spectrum auctions, One.Tel has launched a national mobile network. Hutchison and AAPT are in the process of doing the same. This entry will occur in a market for mobile services that is growing at between 10 and 15 per cent per annum.

Figure 5: Market Shares – Network-based mobile services providers



Source: Australian Competition and Consumer Commission, *Competition for long distance mobile communications, A report about declaration of a long distance mobile origination*

service, January 2000

8.2.4. Market outcomes

Comparing mobile telephony prices over time is a difficult exercise. Each of the mobile network providers have a range of pricing plans which have varied over time. Within each package there are various handset subsidies, connection charges, access charges and call charges. Mobile network providers are also now offering free mobile to mobile calls during certain times of the day for calls that do not leave their network.

As the ACCC noted:

> The Commission is unable to comment with any authority on the overall price movements for mobile telephony because there is insufficient data to analyse the plethora of mobile pricing plans.[42]

The limited analysis that CRU was able to undertake on behalf of the ACCC revealed that the average per minute price paid by consumer for digital mobile services decreased by about 5 per cent per annum in real terms between 1997 and 1999. These calculations included access, connection and call charges. Handset charges were excluded.

The Productivity Commission estimated that Telstra's price of mobile telephony services for a residential package decreased in real terms by 1 per cent between February 1998 and June 1999. This excluded an estimated 10 per cent decrease in Telstra's prices in July 1999.

8.3. Conclusions

The major barrier to entry and competition in the wholesale level of the mobile services market is the availability of spectrum. Up until recently this restricted the number of mobile network providers to three. With the recent auctions, the number of providers will soon increase to six.

The high growth in demand for mobile services and the ability to differentiate mobile services with new data applications have made entry into the mobile services market attractive.[43] New entrants are disadvantaged somewhat relative to the incumbent providers by higher costs of network roll-outs (as a result of changes in environmental restrictions and the unavailability of the more preferable sites). However, they do not appear to be significant barriers to entry.

As is the case in other telecommunications markets, the major role of regulation has been to limit the extent to which barriers to entry into the wholesale local services

[42] Australian Competition and Consumer Commission, *Telecommunications Charges in Australia*, April 2000, p.41

[43] As demonstrated by the competition for spectrum and the preselection of the value of the spectrum for third generation mobile services to auctioned in the near future.

market can 'spillover' into the mobile services market. Given the reliance of mobile network providers on terminating access on fixed networks, there is scope for the provider of wholesale local services to uses its control over mobile-to-fixed call termination to distort competition in the provision of mobile services. This is exacerbated by the high degree of integration between the wholesale services market and the mobile services market. Regulation can reduce the scope for this to occur.

9. Internet

The internet is a market for the provision of information. With the growth in the information economy the demand for internet services has grown enormously. The Internet links users (via personal computers) enabling access to the world-wide web and services including e-mail and e-commerce.

9.1. Dimensions of the market

Product dimension

There appear to be no close demand-side substitutes for the internet. While users can obtain information in a variety of ways, they are not close substitutes for the internet either in terms of the speed at which the information can be obtained or the cost.

Access to the internet is possible using fixed-line and wireless networks. Services differ mainly by bandwidth which affects the speed at which information can be transferred.

Functional dimension

The internet industry is growing and evolving at a rapid pace. As a result characterisations of the functional levels of the market can rapidly be out-dated. For the purposes of this paper, it is helpful to separate the market into retail and wholesale levels.

Retail level

The retail level consists of internet service providers (ISPs). ISPs operate local networks of users and content providers. Users are connected to their ISP via their local network provider. The majority of ISPs are small servicing a limited number of users within their own local calling area. There are a smaller number of ISPs with regional or national presence. These providers link up their sites with backbone networks (see below).

Wholesale level

Providers at the wholesale level (known as Internet Access Providers (IAPs)) link ISPs (and hence users and content providers). IAPs tend operate in one of two

ways.[44] First, there are backbone providers who operate networks connecting a large number of ISPs across broad regions and provide for access to ISPs overseas. Backbone providers interconnect either directly or through another backbone provider to ensure any-to-any connectivity. Second, there are transit providers who operate smaller networks aggregating a number of ISPs and providing interconnection with backbone providers. Transit providers tend to be regionally-based.

There is a high degree of vertical integration between IAPs and ISPs. The major IAPs also have the largest shares of the ISP market. For example, Telstra Ozemail and C&W Optus are all backbone providers. As shown in Table 6 below, they also have large shares at the retail level of the market.

Geographic dimension

The internet market appears to be a national market with a large number of geographic sub-markets based on local calling areas. The majority of residential users of the internet dial-up their ISP to gain access to internet services. As these calls are often long-held calls it is less expensive for the users if their ISP has a point of presence within the same local calling area.

9.2. Competition in the internet market

The retail level of the internet market appears to be very competitive. The costs of setting up an ISP business are small and any sunk costs are minor. There are currently over 800 ISPs in Australia.

9.2.1. Barriers to entry into the wholesale level of the internet market

Barriers to entry into the internet market, are potentially more significant at the wholesale level. IAPs build backbone and transit networks linking ISPs throughout Australia and overseas. This requires wholesale transmission capacity both within Australia and to other countries.

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[44] Refer to the ACCC, *Internet interconnection: factors affecting commercial arrangements between network operators in Australia*, 17 February 2000

The major potential barriers to entry and competition at the wholesale level are the potential 'spillovers' from barriers to entry into other markets.

First, the major providers of domestic wholesale transmission capacity are also the major providers of backbone services. Investment in long-distance transmission links involve large sunk costs. Furthermore, given large economies of scale in the provision of long-distance transmission, it may be uneconomic for more than one provider to provide links between some cities or major population centres. It certainly is not economic for each backbone or transit network provider to provide these links. As a result there is the potential for barriers to entry into the provision of wholesale transmission services to 'spillover' into the wholesale segment of the internet market.

Second, there is the cost of international cable and/or satellite links to gain access to information overseas. An IAP has two options. One is to lease capacity on existing cables (and satellites). The other is to become a member of consortia to deploy international cables. The first approach involves lower costs. However, until recent times access to capacity has been difficult. Investments in new cable capacity and access to cost-effective effective satellite links has lessened these barriers. The availability of cost-effective satellite links has allowed smaller IAPs and even ISPs to by-pass large ISPs through backchanneling.[45]

9.2.2. Regulatory decisions

Two decisions under the regulatory regime have the potential to promote competition in the wholesale level of the internet market.

First, as noted above, the ACCC has declared long-distance transmission services between most cities and populations centres.[46] Given the vertical integration of the major providers of long-distance transmission links and backbone networks, declaration of transmission services limits the extent to which barriers to entry (in the provision of long-distance transmission) can 'spillover' into the provision of backbone network services.

[45] Backchanneling involves smaller IAPs making directly links with IAPs overseas by creating a point of presence in the US. Data is downloaded directly to the IAP in Australia by satellite. This by-passes the backbone provider in Australia.

[46] The exception being the Melbourne-Canberra-Sydney route.

Second, in 1998, the ACCC issued competition notices to Telstra under Part XIB of the *Trade Practices Act 1974* based on the ACCC's concerns that Telstra, as a backbone provider, was charging other backbone provider for information download from its sites, but refused to pay for information flowing in the other direction. Telstra's action may have enabled it to build-up its customer base in the short-term. Given the network effects in the provision of internet services, this may have resulted in Telstra gaining a significant competitive advantage. To the extent there are barriers to entry into the wholesale internet market, this may have had long-term effects on competition.

9.3. State of competition and market outcomes

Data on the state of competition and outcomes in the internet market are limited. There are four major providers at the wholesale level. Estimated market shares at the retail level are displayed in Table 6. These shares are likely to change rapidly given the significant growth in the demand for internet services and the entry currently being experienced in Australia.

Table 6: Estimated retail internet market shares – based on subscribers 1997 & 2000

	1997	**2000**
Telstra	18%	20%
Ozemail	20%	15%
Go Connect	(incl. in other)	9%
FreeOnline	(incl. in other)	8%
Global Freeway	(incl. in other)	6%
C&W Optus	(incl. in other)	5%
Other	62%	37%

Sources: ***1997*** – Paul Budde ISP Supplement –as quoted in Sidak, op.cit. ***2000*** – Estimated by ABN Amro

Recent trends in retail internet prices are unclear. Accurate comparisons of the prices of internet services over time are difficult to make given the large array of internet plans available to consumers (each with different up-front fees, 'free' time and timed charges). These plans are changing rapidly as ISPs develop packages to suite a growing population of heterogeneous users.

9.4. Conclusions

Barriers to entry into the internet market do not appear to be significant. Low barriers to entry and high rates of growth in the demand for internet services has seen significant entry. At the retail level the sunk cost of establishing an ISP business are small. As a result, there has been a proliferation of entry and exit.

Low barriers to entry and the high rates of growth of the internet market have also made entry attractive at the wholesale level. Four backbone network providers and a number of transit providers are now well established.

Although 'natural' barriers to entry at the wholesale level are low, there is scope for barriers to entry into the provision of wholesale transmission services to 'spillover' into the wholesale level of the internet market. To the extent that transmission links between major cities and population centres are not contestable and there remains a high degree of integration between the provision of these services and the wholesale level of the internet market, there is scope for competition in the market to be artificially distorted.

10. Data services

The distinguishing feature of data services is the capability to transmit information at high speeds. The demand for data services has grown with the growth of the internet and the information economy.

There are two broad types of data services. The first are private data networks, such wide-area networks. Some users, particularly business users, require links that allow the transfer of data between fixed sites. For example, banks require links that enable the carriage of information between automatic teller machines and central offices. The second type of data services provide users with high speed access to public data networks such as the internet. As discussed below, the form of competition within these market segments is likely to differ.

10.1. Dimensions of the market

Product dimension

There appear to be no demand-side substitutes for data services. Although there are other means by which users can gain access to or transfer information, most often they are not comparable to data services in terms of the speed of access or the cost.

Within the market there is a range of different technologies to provide data services, each having different costs and capabilities. A number of data services are available for business users requiring a private data network, including leased lines, frame relay and ATM. For users requiring high speed access to public data networks, ISDN and xDSL technologies provide the capability for copper wires to convey information at significant speed. Optical fibre networks are another alternative.

Functional dimension

There are two functional levels in the market for data services, the retail level and the wholesale level.

Retail level

Retail providers package data services to meet the needs of retail consumers. Most retail providers develop packages of services to meet the large variety of data needs in the business community. Retail providers purchase wholesale data services from network-based and access-based providers in the wholesale level of the market.

Wholesale level

At the wholesale level there is a range of providers varying by the extent to which they combine their own network infrastructure with those of other providers.

Ubiquitous network-based providers such as Telstra provide data services within their own network. By directly connecting users to their network, Telstra can provide high speed-links to public data networks, as well as private data networks.

Other network-based providers have more limited coverage. For example, AAPT and MCI Worldcom have optical fibre networks within CBD areas. C&W Optus has an optical fibre network passing over 2 million homes. These providers provide high speed links to public data networks by directly connecting customers to their networks. While they can establish private data networks, they must purchase access services from a ubiquitous network-provider (most likely Telstra) if some users are outside the reach to their network.

Access-based providers have do not have local network infrastructure. These providers combine some of their own network elements with services purchased from network-based providers (including access to the users) to provide data services.

Geographic dimension

As noted above, there are large differences in the costs of deploying local networks (for voice and data services) across regions and differences in the demands of users within regions. This alters the scope for network-based entry and competition at the wholesale level. In some areas, such as CBD areas, it may be economic for a number of network-based providers to enter and compete. In many rural areas of Australia, it may only be economic for one network provider to serve the entire market segment.

10.2. Competition in data services

As noted above, competition in data services can develop through both network-based competition and access-based competition. The way in which competition has developed and the barriers to entry differ depending on the form of competition.

10.2.1. Network-based competition in data services

The issues relevant to understanding the development of network-based competition in data services are similar to those for local voice services. Investments in local networks are likely to driven by the combined demand for data and voice services. These demands are likely to differ across regions, as do the costs of deploying local networks. As result, there is not one 'typical' market segment. Entry and competition is more likely to occur in market segments where there the population is densely clustered and there is a high proportion of (business) customers with significant demand for high speed data services.

The scope for the economic deployment of alternative local networks is likely to change over time with changes in technology and the demands of users. The commercial feasibility of alternative technologies depend upon a range of factors including their cost structure and the quality and speed of the data services they can provide.

Entry barriers

A major 'natural' barrier to entry into the provision of network-based data services are the large sunk costs involved. For example, MCI WorldCom is in the process of deploying an optical fibre network in Sydney and Melbourne with capital expenditure during the first five years of operation of $110 million.[47] In the event MCI WorldCom exits the market, it is unlikely that a significant portion of this investment will be recovered. These sunk costs combined with the likelihood that many market segments may only sustain one provider make entry into many regional market segments improbable.

Perversely technological change may exacerbate these effects. Developments in xDSL technology may reduce the substitutability of alternative technologies for copper-based networks. XDSL technology has increased the capacity of copper-wire to carry high speed traffic over longer-distances. Although improvements in the capacity of the copper-wire local loop is welfare-enhancing, it reduces the scope for other technologies to become a viable alternative. Technological improvements in this case may increase 'natural' barriers to entry.

The major artificial barrier to network-based competition in regional segments of the data market is the potential for 'spillovers' from other market segments. In some cases private data networks will include sites located in regions where local network-

[47] Australian Competition and Consumer Commission, *Declaration of local telecommunications services*, July 1999

based entry is uneconomic. In such cases, a ubiquitous network provider will have a competitive advantage over more limited network-based providers. By failing to provide access to users in these areas or doing so at an inflated price, the ubiquitous network provider can gain a competitive advantage in the data services market. In this way 'natural' barriers to entry into some regional segments of the market can 'spillover' into other market segments.

Regulatory decisions

In 1997, the ACCC deemed to be declared a digital data access service which connects users to an alternative provider's switch. The ACCC also recently declared ISDN originating and terminating access. By creating an obligation for these services to be provided the declaration reduces the scope for the barriers to entry into some regional segments of the market to distort entry and competition in other regional segments.

10.2.2. Access-based competition in data services

As an alternative to deploying local networks, providers can enter the data market and provides services through gaining access to the local network infrastructure of incumbent providers.

Entry barriers

'Natural' barriers to access-based entry into the wholesale data services market do not appear to be significant. Although some costs are sunk, it is possible that some of the major assets (such as switches) can be sold in the event of exit from the market.

The major artificial barriers to entry is the scope for barriers to entry in other telecommunications markets to 'spillover' into the wholesale data market. To develop wholesale data services, access-based providers require both wholesale transmission services and high-speed local access to users. As noted above, there are significant barriers to entry into some segments of the wholesale local services market and the wholesale transmission market. Furthermore, given the high degree of integration between these markets, there is potential for these barriers to entry to 'spillover' into the wholesale data services market.

Regulatory decisions

The declaration by the ACCC of wholesale long-distance transmission services limits the scope for providers of this service to inhibit entry and competition in the provision of wholesale data services.

More important is the recent decision by the ACCC to declare an unconditioned local loop service. This allows access-based providers to employ their own technologies in providing data services to users without the need to duplicate local network infrastructure.

Given the integration between wholesale local services and data services, this declaration has the potential to limit the scope for barriers to entry into the local services market to 'spillover' into data market.

10.3. State of competition and market outcomes

Data on the state of competition and outcomes in the data market are extremely limited. There are a number of providers in the retail level of the market. In the wholesale level there are a number access-based providers, primarily providing frame relay and ATM services. Data on market shares are sparse.

Data on price trends are also sparse and cover only a proportion of the market. The Productivity Commission has estimated that between 1998 and 1999 Telstra's listed prices for leased lines, frame relay and ATM services decreased by between 1 and 1.5 per cent in real terms.[48] As these price comparisons exclude the prices charges to large businesses it is not clear what conclusions can be drawn.

10.4. Conclusions

Barriers to network-based entry into the data market are significant. In many regional areas of Australia, the entry of an alternative network provider is uneconomic. In these and other areas, the major developments in competition are likely to occur through access-based entry. As in other telecommunications markets there is scope for the 'natural' barriers to network-based entry to 'spillover' to distort entry and

[48] Productivity Commission *International Telecommunications Regulation, Inquiry Report*, August 1999.

competition in the contestable segments of the data market. This is likely to persist so long large segments of the wholesale local services market remans uncontestable.

11. Future role of the regulatory regime in telecommunications

Regulation is not costless. There are risks that regulation will distort economic incentives (particularly in relation to investment) to the detriment of consumer welfare. The major role through which regulation can enhance consumer welfare is by removing impediments to the development of competition in markets or market segments where competition will promote economically efficient outcomes. This can be achieved by designing a regulatory framework that enables the regulator to:

- remove artificial barriers to entry and competition in markets and market segments; and

- limit the extent to which barriers to entry in one market or market segment can 'spillover' into other market segments.

'Natural' and artificial barriers to entry differ significantly across telecommunications markets. As a result, so does the scope for entry and the scope for regulation to promote competition.

The most significant 'natural' barriers entry are in the wholesale local services and data markets where in many cases the deployment of alternative local networks is necessary in order to compete. This involves large sunk costs. Furthermore, in many geographic areas in Australia it is uneconomic for more than one local network provider to service the entire market segment. The large sunk costs combined with the absence of a formal tendering scheme makes entry into these market segments improbable. Even where it is economic for more than one local network provider to enter, an entrant must build-up a significant market share to be profitable. Entry into these market segments is likely to take time as potential entrants adopt strategies to reduce the risks involved.

For the foreseeable future, competition among alternative local networks is likely to be limited to market segments where users are densely clustered and there is a high proportion of (business) customers with significant demand for high speed data services. Even within these areas alternative network roll-outs are likely to be targeted. Over time the capabilities of alternative technologies may improve and their costs decrease. Whether or not this will reduce 'natural' barriers to network-based entry is debatable. Changes in the capabilities of alternative technologies must be weighed against the significant improvements in the capability of the copper-wire local loop.

'Natural' barriers to entry into the wholesale level of telecommunications markets are much lower where access-based competition is feasible. Sunk costs are smaller, as is

the market share required by entrants in order to be profitable. In some cases, entrants can be profitable by targeting niche parts of the market. This is demonstrated by the level of entry and competition in the provision of national long-distance and international call services. Entry into the international call market has been particularly prevalent where access-based providers can gain access to a large part of the market with the targeted roll-out of their services.

Of themselves, 'natural' barriers to entry should not be a reason for regulation. Barriers to entry of this nature exist in many markets. Where there is an issue for regulation is where there is scope for 'natural' barriers to entry to 'spillover' into other markets or market segments. The high degree of vertical and horizontal integration within and between telecommunications markets and the prevalence of network effects creates the potential for barriers to entry into some market segments to 'spillover' into other market segments. Further, so long as large segments of the wholesale local services market remain uncontestable, there is scope for the incumbent provider of those services to distort competition and entry in the provision of other telecommunications services, including mobile, international and national long-distance call services.

The regulatory regime has and will continue to be important in the development of competition in telecommunications markets. A review of the decisions made under the current regulatory regime suggests that in particular access regulation has played a key role in prompting competition at the wholesale level in a number of markets. Of crucial importance is the regulation of originating and terminating access to customers. So long as there are significant barriers to entry, there is scope for the provider of these services to inhibit entry and distort competition in other markets. The observation that competition has developed in markets that are dependent on originating and terminating access is evidence of the success of the current regime, rather than a reason to alter or remove the regulation.

AUSTRALIAN TELECOMMUNICATIONS INVESTMENT UNDER THE 1997 REGULATORY REGIME

prepared for

AAPT Limited

by

ACCESS ECONOMICS

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Contents

Tables

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Executive Summary

As part of its submissions to the Productivity Commission's inquiry into telecommunications-specific competition regulation, AAPT Limited asked Access Economics to examine the impact on investment of the 1997 telecommunications regulatory regime created by the *Telecommunications Act 1997* and the telecommunications-specific amendments in Parts XIB and XIC of the *Trade Practices Act 1974*.

An access regime is an important part of the creation of a competitive market in a network industry such as telecommunications, so there is no *in-principle* inconsistency between establishing such a regime and the long-term interest of end-users (LTIE) test or its component criteria, as spelled out by Part XIC. Similarly, there is nothing in the *design* of the present access regime that is likely to cause inefficient investment. However there is a chance that the extra uncertainty in the *transition* to a new regime may delay some investment.

An efficient access charge must be cost-based, incremental and forward looking. Charges based solely on actual or historical costs will not give appropriate incentives to access providers or seekers to build efficient networks or otherwise minimise their costs of supply.

An access regime with efficient prices will, in principle, weaken the market power of an incumbent monopolist, leading to lower retail prices, expanded network capacity and higher on-going investment. While competition is growing, the incumbent will not, however, have incentives to invest efficiently or to allow access to the services of its facilities at efficient prices. It is likely that Telstra's adverse assessments of the appropriateness of access pricing declarations and the pattern of entrants' network investments are strongly influenced by its continued position as the dominant incumbent.

Although the appropriateness of the ACCC's quantitative assessments and implementation of the new regime can probably only be tested over time, these have been consistent with LTIE criteria and efficient access pricing principles, and the ACCC has not adopted any positions which, in principle, will have created disincentives to efficient investment.

It is almost impossible to say what the efficient level or distribution of telecommunications investment should be, since this is, in part, dependent on the structure of the market being serviced (including the creation of the wholesale market through the access regime). It is also difficult to assess whether the observed levels and placement new telecommunications capacity is efficient, since it is likely that some of what was *ex ante* efficient and profitable investment will prove to be wasteful and unprofitable.

While there is little consolidated information about the state and development of the Australian telecommunications industry over the relevant period, we have gathered data that allows some conclusions to be drawn about trends in the level, distribution and timing of telecommunications investment in Australia.

There is no evidence that investment levels have fallen as a consequence of the new regime, or that the level or pattern of investment have been *ex ante* inefficient. On balance, the data available suggests that, while the uncertainty associated with the transition to the new regime may have delayed some investment decisions, the operation of the regime itself has spurred higher and potentially more innovative levels of investment than might have emerged from a deregulated market without the access regime established by Part XIC. There is also evidence that the regime has induced investment in telecommunications facilities by private users.

1. Background

1. Consistent with the competition reviews being undertaken in other jurisdictions and industries, the Productivity Commission (PC) has been asked by the Commonwealth Government to inquire into telecommunications-specific competition regulation. In particular, it has been asked to examine the telecommunications-specific parts of the *Trade Practices Act 1974* (TPA) (Part XIB, dealing with anti-competitive conduct and record keeping rules, and Part XIC, dealing with the access regime) and various parts of the *Telecommunications Act 1997*.

2. As part of its submissions to the PC's inquiry, AAPT Limited asked Access Economics to examine the impact on investment of the 1997 telecommunications regulatory regime created by the *Telecommunications Act 1997* and the telecommunications-specific amendments to the TPA. In particular, we were asked to gather and examine the available data on Australian telecommunications investment and make an assessment of the effects, if any, of the introduction and operation of the regulatory regime. We were also asked, to the extent possible, to compare the Australian experience with that in other countries in which the telecommunications market had been deregulated and some form of access regime implemented.

3. The Issues Paper released by the PC in June 2000 specifically mentions investment issues in two questions:

> *Do the (anti-competitive) provisions have adverse or positive effects on investment in infrastructure? (p 16)*
>
> *To what extent could existing access pricing approaches lead to over or under-investment in infrastructure or to inefficient entry? (p. 18)*

These questions have been addressed in the analytical discussion and, to the extent it allows, in the review of Australian telecommunications investment data.

4. The body of this report is divided into three Sections. The first briefly examines some of the drivers of investment in network industries, and the impact of opening previously monopolised industries to competition with the introduction of an access regime. The second Section examines the (limited) data available on recent Australian and overseas investment in telecommunications. The last Section draws some conclusions based on the analytical discussion and the evidence of investment experience since the introduction of the 1997 competition and access regime.

2. Access regimes and infrastructure investment

5. Investment decisions are driven by myriad factors in practice, and there are many alternative economic approaches to explain the level of investment undertaken by particular firms or in specific industries. This Section briefly examines some of the drivers of investment in network industries, and the impact of opening previously monopolised industries to competition with the introduction of an access regime. In particular, it discusses the impact of introducing an access regime on the investment levels of an incumbent firm. The levels of efficient capacity and investment in competitive conditions are also discussed to establish a benchmark, as are the effects of uncertainty about future levels of demand.

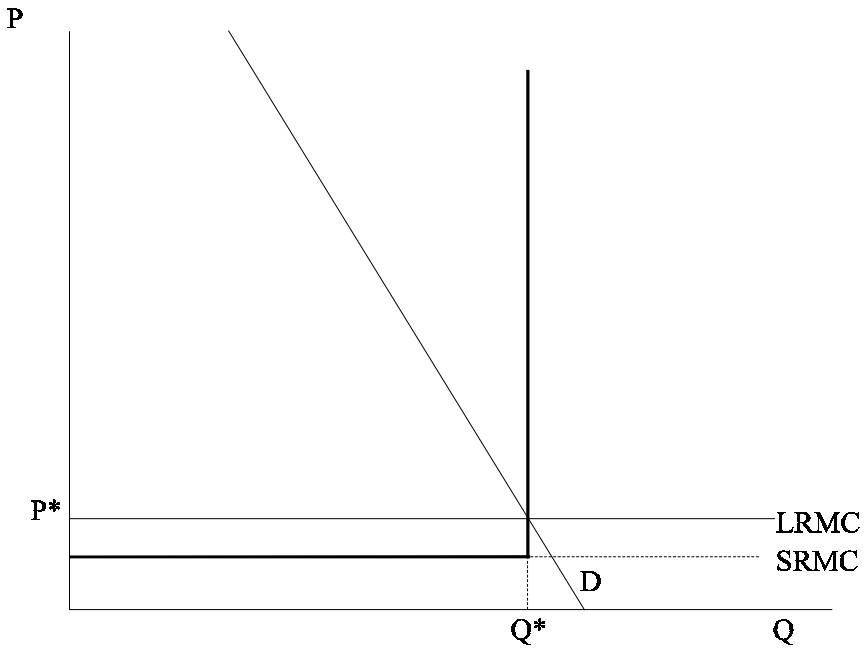
2.1. Capacity and investment in a stylised market

6. Consider first a simple market in which a single (monopoly) firm makes investment decisions that determine the capacity of its network. The examples below are highly stylised, but most of the propositions derived from them generalise to more complicated situations.

2.1.1. Known demand

7. Figure 2-1 shows an industry with constant variable costs of supply (SRMC) and a constant long-run capital cost of capacity (equal to the difference between SRMC and the long-run marginal cost curve (LRMC)). The market is for a retail service in which the direct demand schedule, D, and the constant long-run supply curve (here equal to LRMC) determine the efficient level of capacity, Q*, and, together with the rate of depreciation of the infrastructure, the optimal level of ongoing investment. The efficient short- and long-run retail price is P* which rations demand to Q* and ensures a margin above variable costs sufficient to ensure long-run total costs are covered.

Figure 2-1: Efficient pricing and capacity under long-run constant returns to scale



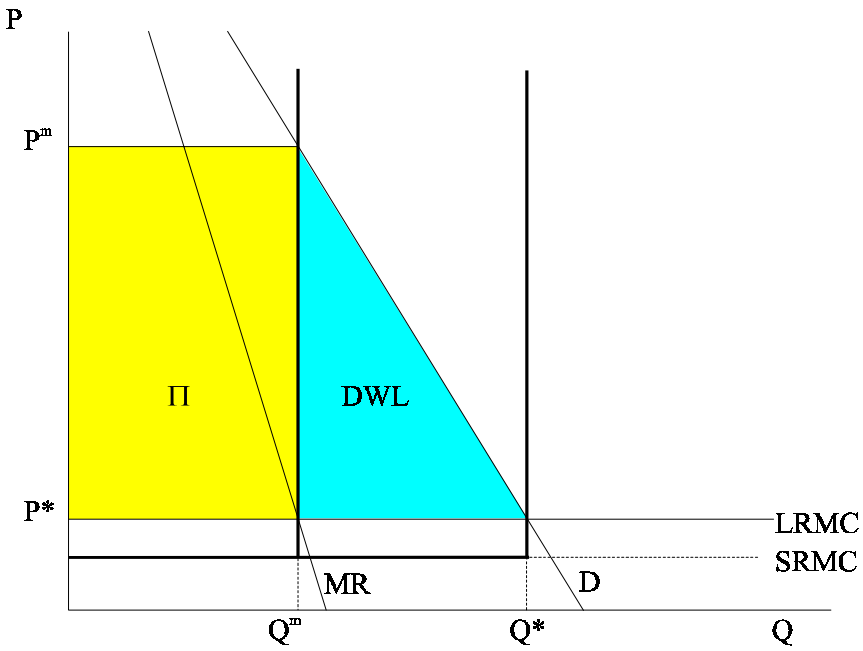
8. In this case, installing capacity above Q* would not generate sufficient additional revenue from an efficient short-run price to cover costs (the subsequent losses being a signal to reduce

investment to allow the network capacity to decrease[1]). Similarly, efficient short-run pricing at a capacity below Q* would generate rents that would signal the need to expand the network. Investment in this case is driven by the need to maintain capacity at Q* and, with stable cost and demand conditions, would simply be a steady expenditure in each period to replace infrastructure at the end of its useful life.

9. Although the constant per unit costs illustrated in Figure 2-1 are consistent with the creation of a competitive market, the monopoly case can be justified as the product of network economies which do not affect the costs of service provision shown in the figure. That is, in the absence of an access regime, the demand network effect will have concentrated all demand for the service on the network of one supplier. Given the transactions and other costs of interconnection, it is also likely that the constant costs assumed above would tend to generate monopoly over competition, as a single firm could probably coordinate its network at lower total cost than a competitive market which has a layer of (higher) external coordination costs.

10. Figure 2-2 illustrates the monopoly rents (Π) that could be generated by an incumbent firm that restricted capacity to the long-run monopoly level, Q^m, determined by the intersection of the marginal revenue schedule, MR, associated with demand and LRMC. Although network capacity is set below the efficient quantity, the monopolist subsequently prices "efficiently" in the short-run at P^m to ration demand to this level. In a competitive market these rents would be a signal to increase capacity, as firms race to install networks that will earn a normal long-term return, and a windfall short-run share of the rents available until industry capacity reaches Q*. In the absence of competitive or regulatory pressure, a monopolist would hold capacity at Q^m (or the equivalent as cost and demand conditions change), and would sustain the monopoly rents while creating an ongoing social cost equal to the deadweight loss triangle (DWL).

Figure 2-2: Monopolisation through restricted capacity



[1] Note, however, that over-investment may not be quickly reversed through depreciation, especially if network-wide performance and reliability is important.

11. In this monopoly case investment would again be driven by replacement of facilities needed to maintain capacity, but at a level lower than would be expected under competitive conditions, commensurate with the restriction of capacity.

12. A monopolist could improve on the rents illustrated in Figure 2-2 by adopting two-part prices (retail access fees plus per unit charges). This would allow a per unit charge close to SRMC, and access fees that extracted the associated consumer surplus. With sufficient information about retail customers, and natural or statutory prohibition of resale, the monopolist could, in principle, appropriate all of the social gains from provision of the service (here comprised entirely of consumer surplus – the area below the demand curve and above the line at price P* in Figure 2-1). In this case it would have an incentive to invest to maintain capacity at Q*, investment would proceed at the efficient levels and there would be no social deadweight cost. In practice, the variety of individual consumer demands (implying a need for individually tailored access fees) and the difficulty of preventing or policing resale mean that unrestricted monopoly profits will be maximised through a combination of restricted capacity, efficient short-run per unit prices above SRMC and access fees which leave consumers with some net surplus, but still create deadweight costs.

2.1.2. Uncertain demand

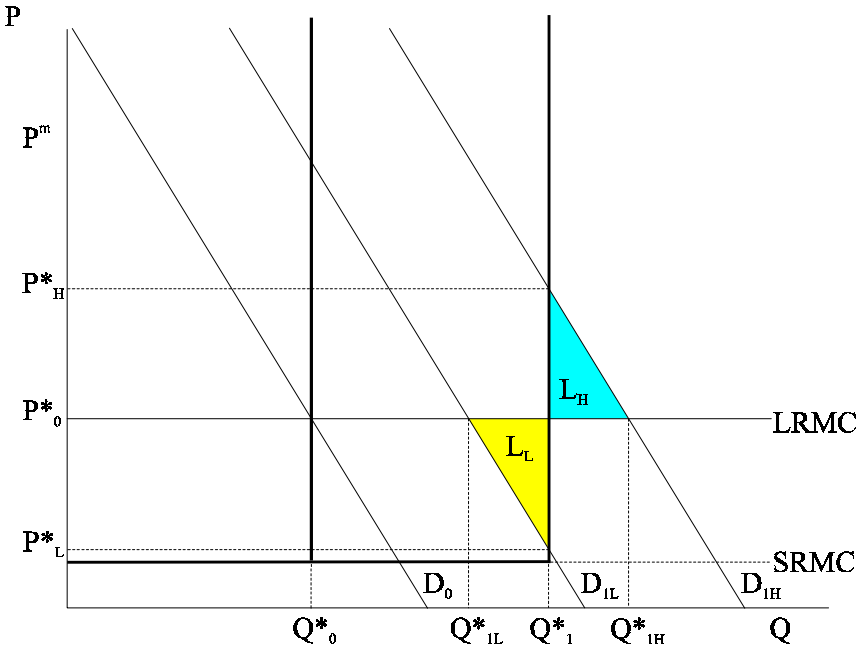
13. The discussion above assumes certain and static demand and costs, in which investment is solely a mechanical reaction to maintain an optimal (or profit maximising) level of network capacity. While factors such as interest rates and tax treatments still affect the cost of new infrastructure, the timing and level of investment is driven by the fixed optimal level of network capacity. In practice, investment will also be influenced by the need to vary capacity to meet expected future demands, and these will not be known with certainty. Larger or smaller networks may be optimal *ex post*, but investment decisions have to be made based only on *ex ante* expectations and information[2].

14. Figure 2-3 illustrates an extension of the previous examples, in which network capacity must be expanded from an initial optimum in period 0, Q^*_0, to allow for one of two future alternatives. Demand is expected to be either low, at D_{1L}, or high, at D_{1H}, both with equal probability, and would imply optimal capacities of either Q^*_{1L} or Q^*_{1H}, respectively. It is assumed that expansion of capacity must be planned and committed to in period 0 before the future level of demand is known.

15. The *ex ante* socially optimal level of capacity, Q^*_1, minimises the *expected* deadweight cost that will eventuate from having to set capacity above or below the *ex post* efficient level, balancing the probability-weighted marginal changes in those deadweight costs. If D_{1L} (D_{1H}) emerges, the short-run efficient price will be P^*_L (P^*_H), the deadweight cost will be L_L (L_H) and the incumbent will make losses (profits) from pricing below (above) the long-run marginal cost of supply.

[2] While the discussion to follow concentrates on uncertain demands, there will be parallel implications for investment when demand is certain, but the network capacity varies uncertainly because of technological advances. For instance, demand may be certain to double, but it may not be clear what the switching capacity of a new network will be. A larger transmission capacity may have to be installed if switching and multiplexing technology does not produce the expected network capacity.

Figure 2-3: Optimal capacity with demand uncertainty



16. As illustrated, Q* lies half-way between Q^*_{1L} and Q^*_{1H}, and P^*_L and P^*_H are below and above P^*_0 by equal amounts, the reflecting the linearity of the demands and the assumption of equal likelihood of each alternative. The *ex ante* optimum capacity will be higher or lower as the likelihood of the high demand case increases or decreases, respectively. The size of the deadweight costs will depend, *inter alia*, on the degree of variation in expected demand and the demand elasticities. The impact may be small if demands are growing constantly, so that any error can be compensated for in following periods with greater or lesser investment[3].

17. Note that, once the increase in capacity is determined, the retail price must be above or below the efficient long-run level. In a continuous version of this example, in which demand and capacity grow smoothly over time, prices would consequently fluctuate around LRMC depending on the balance of changes in short-run demand and installed capacity.

18. An unregulated, profit-maximising monopolist faced with uncertain future demand will attempt to maximise expected profits, and the choice of capacity (and levels of investment) will depend on the form of pricing. When constrained to set a single price (no access fees or discriminating prices), the profit maximising strategy is to set capacity where LRMC and marginal revenue intersect, and the alternative increases in demand will produce two *ex post* profit maximising levels of capacity below the socially optimal levels. The *ex ante* expected profit maximising level of capacity will be a probability weighted average of these. Once the level of demand is known, the monopolist sets price to generate demand at the quantity where the (capacity constrained) short-run marginal cost and realised marginal revenue schedules intersect.

19. If demand is low, installed capacity will be greater than the profit maximising level and price will be lower than would have been set if the low demand had been known beforehand with certainty. Conversely, if the high demand emerges, capacity will be lower than the *ex*

[3] That is, Figure 2-3 illustrates a long-run outcome to which the firm converges, but which is constantly changing. The errors and social deadweight costs incurred in the sequence of actual short-run outcomes may therefore be much smaller.

post profit maximising level and price will be set higher (although this will produce less than maximum profit).

20. With uncertain demands, there will still be an incentive to set capacity below the optimal level (and to invest less than is efficient as demand expands). The monopolist will set capacity to maximise the probability weighted average of the profits that accrue from efficient short-run prices given the alternative demands, and this will tend to be the average of the profit maximising capacities associated with each of the two demands.

21. When the monopolist has the option to set multi-part prices there will again be an in-principle incentive to set the optimal *ex ante* level of capacity illustrated in Figure 2-3, but limitations on setting differential access fees will mean there will still be incentives to restrict capacity and under-invest in practice. These incentives will be reduced if the monopolist is subject to an effective regulatory regime that ensures it supplies close to the socially optimal level of services, at a price close to LRMC. Implementing efficient regulation of this sort is likely to be difficult for various reasons, but more efficient levels of network capacity and investment should be natural consequences of a regime that induces more competitive market outcomes.

22. Note that the efficient *ex post* socially optimal and profit maximising solutions both have final retail prices which vary with the level of realised demand. One of the drawbacks of an effective regulatory regime is that it is unlikely to give the incumbent monopolist the flexibility to raise prices when this is a necessary, and efficient, short-run consequence of *ex ante* investment decisions made under uncertainty. Nevertheless, and as also discussed below in relation to access pricing, the inability to raise prices when demand growth exceeds capacity may give the incumbent incentives to expand capacity to increase the contribution to expected profits from the high demand outcome (albeit at the cost of bearing higher fixed costs when demand turns out to be low). That is, because the firm will not be able to raise price to the efficient level after having committed to an inadequate level of capacity, its profit maximising response may be to install more capacity to generate greater sales and revenue at the regulated price.

2.2. Access pricing and infrastructure investment

23. The discussion above assumed that the incumbent firm sold only to final customers in a retail market. An access regime that required the incumbent to allow entrants to use its network would let those firms compete for a share of the retail market, provided their total costs (their own variable costs of supply and the price paid for access) allowed them to meet or undercut the incumbent's retail prices.

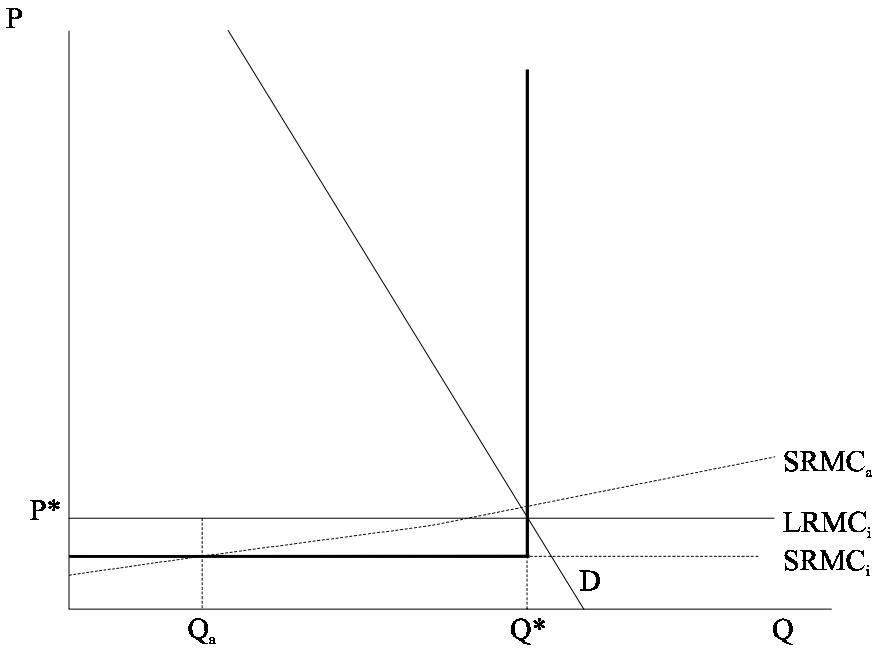
24. The effect of the access regime on installed network capacity, and associated ongoing investment, will depend, *inter alia*, on the relative costs of the incumbent and entrants, the incumbent's original retail pricing behavior and strategies, the basis chosen for setting the access charges and the predictability of future demand.

2.2.1. Known demand

25. Figure 2-4 illustrates an example based on Figure 2-1 in which the firms seeking access to the incumbent monopolist's network have, collectively, increasing variable costs of supply, $SRMC_a$, which lie below the variable costs of the incumbent over some range of output. The socially optimal outcome in this case would be for the access seekers to supply up to the point, Q_a, where their variable costs match those of the incumbent, with the balance of the total, Q*, supplied by the incumbent. Access to the incumbent network would be

charged at the marginal cost of capacity to the incumbent[4], ($LRMC_i$ - $SRMC_i$), and the entrants would be indifferent between interconnecting and building their own facilities[5]. The incumbent receives the same level of total contributions to cover its capital costs, the market price is unchanged (at P*, equal to $LRMC_i$ at Q*) and society as a whole is better off for being able to take advantage of the access seekers' lower variable costs of providing a share of total output.

Figure 2-4: Efficient interconnection and capacity with an access regime



26. When the access seekers have the same constant costs of production as the incumbent the efficient level of access will be indeterminate. Introducing an access regime would tend to break the network monopoly effect that allowed for a single original incumbent. Consequently, while there may still be cost factors which favor a network controlled by a single firm rather than many smaller firms, the market effectively becomes competitive, with the incumbent firm's monopoly power transferred to the wholesale level.

27. If the access seekers are able to install their own capacity at lower cost per unit than the incumbent (they have a LRMC schedule below $LRMC_i$ over some range) they would have an incentive to invest in capacity up to the level where their costs meet those of the incumbent (or the price charged for access). If access is priced at the constant per unit cost incurred by the incumbent, rather than the cost to the access seekers, it would lose market share to the

[4] This cost is no longer easily identified if the network or capacity is used to jointly and simultaneously produce several services. A similar analysis could, however, be applied to a market for intermediate transmission or switching services common to the various final retail services. Demand for this intermediate service would be derived from demands in the various retail markets, the production technologies and market conditions (competition or monopoly). Nevertheless, care needs to be taken to allow for the state of downstream markets when assessing the efficiency of alternative pricing and investment outcomes in this framework.

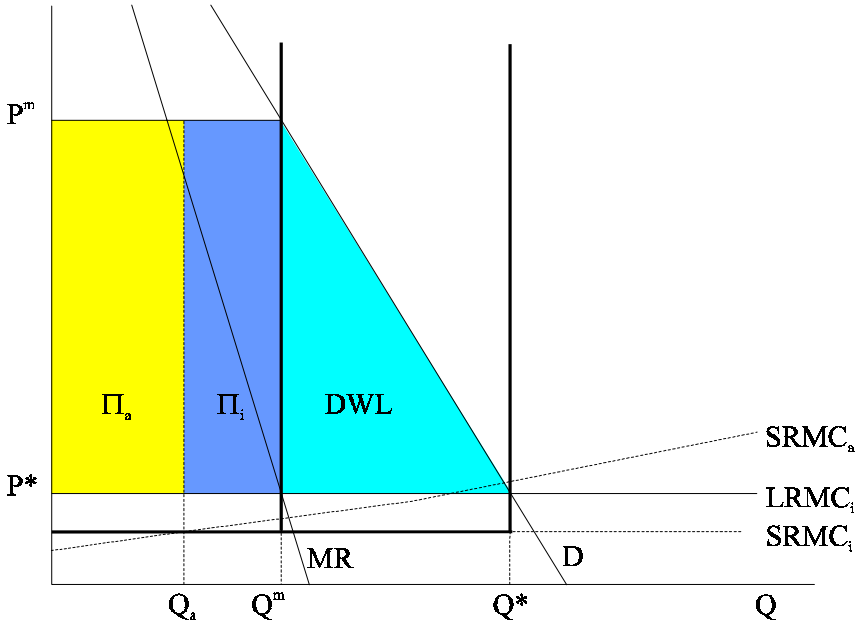
[5] This is provided interconnection is guarantied once their own facilities were constructed. Note that this discussion also abstracts from the direct costs of interconnection which would have to be borne by the incumbent and access seekers. If these were largely fixed and independent of the level of use of the incumbent's facilities, the solution illustrated in Figure 2-4 would still apply, only the access seekers would likely absorb the interconnection costs out of the surplus available from their lower variable costs.

access seekers, would decrease its network capacity over time, and the long-run equilibrium would have both the original incumbent and entrants sharing the market in proportions derived solely from their relative costs. In this equilibrium the original firm may even end up buying the services of the entrant's new network, depending on the relative quantities at which the entrant firms' capital and variable costs rose to the level of the incumbent's constant unit costs.

28. This example broadly illustrates the objective of TSLRIC-based access and interconnection charging. Provided access is properly priced, entrants build their own networks only when it is efficient to do so and the incumbent firm continues to recover all of the costs of its network over time. When entrants are able to install capacity at lower cost than the incumbent, it must reduce its access charges to reflect the lower returns that the sunk investments can now generate. However, problems arise when incumbent exercises market power.

29. Figure 2-5 illustrates, in the example shown in Figure 2-4, the initial effect of the incumbent setting the market-wide monopoly price, P^m, and simultaneously allowing access at the efficient level, Q_a, at the efficient access price. Without any other response from the incumbent, access seekers are able to obtain a substantial share, Π_a, of the monopoly rents. The situation illustrated is unlikely to be stable. If it is unable to restrict access to the services of its facilities, the incumbent will reassess the profit maximising level of capacity, possibly on the basis of the residual demand ($D - Q_a$) available to it after access seekers capture that part of the market. This would require the incumbent to increase network capacity and reduce the monopoly price (and the associated rents accruing to access seekers). In practice, the likely outcome would be far more complicated, as access seekers would attempt to gain a greater share of the market than just Q_a while there were still rents to be had, and the incumbent attempts to recapture a larger share of total demand.

Figure 2-5: An unstable initial market division after introducing an access regime



30. In general, from a situation where an incumbent has exercised market power to restrict supply and raise price, requiring the incumbent to provide access to its facilities at prices based on the incremental cost of capacity should lead to lower retail prices and increased (and efficient) investment. If the access seeker was a single firm, rather than the atomistic

fringe assumed above, it is likely that it would have an incentive to seek a greater share of the market and associated rents, and would attempt to gain access to more than Q_a of the incumbent's facilities at the efficient price. The incumbent would, of course, be expected to attempt to protect its rents through delays in, *inter alia*, providing access and interconnection and negotiating a commercial access arrangement. Where information asymmetries made it possible, this would also include misrepresenting the incremental costs of providing access and the services of its facilities to both access seekers and regulators.

31. The discussion above assumes that access seekers are charged the efficient, incremental price for use of the incumbent's network capacity. An access fee calculated on the basis of the Efficient Component Pricing Rule (ECPR or Baumol-Willig rule) would be equivalent in this example to the difference between P^m and $SRMC_i$, and would compensate the incumbent fully for the loss of market share. This would lead to no price, capacity or investment response from the incumbent when it was required to provide access, and no demand from access seekers for use of facilities beyond Q_a (the quantity at which their marginal costs, inclusive of the access fee, reach P^m). It would, however, induce inefficient network construction by access seekers, provided that interconnection of the competing networks was priced efficiently. This would be the only means by which entrants could gain a share of the rents generated by the monopoly price, and would lead to competition that would drive retail prices down, albeit at the cost of duplication of the network capacity.

32. While there will be competition for the congestion rents as long as capacity is below the optimum level, the delays associated with constructing new networks, and the regulatory and negotiating costs that the incumbent can impose on interconnecting entrants, will mean that entrants will have a strong incentive to price only marginally below the incumbent in the short to medium term. This effect will be most evident if, as has occurred in Australia and many other countries, full deregulation is preceded by a period of regulated duopoly.

33. When the incumbent sets perfectly discriminating multi-part prices access seekers will disrupt the equilibrium by effectively reselling services and introducing competition for customers through discounted rental fees. That is, if third-party access is provided at an efficient price based on the long-run marginal cost of capacity, access seekers will establish themselves by providing retail services using the incumbent's facilities, priced at or below the incumbent's unit price but with rental charges sufficiently lower to attract customers. This incursion into the incumbent's market could extend beyond Q_a, provided the entrants were willing to trade-off gains from rental fees against the marginal losses from unit pricing of services below $SRMC_i$. Network capacity and investment would be unchanged from the efficient levels in this situation, as would the retail unit prices, but retail rental prices will fall.

34. In practice the incumbent will not be able to set perfectly discriminating rentals and, as noted in paragraph 11, will have maximised the profits from multi-part pricing with a combination of restricted capacity, efficient short-run per unit prices above SRMC and rental fees which will leave consumers with some net surplus, but still create deadweight costs. In this situation allowing third-party access at efficient incremental prices will again reduce retail rental fees as access seekers build market share through resale. If the entrants are better able than the incumbent to identify market niches and tailor pricing packages, allowing access should also reduce unit prices and may then increase network capacity and associated investment.

2.2.2. Uncertain demand

35. Provided the incumbent initially prices efficiently, allowing third-party access at an efficient price has no impact on the investment problem created when future demands are

uncertain. The access seeker's use of existing facilities is inframarginal, whereas the *ex ante* efficient level of future capacity is determined by the growth of demand at the margin. Third-party access may, however, influence investment if access seekers have significantly different views of the likely level of future demand compared with the incumbent. For instance, a wide-spread belief that the incumbent has underestimated the likelihood or level of future high demand would create expectations that retail prices will rise, and that there will be congestion rents available to suppliers able to meet the unsatisfied demand. The extent to which access seekers built their own capacity to capture these rents would depend on their expectations, but, if proved correct, this would help to mitigate the impact of under-investment by the incumbent[6]. If proved wrong, the entrants' investment would exacerbate the fall in retail price below long-run marginal cost and the consequent reduction in future investment as capacity was wound back to the efficient level.

36. While this suggests the impact of third-party access on investment will be inconclusive, the ability of other firms to share the rents (positive and negative) from uncertain demand will tend to generate more and better information about the level and direction of future demands, including through the signals generated by the investment activities of entrant firms. An access regime may therefore facilitate better decision making and less drastic mis-matches between demand and capacity over time.

37. When the incumbent exercises market power and faces uncertain demand the range of possible strategies, interaction of the incumbent and entrants makes it particularly difficult to draw any in-principle conclusions about the effect of introducing an access regime. As previously, the case of perfect multi-part price discrimination is not particularly instructive if expectations are uniformly held, since it largely only introduces distributional complications to the case of efficient pricing and investment. Similarly, when the incumbent generates rents through some degree of capacity rationing, the incentives for access seekers to build their own networks will be limited by the level of the access charges and their own expectations of future demands.

38. Provided access seeker's demands for capacity are limited by their own network capacities[7] and short-run costs, the incumbent's problem is essentially unchanged from the case without an access regime. Incumbent network capacity will be set to maximise expected profits, and will lie between the extremes set by the profit-maximising capacities associated with the alternative demand outcomes. One difference with the access regime is that these profit-maximising levels of capacity are likely to be higher than if the incumbent had been able to monopolise the whole of the market. This is due to its monopolisation of the residual demand, as noted previously. Consequently, the effect of the access regime will be to reduce the incumbent's market power, and induce a higher level of total network capacity, but it will not significantly change the nature of the investment response to uncertain future demand.

[6] As long as their short-run costs are higher than the incumbent's, the capacity installed by entrants is unlikely to offset the incumbent's shortfall completely. Additional supply from entrants would increase the equilibrium quantity and reduce the extent to which price was expected to rise above the incumbent's LRMC, but some margin above this efficient long-run price must remain to offset the entrants' higher variable costs.

[7] That is, the limits of the access seekers' own short-run access to facilities and inputs, such as trained staff, that are needed to provide retail services, as distinct from the services provided by the facilities of the incumbent.

2.3. Other factors

2.3.1. Other determinants of investment

39. There are many reasons why investment will not necessarily follow the pattern suggested by changes in optimal (or profit-maximising) capacity. Some investment activity is related to the replacement or maintenance of existing facilities and capacity, so observed capital expenditure does not by itself indicate the increment to total capacity. Moreover, even the best managers taking informed and calculated decisions can commit to projects that prove to be unprofitable and inefficient investments. Not all investment will therefore prove to be efficient, or consistent with ideal or profit-maximising levels of capacity *ex post*.

40. In addition to the theoretical points determining optimal levels of capacity, decisions to invest in telecommunications infrastructure will be influenced by many other complicating, "real-world" factors, including, but not limited to:

- prevailing and expected interest rates and levels of corporate debt;
- expectations about competitors' investment and pricing plans and of the future costs of similar investments;
- the rates at which existing facilities are depreciating or becoming obsolete;
- the terms of supplier infrastructure financing; and
- taxation treatment and concessions.

41. These factors are common to all investment decisions, and the relative trend of *observed* telecommunications investment is therefore best measured by comparison with other industries. Where telecommunications investment does run above or below the trend of investment generally, some part of the difference is likely to be attributable to differences in the factors above (such as the rate of growth of demand), but also to unique industry factors, such as the regulatory environment.

42. Unlike many other sectors of the economy, technological advances (improvements in the cost and functionality of end-user equipment and the wide-spread subscription to Internet services, for instance) have driven substantial increases in the demands for telecommunications service capacity. While demands have grown, so too has technological innovation increased the capacity of existing telecommunications infrastructure to supply that demand. Although these technological developments are generally continuous, their implementation tends to occur at discrete intervals. The shift from analogue to GSM digital mobile telephone services in Australia is one example of this (together with the parallel rollout of the CDMA network in the last three years). In practice, observed levels of investment over time will therefore tend to have peaks and troughs with the effects of the introduction of new technologies and associated new capital equipment. These effects will be pronounced when comparing investment against trends in the economy as a whole. They should also become less obvious if there are larger numbers of suppliers undertaking uncoordinated investment programs than if the industry is still dominated by a single, centrally managed carrier.

43. It is therefore likely that the observed pattern of telecommunications investment relative to economy-wide investment will display a trend growth consistently above or below the aggregate and cycles reflecting major new projects and technologies and changes in the regulatory environment.

2.3.2. Investment disincentives of delay and uncertainty

44. The discussion above illustrated some of the effects of uncertain demand on the level of installed capacity and investment. As long as the incumbent and entrant firms do not make consistent errors predicting demands or costs, the effect of uncertainty is largely only to introduce fluctuations in price and capacity around long-run levels consistent with either LRMC or profit maximisation. Although the degree of uncertainty in the industry will influence the riskiness of returns and, consequently, the efficient level of capacity through its effect on the cost of capital, this will not change the qualitative effects of introducing an access regime. Opening markets to competition and allowing third-party access may increase the riskiness of investment for a previously shielded incumbent and reduce its capital expenditures[8].. Deregulation *per se* will not, however, necessarily prevent efficient investment.

45. Investments in telecommunications infrastructure tend to be substantially sunk. That is, most of the capital expenditure cannot be recovered if the investor ceases servicing a part of the market or leaves the industry. It is generally accepted that this can create barriers to entry, but the irreversibility of some expenditure can also create a barrier to otherwise apparently efficient investment[9]. When the expenditure cannot be recovered, there is an option value to delaying a commitment to invest, since the cost of delay can be offset by the potential for savings as better information becomes available about whether the sunk investment will earn an appropriate return. This is particularly important when there is uncertainty about market conditions, such as levels of demand, competitors' responses or access prices, for instance.

46. Consequently, there will be disincentives for entrants to invest when regulatory processes create delays and uncertainty about the eventual cost of access to existing facilities – especially when there is sufficient existing capacity on these facilities to accommodate all players. Even if there are large monopoly rents available to entrants who build their own facilities to avoid excessively high access and interconnection charges, the irreversibility of those investments will deter expenditure if the uncertainty will be reduced in time. When faced with uncertainty of the sort discussed in Sections 2.1.2 and 2.2.2 above, firms will tend to invest less than simple expected value calculations would suggest, holding off some of the irreversible expenditure until the returns are clearer.

47. Again, however, this does not change the direction of the impact on investment of introducing an access regime, only the level and timing of the response. It does suggest that an access regime that draws out the processes of negotiating prices and terms will tend to stifle investment more than one that allows a quick decision. Both incumbent and access seekers will have incentives to delay investment decisions while the outcomes of regulatory processes are unclear.

48. The option value of delay also has implications for the appropriate level of access charges. Unless this is incorporated into the estimates of the forward-looking cost of capacity, charges may understate the cost of providing access as seen by the incumbent, and

[8] Indeed, it could be argued that a monopolist may actually have incentives to over-invest if it employs multi-part prices and enjoys a margin below commercial interest rates because of the certainty of its cashflows associated with its monopoly position.

[9] See, for instance, A. Dixit and R. Pindyck, *Investment Under Uncertainty*, Princeton University Press, Princeton, New Jersey, 1994, particularly Chapter 8. Note that the same value of delay applies to decisions to enter and exit markets and suggests prices can consequently fluctuate in competitive markets in a range wider than predicted by conventional microeconomic theory.

create an incentive to under-invest. Conversely, access charges may have to be well above the incremental costs of building new capacity before entrants will build their own facilities. They will have incentives to seek access to existing facilities if the price of access is above the forward-looking cost of building their own facilities by less than the option value margin created by uncertainty. The danger for regulators setting or mediating access prices is that the prices fall below what the incumbent views as reasonable recompense for the risk of investing, but not sufficiently above the costs to entrants of building new facilities to induce them to do so.

2.3.3. Influence of USO processes

49. Prior to the introduction of an access regime, an incumbent may have sustained low capacity and high retail prices in parts of its network as a source of cross-subsidy to other parts of the network in which it had an obligation to maintain services at prices below cost. If this obligation remains without alternative sources of funding, the profitability, and possibly the viability, of the incumbent will be threatened. This possibility may also be used as leverage by the incumbent to resist pressures to allow competition for its markets and access to the services of its facilities. Moreover, the withdrawal or reduction of funding for the cross-subsidy (or other changes which allow the incumbent to concentrate on supplying services to more profitable regions) will lead to reduced investment in regional areas as the network capacity is reduced. While this may possibly be efficient in light of the balance of costs and demands in the region, it may also reflect an attempt to maximise the returns from its monopoly provision of subsidised services when the agencies funding continued subsidies are not able properly to monitor and enforce the quality of those services.

50. Telstra claims that it is unable to sustain the necessary level of infrastructure remote areas because "there are no uncontested markets to cross-subsidise investments in uneconomic areas"[10]. Clearly, provision in USO areas should not rely on subsidies from other regions, other than those made available through the USO mechanisms. While Telstra may have been able to separate network design and maintenance from cost recovery in the past (and indeed was explicitly prohibited from linking these decisions), there has been a significant period in which it should have adapted to a regime which unravels operating and capital cross-subsidies, and puts operations in all areas on a commercial footing (allowing for the USO contributions and pricing restrictions).

51. Left without external contributions, the efficient response may be for Telstra to allow existing capacity to degrade until it withdraws from these high-cost areas. There is, however, a clear political commitment to ensure minimum standards of services in net cost areas, so the relevant question is whether the subsidy is sufficient to sustain services. This is an issue beyond the focus of this paper, and the answer hinges on the level of competition that emerges for the rights to service various areas once the subsidy is made more generally available. This, in turn, depends on the prices entrants will be charged to utilise existing Telstra facilities. The important point to note therefore is that access and interconnection issues are still paramount in determining the level of investment in telecommunications facilities in subsidised regional areas. As the incumbent, Telstra still has clear incentives to overstate the cost of infrastructure, both historical and future investments, and to obtain the highest possible price for access.

[10] Bruce Akhurst, Telstra group managing director of legal and regulatory, on page 6B of the transcript of proceedings of the Inquiry in Sydney on Monday 14 August.

2.3.4. Appropriate access pricing encourages efficient investment

52. As noted above, forcing the incumbent to provide third-party access will reduce its monopoly power and reverse some of the incentives to monopolise the market. The introduction of an access regime *per se* should not lead to inefficient levels and distributions of investment, but the price set or negotiated will play an important part in determining its consequences. The relevant question then is not whether an access regime affects levels of investment, but whether the processes of the regime lead to appropriate prices for access and interconnection.

53. In its June 2000 Draft Report, the Ministerial Inquiry into Telecommunications in New Zealand notes that:

> *In shaping its recommendations, the Inquiry has also been guided by the view that competition driven by new and innovative investments in alternative electronic communications facilities – rather than by mandated access to existing facilities – offers the greater potential to meet the Government's objective. Thus, the Inquiry considers that it is critical that the regulatory environment preserves incentives for efficient investment in the sector.*[11]

54. While this approach has merit, and the development of alternative networks based on new technologies is an important source of competition for existing telecommunications suppliers, it does not address the fundamental constraint on entrants – that they must have some degree of interconnection with legacy networks to assure their customers of any-to-any connectivity. Indeed, in the final report of the New Zealand Inquiry this point receives more emphasis than the power of greenfield networks to put competitive pressure on an incumbent. Without access at some point in competitors' networks, entrants are restricted to markets for stand-alone networks (such as company intranets) or for providing wholesale services to retail suppliers with access agreements. Serving these markets may be lucrative, especially in the early years of deregulation, but it does not provide the same opportunities or competitive pressure that will emerge if the new networks can supply existing firms' markets.

55. Efficient investment occurs when capital expenditure leads to services being provided at lowest cost (the total surplus maximising solution). Therefore, access seekers should only invest if they can then supply services through their own facilities at lower prices (generating higher surplus) than if the capital or intermediate inputs were purchased. While there is some element of trade-off when a market is first deregulated between productive efficiency and encouraging investment by entrants to reinforce their presence, the long-term objectives of opening markets to competition should include only encouraging investment intended to serve current or expected needs not met by existing facilities.

56. An appropriate access regime should therefore ensure that the price of access to facilities does not encourage access seekers to build facilities when, appropriately priced, they could supply services at lower social cost by using other wholesaler's facilities. That is, the regime should not encourage the construction of new facilities where existing facilities have sufficient capacity to serve the demands generated by entrants at prices close to the long-run marginal (capital and variable) costs of supply. Moreover, the use of *existing* facilities should be encouraged where this is feasible, and access should not be restricted where this serves only to bolster an incumbent's market position, at the expense of the productive efficiency of its network.

[11] Ministerial Inquiry into Telecommunications, *Draft Report*, Website: http://www.teleinquiry.govt.nz, June 2000.

57. This point is included in the LTIE test, as specified in Part 152 of the TPA. Part 152AB(2) includes "(e) the objective of encouraging the economically efficient *use of*, and the economically efficient investment in, the infrastructure by which listed services are supplied" (emphasis added) as one of the three criteria to which regard must be had in determining whether a particular thing promotes the long-term interests of end-users. This is further qualified in Part 152AB(6) to require regard for:

> (a) technical feasibility;
>
> (b) the legitimate commercial interests of the supplier or suppliers of the services, including the ability of the supplier or suppliers to exploit economies of scale and scope; and
>
> (c) the incentives for investment in the infrastructure by which the services are supplied.

58. As the firm with the oldest network, Telstra has the strongest incentive to ensure that access charges include the largest possible allowance for historical costs. It has argued that basing access charges on forward-looking costs alone will not yield access fees that will sustain long-term investments. While there is an element of truth in this, and access fees in other industries have been set with reference to reasonable rates of return on sunk investments, the onus of proof of the cost of necessary infrastructure needs to fall on Telstra. If access is granted to networks at prices based only on forward-looking costs, the rate of technological development in telecommunications almost certainly means that some allowance must be made for historical costs when setting access charges. This is appropriately done through adjustment to the Weighted Average Cost of Capital (WACC) included in the assessment of the access charges. Nevertheless, one important reason for adopting forward-looking costs is to avoid the asymmetry that arises from reliance on the incumbent for information about historical cost, and the potential for this to be manipulated.

59. Telstra has also argued for access prices that reflect actual costs, rather than the forward-looking optimised network costs embodied in TSLRIC. This is not the same as arguing (as it has in other instances) that the forward-looking access costs assessed by the ACCC are too high. Rather, it implies that the costs actually incurred by the incumbent should be factored into the calculation of access charges. This is consistent with Telstra's past endorsement of the Efficient Component Pricing (Baumol-Willig) Rule (ECPR) as the appropriate basis for assessment of access and interconnection charges.

60. There is a case for making some allowance for historical costs to ensure that access charges compensate the incumbent for the technological risk inherent in sinking capital into facilities when the there is an expectation that future costs will decrease. Nevertheless, as noted in Section 2.2.1, changing the basis for access prices to ECPR would compensate Telstra for all of the lost revenue from providing interconnect, and would almost completely stifle competitive entry. As the discussion in Section 2 makes also clear, the incumbent will not have incentives to invest efficiently if it retains some element of market power after the access regime is introduced. Setting access prices to compensate for actual or historical capital expenditure will not therefore encourage efficient investment. The forward-looking, efficient network basis of TSLRIC is intended to provide efficient price signals to both entrants and Telstra. There are obvious incentive problems associated with compensating Telstra for all of its investment costs, and TSLRIC puts the onus on it to ensure that it minimises the costs of expanding its network capacity, and designs that capacity to be consistent with wholesale as well as retail service provision.

61. High access and interconnect prices have opposing effects on entrants' incentives to build alternative networks. While the high cost of access to existing facilities will increase the desirability of operating a lower cost network of their own, entrants must eventually connect to the incumbent network and the prospect of losing any cost advantages of their own networks in establishing interconnection will deter investment. It is not clear therefore that high access and interconnection prices will automatically lead to the development of alternative facilities-based competitors. Without interconnection rights, entrants would have to reproduce the *whole* of the incumbent network to obtain comparable coverage, and even then would not be guarantied to attract customers without an arrangement that avoided duplication of equipment in the customers' premises

62. Consequently, while access to existing facilities (for long-distance transmission, say) allows entrants to build their own market niches and customer bases, the price (including the terms and conditions) of interconnection is the keystone which locks together the entrant's offer. An entrant who builds a cost minimising network with a combination of their own facilities and wholesale services purchased from the incumbent, still risks being unable to compete in retail markets if the price of interconnect is set too high.

2.3.5. Effects of declaring "competitive" wholesale services

63. Optus has argued[12] that the ACCC has declared services in competitive markets (inter-capital city transmission services, analogue broadband cable TV carriage, GSM and AMPS mobile originating and terminating services, with the conclusion that: "This has served no useful purpose, created needless uncertainty and regulatory costs, and lowered investment.". Optus has also argued that de-centralised markets have strong incentives to allow mutual connectivity, and that regulated interconnection may, by virtue of the limits of regulatory processes, actually impede the efficiency of the market outcomes.

64. To conclude that declaration of "competitive" wholesale markets is inefficient it must be presumed that the access regime is biased in favour of access seekers, and will always under-price access. Although declaration would introduce an element of uncertainty into a mature and stable wholesale market, it should have little effect in the first instance if price, terms and conditions have all previously been negotiated. Access seekers might have some incentive to seek a better deal through notification of a dispute and eventual ACCC rulings, but this would come at the cost of substantial delay and, if the market is well established, the rulings would likely be based on established contracts. The parties would then still have to renegotiate the details of any agreement. Access seekers would therefore gain an advantage only if it was practically certain that the ACCC's eventual assessment and declaration would be biased downward.

65. In the absence of any evidence that the ACCC's assessment processes are biased towards inefficiently low access charges, there is no in-principle barrier to it declaring all types of wholesale services. This would not impede or supplant the commercial arrangements that have already been established, nor would it necessarily bias the negotiations that would have occurred otherwise.

[12] Submission 8 to the Inquiry, updated 29/8/2000, at paragraph 3.74.

3. Recent telecommunications investment

66. The submissions to this Inquiry include many claims about the investment impact of the 1997 telecommunications regulatory regime, most of which are not backed by substantive quantitative evidence. A detailed assessment of the impact of the 1997 regime is hampered by the absence of consolidated sources of information about the state of the telecommunications industry, including about the services delivered, turnover earned and the extent and nature of the networks established by the various participants. Regulatory sources are particularly weak[13]. The ACCC has various information gathering powers, particularly under Part XIB of the TPA, but these do not appear have been used to gather any industry-wide telecommunications market data, and certainly none that has been consolidated and published.

67. The availability of data on aggregate investment levels and composition is also poor. Carriers must lodge industry development plans with the Department of Communications, Information Technology and the Arts (DoCITA), and there is a requirement that a version of these plans should be made available to the public, but the content of these reports is generally only descriptive and they provide little detail about what capital expenditure is planned by the carriers, or its value, location or timing.

68. Note, however, that this problem is not unusual in international experience. Detailed data on telecommunications-specific investment also does not appear to be widely available for other countries. Only the United States' Federal Communications Commission (FCC) produces detailed statistics about the nature of telecommunications investment. These data are briefly examined at the end of this Section.

69. Australian sources examined in this Section are an Australian Bureau of Statistics (ABS) series on telecommunications-related construction investment, information drawn from Access Economics' own *Investment Monitor* database, and the capital expenditure information published in Telstra's Annual Reports.

3.1. ABS construction data

70. The Australian Bureau of Statistics' publication *Engineering Construction Expenditure, Australia* (Cat. No. 8762.0) contains data on telecommunications construction investment expenditure, broadly defined to include Television, Radio and Radar facilities. These activities are generally beyond the scope of the inquiry by the Productivity Commission and, although the ABS series contains more detailed information than shown here, we have been advised that it is not possible to isolate the more relevant telecommunications components.

71. Despite the high level of aggregation, the ABS data give a good indication of the pattern of telecommunications investment spending before and after July 1997. Nevertheless, some judgement and additional information are needed before changes in the trend can be ascribed directly to specific parts of the telecommunications regulatory regime, or particular regulatory decisions.

72. Table 3-1 shows the ABS data on levels of public, private and total construction investment in telecommunications between 1990-91 and 1999-00, disaggregated by States and Territories. Note that all figures are in millions of current dollars (not adjusted for

[13] For instance, the Department of Communications, Information Technology and the Arts' "Industry Analysis" web page has not been updated since April 1998 and although the "Statistical Compendium" page was last updated in August 1998, most of the data series it contains end in 1996-97.

inflation), and that the figures for 1999-00 are for the first three quarters only. All "Work to be done" is as at March 2000.

Table 3-1: Construction investment in telecommunications, $ million

Public sector

	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00*	To be done
NSW	714	620	697	526	734	863	1034	1115	1159	940	9
VIC	721	442	395	323	489	600	651	638	677	454	1
QLD	365	304	307	394	482	544	582	680	725	694	0
SA	181	139	122	123	158	123	71	54	79	136	0
WA	193	193	163	154	209	347	148	87	98	193	0
TAS	20	14	28	29	52	55	57	57	46	37	0
NT	34	28	25	25	32	25	14	13	18	29	0
ACT	37	30	34	25	35	42	52	59	69	50	1
Total	2265	1771	1771	1600	2190	2600	2609	2703	2870	2533	10

Private sector

	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00*	To be done
NSW	8	10	27	53	30	58	70	30	25	137	95
VIC	2	4	26	37	26	57	57	38	81	63	75
QLD	3	3	11	3	7	16	38	7	8	67	70
SA	0	1	9	13	8	6	1	6	2	5	2
WA	15	20	8	1	11	81	8	14	4	10	1
TAS	0	0	0	3	2	1	0	0	0	1	0
NT	2	0	0	1	0	1	0	3	5	1	0
ACT	0	0	11	3	0	0	0	0	0	0	1
Total	30	38	92	114	85	220	173	99	125	284	243

Total

	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00*	To be done
NSW	722	630	724	579	763	921	1104	1145	1184	1076	103
VIC	723	446	421	360	515	656	707	677	759	516	76
QLD	367	307	318	398	489	560	620	687	733	761	70
SA	182	140	131	136	166	129	71	60	80	141	2
WA	208	213	171	155	220	429	156	101	102	204	1
TAS	20	14	28	32	54	56	57	57	46	38	0
NT	36	28	25	26	33	26	15	16	23	30	0
ACT	37	30	45	28	35	42	52	59	69	51	1
Total	2294	1808	1864	1713	2275	2820	2783	2801	2995	2817	253

* Only the first three quarters of 1999-00 are included in these figures.

73. Allowing for the part reporting of 1999-00, Table 3-1 shows consistent growth in total telecommunications-related construction expenditure since 1993-94 which is generally, although unevenly, reflected in the experience in each of the States. Private sector expenditure is particularly unevenly distributed across the States, and Western Australia in particular has a disproportionately high level of private telecommunications investment. Although not evident in the States' series, there are two distinct periods of growth in the Australian total, corresponding to the years 1993-94 to 1995-96 and 1997-98 to the present (again allowing for the part reporting of 1999-00).

74. Table 3-2 summarises the total levels of telecommunications construction investment, and shows the disaggregation of work between the public and private sectors, highlighting the work undertaken for or by the public sector (including Telstra). The bulk (more than 90 per cent in all years) investment is by and for public corporations, but there has been substantially faster growth in the level of private expenditure over the period shown. This possibly reflects the greater opportunities afforded by telecommunications deregulation and technological changes that have encouraged private firms to establish their own telecommunications facilities, either for their own use or as part of a carrier network. That is, it is possible that the introduction of the 1997 telecommunications regime has generated

additional investment by retail telecommunications customers, independently of the effect on carriers and their wholesale customers.

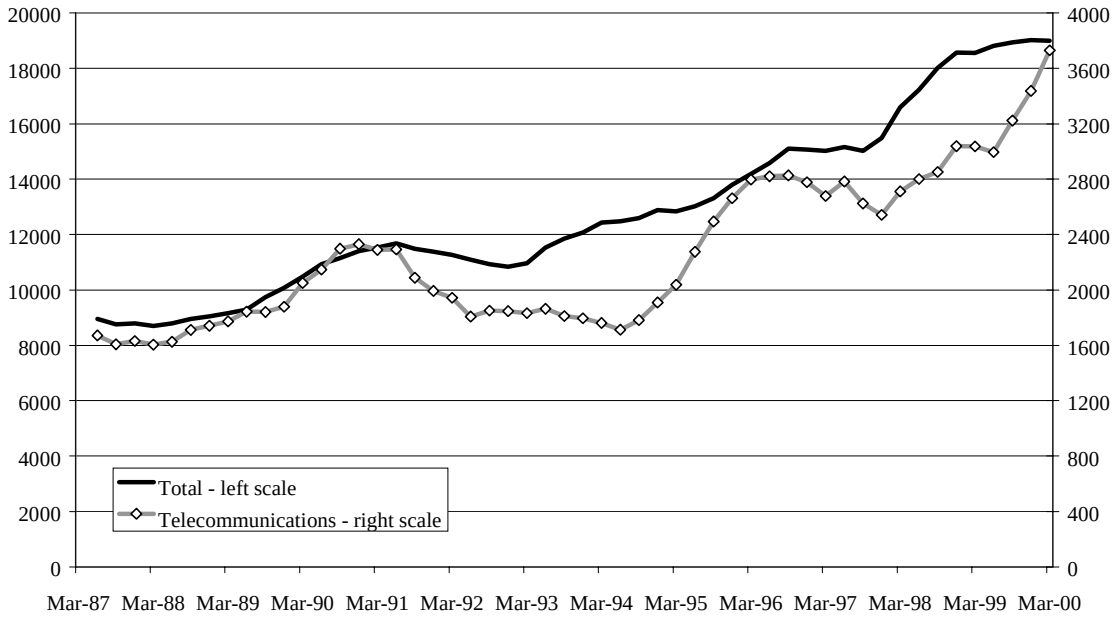
Table 3-2: Telecommunications construction investment by sectors, $ million

	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00*	To be done
Public sector *by*											
Total	2265	1771	1771	1600	2190	2600	2609	2703	2870	2533	10
Private sector *for*											
Public	21	31	23	31	12	26	7	32	20	69	25
Private	9	7	70	83	73	194	166	67	105	215	218
Total	30	38	92	114	85	220	173	99	125	284	243
Total	2294	1808	1864	1713	2275	2820	2783	2801	2995	2817	253
Work for the public sector (by private and public sectors)											
Total	2285	1802	1794	1630	2202	2626	2617	2735	2891	2602	35

* Only the first three quarters of 1999-00 are included in these figures.

75. Figure 3-1 puts telecommunications construction investment expenditure in the context of all similar expenditure across all industry categories. While the telecommunications share is the same at the beginning and end of the period, it has been substantially below the trend of the total for most of the period since 1991. The fluctuation around the total is consistent with investment reacting to industry-specific factors, although it is notable that, despite the opening of the market, telecommunications construction investment has generally stayed below the total trend. The two growth periods noted earlier (between 1993-94 and 1995-96, and 1997-98 to the present) are again evident, although the timing is altered by the quarterly observations. Construction investment clearly slowed slightly over the two years to June 1994 before returning to trend levels by March 1996, then slowed again until March 1998, after which there was a second period of high growth back to the economy-wide trend.

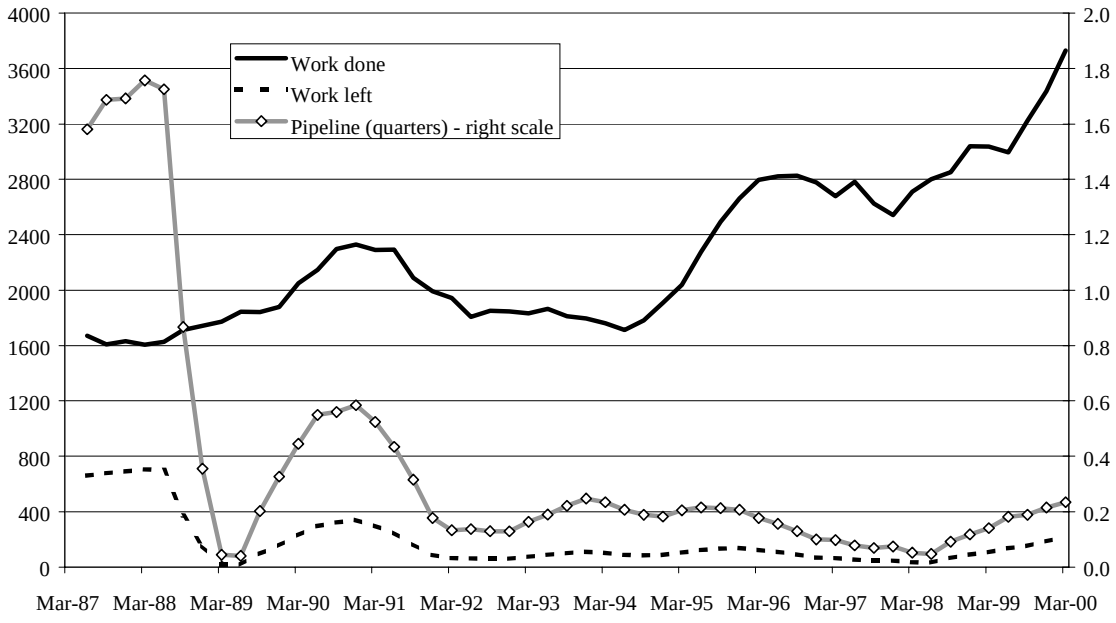
Figure 3-1: Construction investment, 1987 to 2000, $ million



76. These growth periods do not correspond directly to any particular regulatory changes in the telecommunications industry, although the second may be a delayed response to the start of the 1997 telecommunications regime, especially given the initial uncertainty surrounding the operation of the access regime and the slow initial progress in establishing how the regime would be interpreted and implemented by the ACCC. The pattern shown is consistent with a slowing as investment plans were delayed pending the introduction and implementation of the new regime.

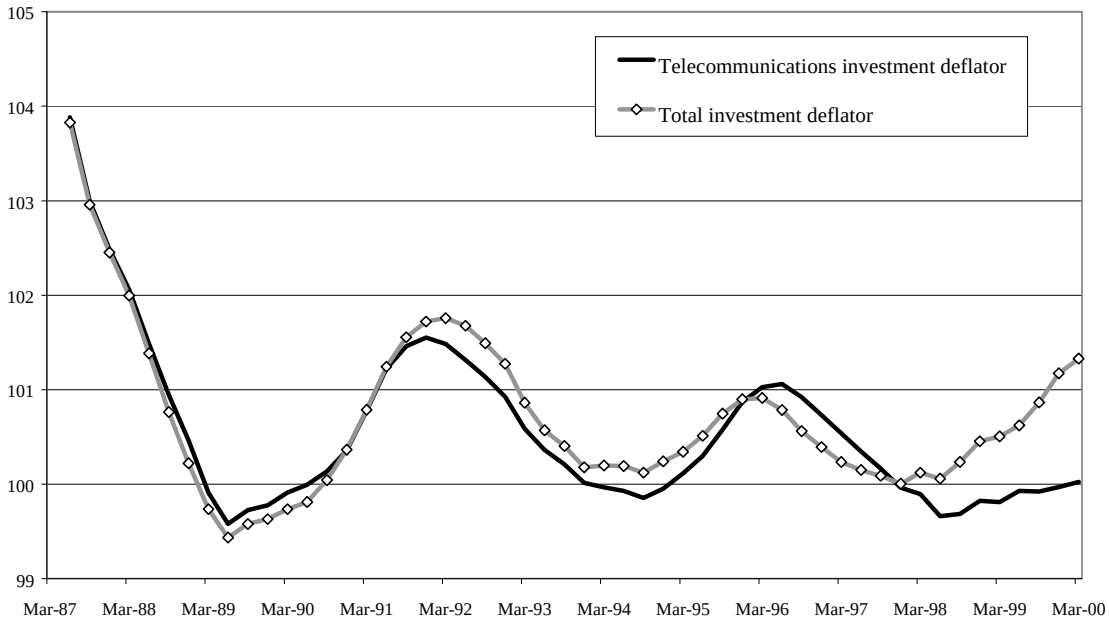
77. Figure 3-2 shows work left, work done and the pipeline ratio of work left to work done. This ratio estimates how long the current work remaining will take to complete (given the current rate of completion). A value below 1.0 indicates that the work is basically being completed in the quarter with new work required constantly to prevent construction investment levels dropping. Since 1988, and more consistently since 1992, the telecommunications sector has clearly operated on a relatively short advance timeframe. There does not appear to have been any significant change in this since the introduction of the 1997 regime.

Figure 3-2: Telecommunications construction investment, 1987 to 2000, $ million



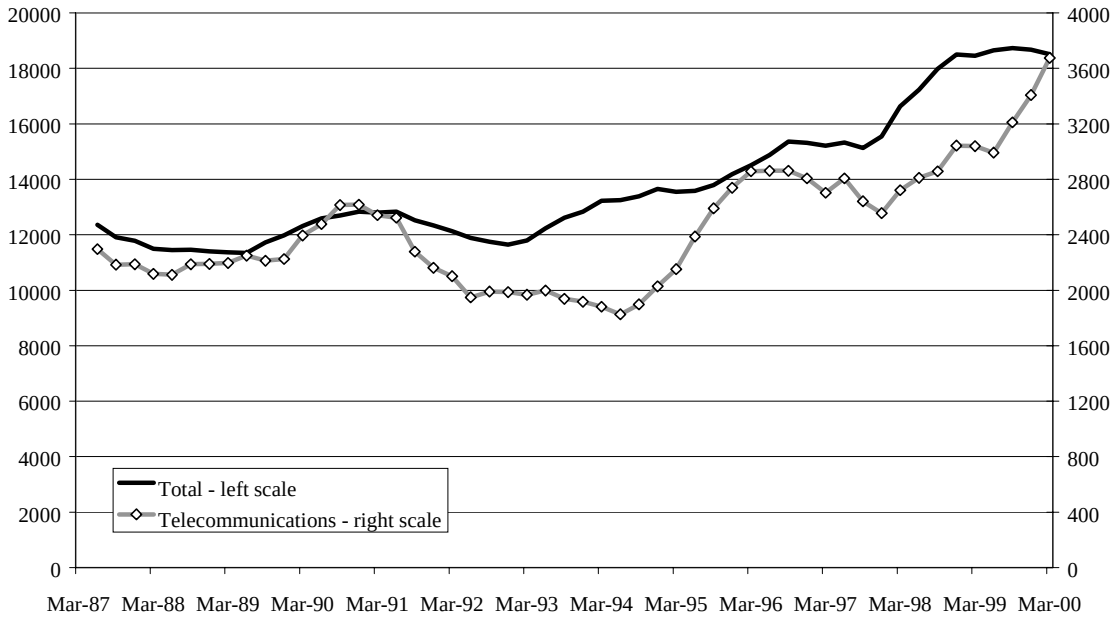
78. The relative movements in telecommunications to total construction investment maybe due in part to movements in relative prices. However, as Figure 3-3 shows, the two associated price deflator series move closely together until around the beginning of 1998, when the relative cost of other investment rose substantially. That is, the lower relative cost of telecommunications construction investment may have stimulated part of the recent faster growth, but there is no similar relative price change to explain the similarly-sized fluctuations in previous years.

Figure 3-3: Construction investment prices relative to national output deflator



79. Figure 3-4 uses the deflator series above to show real movements in total and telecommunications construction investment. As before, the telecommunications share of the total investment remains relatively constant over the period, but lies below trend from around 1991 onwards. The two periods of accelerated telecommunications construction investment note above are also preserved.

Figure 3-4: Real construction investment in Australia (year to) $1997-98 million



3.2. Access Economics' *Investment Monitor* data

80. Access Economics produces its own investment series (published for subscribers as *Investment Monitor* (IM)). The series is based on data collected from a variety of private

sources and State and Federal government departments about investment projects with individual values over $5 million. Much of the information is drawn from lists prepared by others and all the data may not be on a consistent basis, but, where possible, we check major projects with the relevant company. The Australian projects included cover manufacturing, transport, communications, mining, power, water, forestry and agriculture. The survey encompasses public and private sector economic infrastructure projects, including large defence projects (submarines and frigates, for instance).

81. We have extracted a telecommunications investment series from our IM database. While not as comprehensive as the ABS series discussed above, the IM data has higher levels of detail on projects which account for about half of the value of activity measured by the ABS series, and closely follows its trends. It therefore provides insight into some of the broad trends in the timing of telecommunications-specific capital expenditure and investment plans not apparent from the data summarised in Section 3.1.

82. The extract of telecommunications-related projects from the IM database covers 178 individual projects either planned or completed over the period from the September quarter 1996 to the June quarter 2006, and totaling $27.8 billion. The projects have been loosely divided into four categories:

- *Private telecommunications*: projects apparently undertaken primarily to provide telecommunications services for the internal use of (public or private sector) organisations;
- *Carrier and wholesale telecommunications*: telecommunications infrastructure and supporting projects undertaken by telecommunications and other companies primarily to provide wholesale or retail telecommunications services;
- *Private IT and telecommunications software*: information technology and software projects, such as web site development and WAP content development, undertaken primarily for the internal use of the relevant organisations; and
- *Year 2000*: computer software or hardware projects related to remediation of the Y2K problem.

83. The annual investment in these categories and in total is summarised in Table 3-3, and is further divided between the value of projects actually completed in each financial year to date and the value expected to be completed in future years. This latter value obviously diminishes as the planning horizon gets longer. The series is dominated by the large value ($4,455 million) of carrier and wholesale telecommunications work completed in 1997-98, most of which is due to the substantial completion of Telstra's and Optus' broadband network rollouts.

Table 3-3: Summary of telecommunications project values, $ million

	Work completed				Work planned at June 2000					
	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
Private telecommunications	881	1,337	2,866	2,605	385	392	83	42	10	2
Carrier and wholesale telecommunications	1,233	4,455	1,045	1,716	4,940	208	130	63	10	5
Private IT and telecommunications software	-	3	12	28	151	151	94	11	-	-
Year 2000	633	1,481	1,836	967	-	-	-	-	-	-
Total	2,747	7,277	5,759	5,316	5,476	751	308	115	20	7

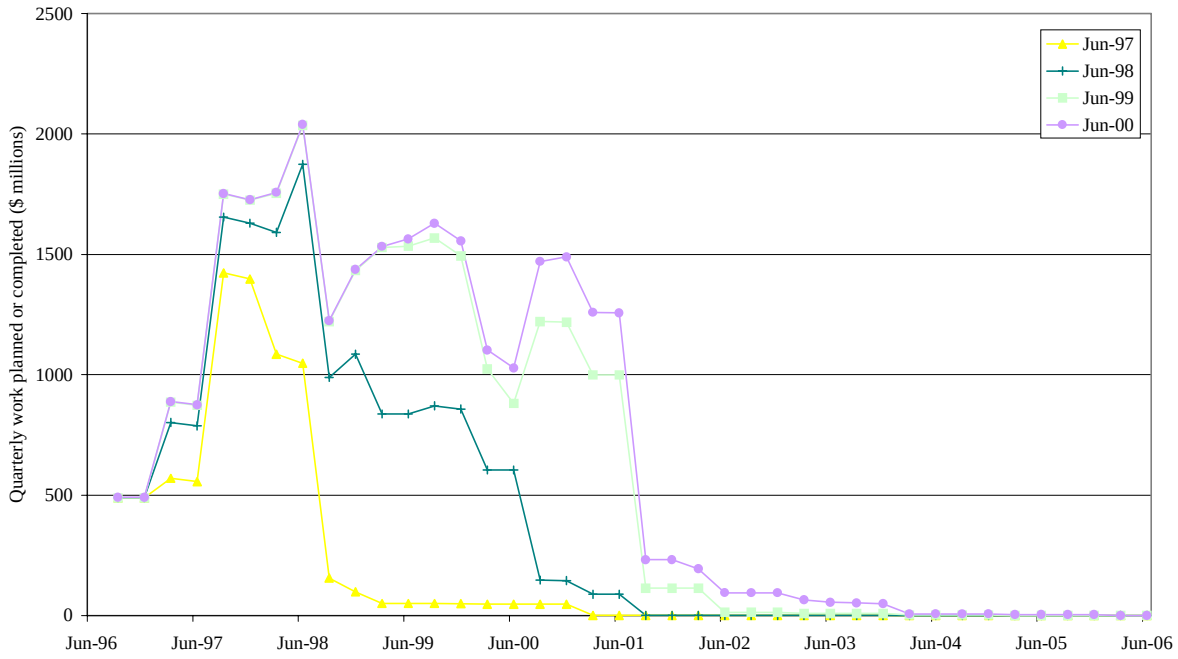
Source: Access Economics' *Invesment Monitor* project database

84. The following Figures illustrate the time profiles associated with the annual totals in Table 3-3, together with the changing pattern of proposed investment. Each series illustrates completed or planned work before and after the relevant date. For example, the June 1998

series shows the quarterly work completed on relevant projects up to June 1998, and the forecasts of planned quarterly expenditure thereafter. Consequently, the series follow one another where they share a common history, and diverge where, at the time, more or less investment was forecast for the future. The changes in the level and timing of future work are therefore evident from the extent to which the completed and forecast parts of the series diverge.

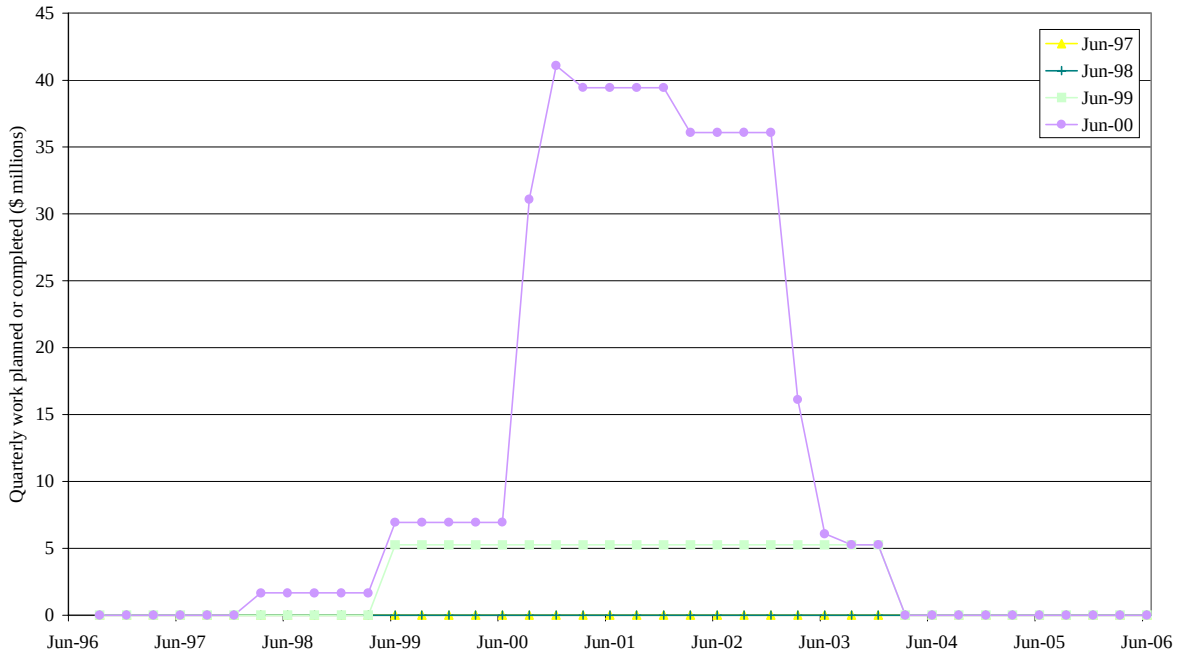
85. The general pattern in total telecommunications-related capital expenditure shown in Figure 3-5 is of a substantial increase in planned and completed investment between June 1997 and June 1998, another, smaller, increase between June 1998 and June 1999, and a smaller increase in the following year. This is consistent with the shortening of the planning horizon observed in the ABS construction data and suggests a slowing of commitment to new projects, although the level of completed works still runs at between $1.0 billion and $1.5 billion per quarter. A slightly different pattern emerges when the component series are examined separately.

Figure 3-5: Total telecommunications investment planned or completed, $ million



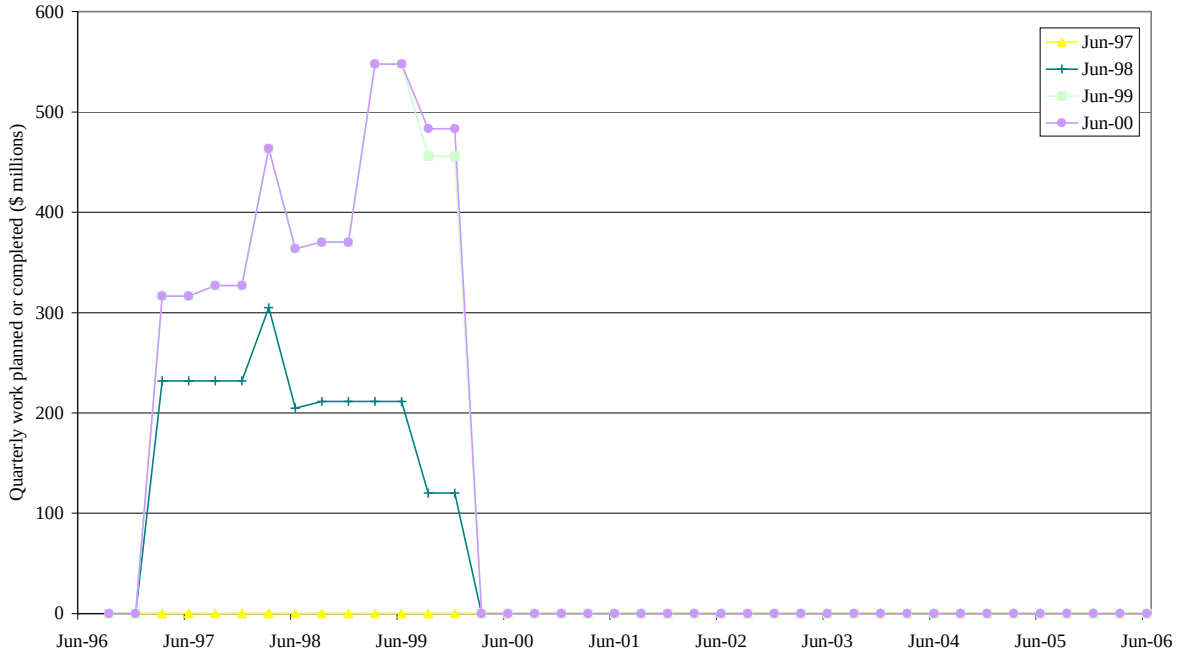
86. As shown in Figure 3-6, actual and planned private information technology and telecommunications software projects have grown steadily since 1997. Despite a substantial expected growth in expenditure in the next two years, the scale of expenditure in this category remains relatively small compared with infrastructure investments.

Figure 3-6: Private IT and telecommunications software projects, $ million



87. Although relatively substantial at the time, expenditures on projects related to the Year 2000 problem have ceased. Figure 3-7 shows observed plans for these expenditures increased from nothing in June 1997 to over $200 million per quarter of completed and proposed works through 1997 and 1998. This grew further to over $400 million per quarter during 1999, before falling to zero, as might be expected, at the beginning of 2000.

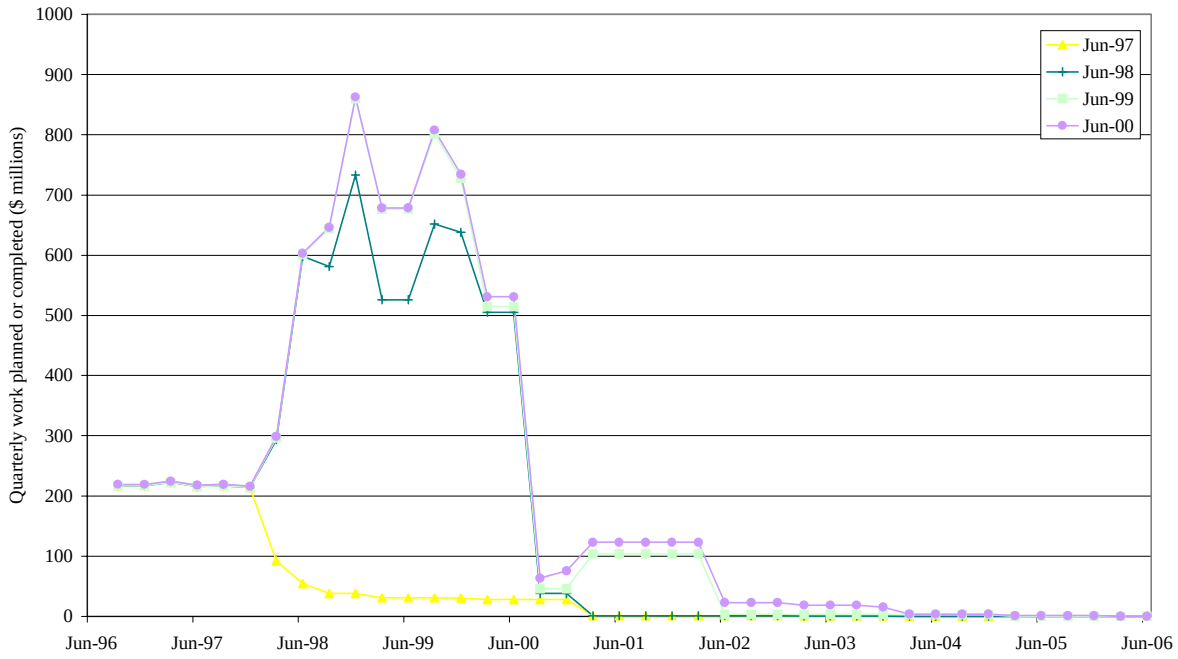
Figure 3-7: Year 2000 projects, $ million



88. Figure 3-8 shows a substantial increase in completed and projected private telecommunications projects in June 1998, compared with the expectations in June 1997.

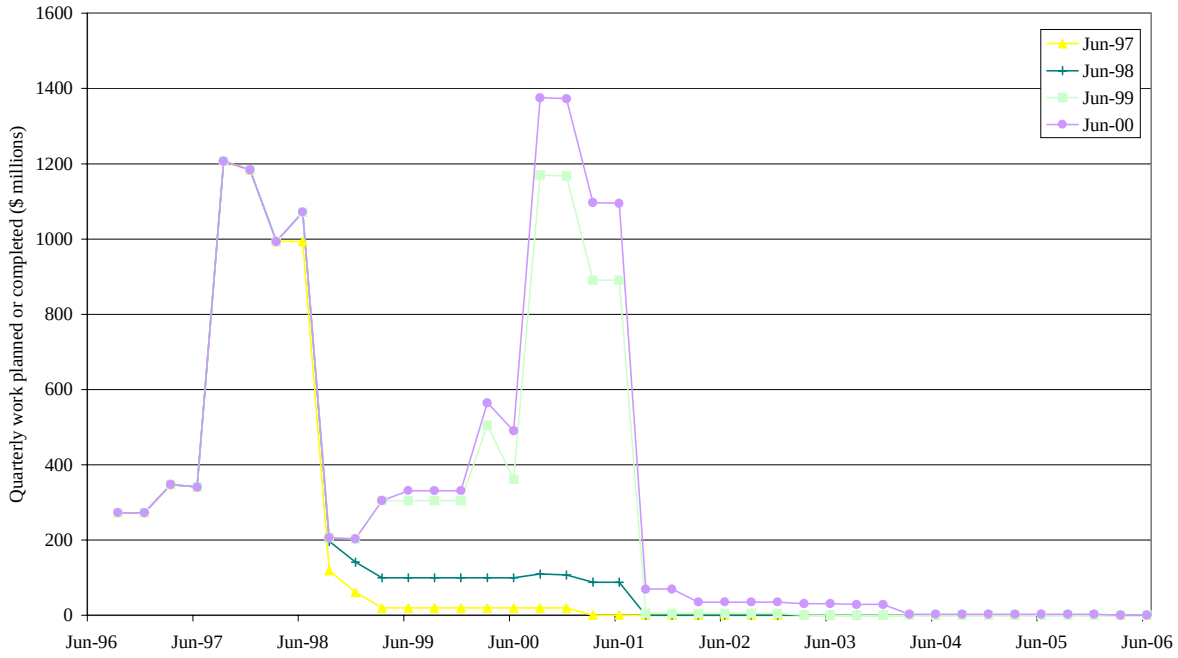
Instead of falling from $220 million to around $30 million per quarter, completed works increased to $600 million per quarter and were expected to remain at around that level for the following two years. This expectation was exceeded by the completed works reported in June 1998, although the forecast for a drop in the level of investment past the end of 2000 was only marginally boosted by projects worth around $110 million per quarter after the beginning of 2001. That is, there was a substantial increase in actual and forecast private telecommunications investment over 1997-98 which was expected to be sustained over the next two years. While this expectation was fulfilled, our series suggests this level was not, in June 1999, planned to be sustained, and continues not to be. There appears to have been a sudden and largely unforeseen burst of telecommunications-related investment by private firms in 1997-98 to take advantage of some of the opportunities opened by deregulation but, once these facilities were in place, no sustained increase in these expenditures. Again, however, this may be a reflection of a shortening of the planning (or announcement) horizon for new infrastructure spending, and spending at the higher level may eventually be sustained.

Figure 3-8: Private telecommunications projects, $ million



89. The last series, carrier and wholesale telecommunications investment presented in Figure 3-9, is expenditure that is most likely to be affected by the design and implementation of the 1997 telecommunications regulation regime. It also constitutes the bulk of current and expected capital spending. Compared with the private telecommunications series, it displays no unexpected increase in investment in 1997-98, although there was an initial round of increased expenditure (from around $300 million per quarter to over $1,000 million per quarter) in the year after September 1997, followed by a return to pre-1997 levels. This was followed by steady increases in actual and planned expenditure into 1999-00 and 2000-01. Although quarterly expenditure of around $1,000 million is expected in the year from September 2000, no new work of a similar magnitude is expected thereafter.

Figure 3-9: Carrier and wholesale telecommunications projects, $ million



90. Although these series are incomplete measures of investment in the telecommunications sector, the general pattern of expenditure is consistent with the ABS construction series, and suggests that the introduction of the 1997 regime led to substantial initial investment in telecommunications facilities for both firms' own uses and as part of carriers' networks. This expenditure was not sustained through 1998-99, but now appears to be growing again, above the levels observed prior to 1997. The data is therefore consistent with the new regime creating opportunities for new investment almost immediately and, with some delay, higher levels of investment into the future.

3.3. Telstra's recent investment experience

91. As the incumbent supplier, an examination of Telstra's recent investment experience is also instructive. Table 3-4 shows Telstra's capital expenditure since 1994-95, and details of the distribution across the various components of its network, as outlined in its Annual Reports.

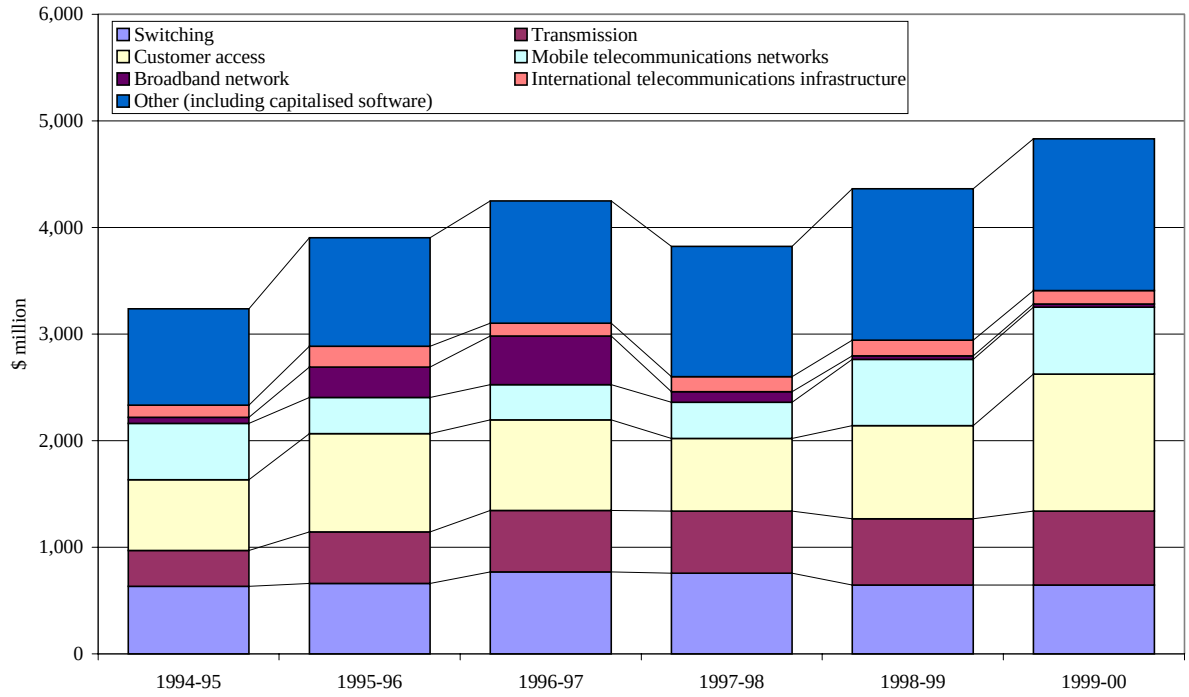
Table 3-4: Telstra's capital expenditure, 1994-95 to 1999-00, $ million

	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00
Switching	634	659	768	756	644	647
Transmission	335	486	579	584	624	693
Customer access	666	920	848	681	873	1,285
Mobile telecommunications networks	526	342	330	340	621	628
Broadband network	60	282	459	97	34	30
International telecommunications infrastructure	112	197	119	143	146	125
Other (including capitalised software)	905	1,018	1,145	1,223	1,424	1,422
Sub total capital expenditure	3,238	3,904	4,354 [a]	3,824	4,366	4,830
Capitalised interest included in above	0	0	-106	-83	-92	-125
Capital expenditure excluding capitalised interest	3,238	3,904	4,248	3,741	4,274	4,705

Sources: Telstra Annual Reports: 1996-97, page 41; 1997-98, page 55; 1998-99, page 91; 1999-00 page 23.
Note: (a) Includes $106 million in capitalised interest not shown in figures above.

92. There is no indication in these figures that the introduction of the 1997 telecommunications competition and access regime has substantially impeded Telstra's investment program. The variations are consistent with the fluctuations that might occur as a consequence of the timing of the building of new networks and introducing new technologies, and there is an upward trend at a rate which is sufficient to ensure that expenditure has increased in real terms.

Figure 3-10: Telstra's capital expenditure, 1994-95 to 1999-00, $ million



93. The dip in total expenditure in 1997-98 was associated with the completion of several large projects, including the digitsation and upgrading of the PSTN and Telstra's broadband network. Of these, the broadband network was a significant investment in a new network technology, the timing of which is likely to have been influenced by competitive and regulatory factors. In particular, it was a response to the roll-out of Optus' own broadband network and took place under the pre-1997 regulatory regime in which the (duopoly) carriers had greater freedom of access to property and rights of way than are allowed for under the present regime. By themselves, the changes to carriers' access to property and rights of way under the 1997 telecommunications regulatory regime will have increased the costs of installing and maintaining network facilities, and should have decreased investment as a consequence.

94. Telstra has changed the composition of its capital works, primarily through growth in expenditure on customer access, transmission and software, and does not appear to have held back its investment program substantially as a consequence of the new telecommunications regulatory regime. Although it is not clear what additional spending may have been committed in the absence of the regime, the observed pattern is consistent with maintaining and expanding its network, and increasing its ability to meet demands for wholesale (access and interconnect) services.

3.4. Overseas experience

95. The access and interconnection pricing principles adopted in Australia are largely the same as those used in other countries with substantially deregulated telecommunications markets, although there is a wide variety of methods used to implement them in practice. Despite these practical differences, the principle of promoting efficient investment as part of a LTIE goal is commonly accepted, and it is also generally accepted that an effective access and interconnection regime will induce appropriate levels and distributions of investment in network capacity. It might be expected that the investment response to deregulation and access regimes might therefore be common across countries.

96. Access Economics sought data on telecommunications investment levels and composition for developed countries that have undertaken competition policy and access regime reforms comparable with the Australian experience, but we were unable to obtain any information from most public and official sources in the time available. As noted in the introduction to this Section, it appears only the Federal Communications Commission (FCC) in the United States, one of the best international sources of telecommunications industry data, produces information specifically detailing investment and capacity levels of the major US carriers. Our examination of the descriptions of the data that might be obtained from other overseas organisations suggests that the detailed telecommunications-specific investment information is not generally collected, and therefore would not be available from subscription or other private sources.

97. It is interesting to note that the international investment and price data contained in Appendix 7 to the Final Report of the recent New Zealand *Ministerial Inquiry into Telecommunications*[14] are also very limited. Most of the data are financial ratios, and the information on investment is confined to aggregate capital expenditure across a few OECD countries expressed as a ratio to the number of access lines, and the series all end in 1997.

3.4.1. United States' experience

98. Unlike most developed countries, the telecommunications industry in the United States has always been predominantly privately owned and operated. Although this led to dominance of the industry by AT&T through its long-distance network, the market was substantially opened to additional competition through the forced divestiture by AT&T of its regional operating companies from 1984. The industry was further opened (and to some degree deregulated) at the beginning of 1997 by the *Telecommunications Act 1996* which was intended to introduce competition to local services markets.

99. There are now approximately 1,300 companies that provide local telephone service in the United States. These local exchange carriers (LECs) range in size from small cooperatives to large holding companies with millions of customer lines. Of these, only larger companies (in 1999, those with more than $114 million in annual revenues) are generally required to file information with the FCC and only companies affiliated with the five largest holding companies are required to file the most extensive information. New telephone service providers, referred to as competitive local exchange carriers (CLECs), and providers of wireless telephone service are not required to file detailed statistical data with the

[14] Ministerial Inquiry into Telecommunications, *Final Report*, 27 September 2000, (final.pdf and appendix7.pdf) available from http://www.teleinquiry.govt.nz.

Commission. The information collected by the FCC is summarised in its annual *Statistics of Common Carriers* (SCC) reports, from which the data presented below are drawn[15].

100. There were 52 reporting incumbent LECs included in the SCC reports in 1999, and these companies account for more than 90% of the US local telephone industry. Nevertheless, the FCC warns that, because they do not reflect a complete census of the industry, some caution needs to be exercised when inferring the pattern and levels of industry-wide investment based on their reports. It is, however, perhaps more appropriate to concentrate on the incumbent firms when examining the effects of the opening of the local market.

101. Table 3-5 shows the net changes in reporting LECs' communications plant in each of the years between 1994 and 1999, both in total and for the subset of Regional Bell Operating Companies (RBOCs) (those carriers originally divested by AT&T). These figures give a better indication of the changes in installed capacity than the investment data for Australia as they net out the value of plant retired each year. The value of changes is divided between major network and support categories, including general support, switching, and transmission. The changes in plant for the totals of all reporting LECs are graphed in Figure 3-11 below.

Table 3-5: Changes in Reporting LECs' communications plant, $US million

	Net change over calendar year $USm					
	1994	1995	1996	1997	1998	1999
All Reporting Local Exchange Companies						
General support	1,107.3	1,362.1	601.3	-640.5	599.8	168.5
Central office switching	41.1	1,135.1	2,064.8	2,612.7	3,179.2	1,977.2
Operator systems	-30.2	-60.9	-28.6	-43.9	-23.0	-109.4
Central office transmission	2,902.7	3,227.7	4,275.7	4,814.8	5,541.0	6,262.7
Information origination/termination	-334.2	132.1	131.3	-252.7	408.3	189.5
Cable & wire facilities	4,551.1	4,527.6	5,643.8	5,709.3	5,687.0	5,900.6
Amortizable assets & intangibles	-10.8	67.4	-92.8	40.7	-30.7	1,287.5
Total Telecommunications Plant in Service	8,227.1	10,391.0	12,595.4	12,240.4	15,361.6	15,676.6
Regional Bell Operating Companies						
General support	927.6	1,200.4	444.0	-604.9	355.9	113.4
Central office switching	72.0	710.8	1,786.1	2,246.0	2,642.0	1,721.0
Operator systems	-49.7	-64.7	-3.2	-41.2	-19.1	-101.9
Central office transmission	2,000.7	2,648.6	3,475.5	3,815.4	4,733.7	5,791.4
Information origination/termination	20.5	263.3	119.7	-138.1	305.5	186.4
Cable & wire facilities	3,300.1	3,298.1	4,150.9	4,331.6	4,164.9	5,457.3
Amortizable assets & intangibles	-26.2	62.9	-81.1	-22.7	18.2	1,276.4
Total Telecommunications Plant in Service	6,245.1	8,119.4	9,891.9	9,586.1	12,201.3	14,443.9

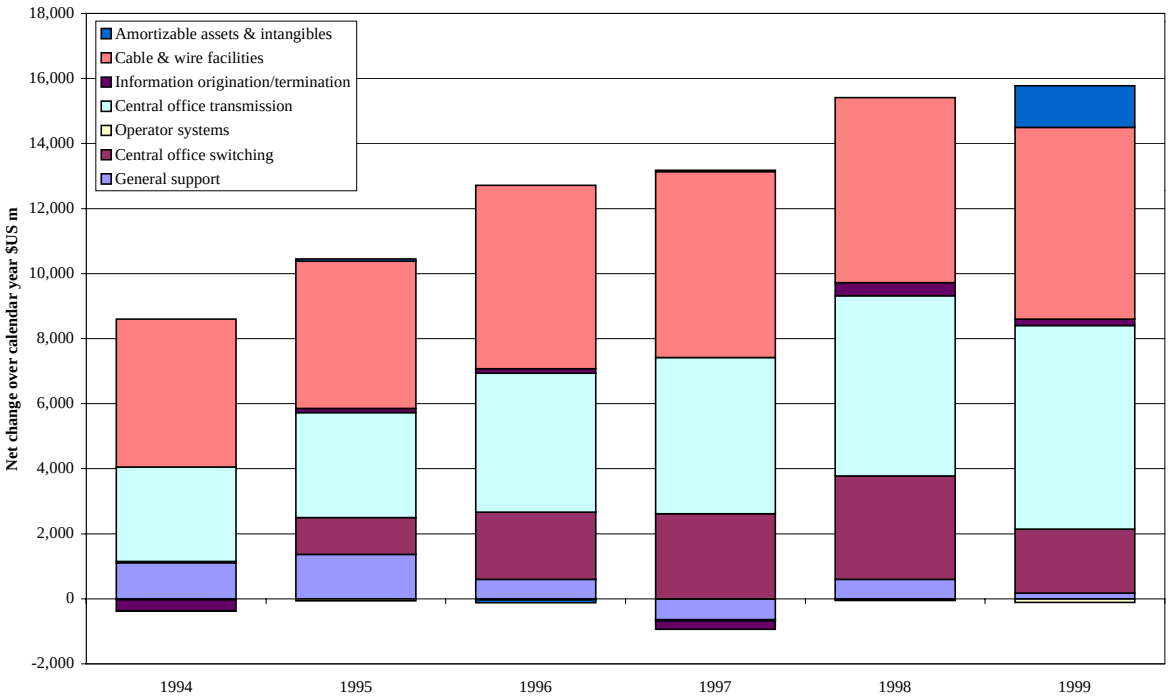
Source: Table 2-7 of the FCC *Statistics of Common Carriers*, various editions.

102. There has been strong growth in the rate of change of US LEC's installed plant over the period shown, with the total annual increase in plant almost doubling from $US8.2 billion

[15] The data are taken from Table 2-7 of the various *Statistics of Common Carriers* reports available from the FCC web site at: http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/socc.html.

in 1994 to $US15.7 billion in 1999. However, the pattern is not repeated across all network categories, and there has been more emphasis on building core network facilities, such as switching, transmission and cable & wire facilities, than general support. This emphasis appears to be common to all LECs. Although the RBOCs dominate investment in the sector, with more than 75 per cent of the changes in installed plant in all years, this distribution of investment across facilities is much the same for the remaining carriers.

Figure 3-11: All Reporting US LECs change in communications plant, $US million



103. There does not appear to be any substantial impact on the level or distribution of the changes in installed plant as a consequence of the change in the regulatory environment at the beginning of 1997. It is clear from Figure 3-11 that the trends in the total and distribution of the changes in installed plant run smoothly across all six years, although there does appear to be a slight fall below trend growth in 1997. The lack of a significant response may be an indication that the local carriage markets have not been successfully opened by the *Telecommunications Act 1996*, or that, for the incumbent carriers, opening their networks to competitors has not led to substantial changes in the level or composition of investment.

104. Note that, although the change over each year shown in Table 3-5 is calculated from consistent beginning- and end-year data, the number and composition of the group of reporting companies varies from year to year. Consequently, rather than comparing the nominal increases in plant in each category, it is more appropriate to examine across years the percentage changes in installed plant within each year (on the assumption that, although changing the number of reporting firms will affect the value of the change in plant, the percentage changes will be similar across all firms, reporting and non-reporting). These percentage changes are presented in Table 3-6.

Table 3-6: Percentage changes in Reporting LECs' communications plant

	Net change over calendar year %					
	1994	1995	1996	1997	1998	1999
All Reporting Local Exchange Companies						
General support	2.8%	3.3%	1.4%	-1.5%	1.4%	0.4%
Central office switching	0.1%	2.1%	3.7%	4.5%	5.3%	3.1%
Operator systems	-2.7%	-5.6%	-2.8%	-4.4%	-2.4%	-11.8%
Central office transmission	6.6%	6.9%	8.5%	8.9%	9.4%	9.6%
Information origination/termination	-6.4%	2.7%	2.6%	-4.9%	8.2%	3.5%
Cable & wire facilities	4.0%	3.8%	4.6%	4.4%	4.2%	4.2%
Amortizable assets & intangibles	-0.5%	3.4%	-4.5%	2.1%	-1.5%	65.4%
Total Telecommunications Plant in Service	3.2%	3.9%	4.5%	4.2%	5.0%	4.9%
Regional Bell Operating Companies						
General support	2.9%	3.6%	1.3%	-1.7%	1.0%	0.3%
Central office switching	0.2%	1.7%	4.3%	5.2%	5.7%	2.9%
Operator systems	-5.4%	-7.4%	-0.4%	-5.1%	-2.5%	-11.4%
Central office transmission	5.5%	6.9%	8.4%	8.5%	9.6%	9.4%
Information origination/termination	0.6%	7.4%	3.1%	-3.5%	7.9%	3.7%
Cable & wire facilities	3.7%	3.6%	4.4%	4.4%	4.0%	4.2%
Amortizable assets & intangibles	-1.5%	3.8%	-4.7%	-1.4%	1.1%	67.6%
Total Telecommunications Plant in Service	3.1%	3.9%	4.5%	4.2%	5.0%	4.8%

Source: Table 2-7 of the FCC *Statistics of Common Carriers*, various editions.

105. Expressed in this way, the increase in installed plant does not appear as substantial as the changes in levels. Part of the growth in investment apparent from the raw changes in plant levels is therefore due to growth in the number of reporting carriers. Nevertheless, the net growth in installed plant is still strong in all years, and the distribution across categories still exhibits the trend towards core network facilities noted earlier. There is a slight decrease in 1997 in the rate of growth of installed plant below the trend, again possibly due to delays induced by the transition to the new regime, but no sign of a sustained impact.

4. The investment impact of the 1997 regime

4.1. In-principle effects

106. The analytical discussion in Section 2 illustrated a number of potential in-principle effects of the introduction of an access regime. While the impact depended on a number of factors, including the relative efficiency of initial pricing and capacity, in most cases there was an incentive for the incumbent to increase installed capacity, suggesting that the regime would lead to an initial burst of investment and higher sustained capital expenditure into the future. The key driver of this was the need to serve greater demand at lower prices as the incumbent's market power was weakened, and came at the cost of monopoly rents (with both the total and the incumbent's share reduced in the process).

107. Although uncertainty about future demands and costs can create impediments to investment compared with levels in a certain environment, delay is an efficient response when new information is expected over time, and introducing an access regime will not reduce observed investment unless it adds to the level of uncertainty. While this may be an inevitable consequence in the transition to any new regulatory regime, it does not constitute a criticism of the regime itself.

108. The efficiency of investment under an access regime was, however, contingent on an appropriate price being charged. This meant a price which reflected the long-run, incremental and forward-looking costs of the relevant telecommunications network capacity. Although it is subject to criticism, the ACCC's implementation of the 1997 regime has been consistent with the LTIE objective and efficient access pricing principles and it has not adopted any positions which, in principle, will have created disincentives to efficient investment. The appropriateness of the ACCC's quantitative assessments and implementation of the new regime can probably only be tested over time.

109. An access regime with efficient prices will, in principle, weaken the market power of an incumbent monopolist, leading to lower retail prices, expanded network capacity and higher on-going investment. While competition is growing, the incumbent will not, however, have incentives to invest efficiently or to allow access to the services of its facilities at efficient prices. It is likely that Telstra's adverse assessments of the appropriateness of access pricing declarations and the pattern of entrants' network investments are strongly influenced by its continued position as the dominant incumbent.

110. The discussion in Section 2 also argued that monopoly rents in a capital intensive industry tend to be generated through combinations of excessive retail rental and use charges and restricted network capacity. Just as opening a market to competition through an access regime will tend to curtail monopoly power and encourage efficient investment in expansion of the incumbent's network, similar consequences might be expected from efficient industry-specific anti-competitive regulation. That is, regulation which prevents actions to limit competitors' entry into the incumbent's markets, or which ensures the operation of the access regime is not thwarted by anti-competitive actions to delay or inhibit use of services provided by the incumbent's facilities, will improve market efficiency and serve LTIE. To the extent that it supports entry by efficient competitors and the operation of an access regime, regulation to control anti-competitive conduct will therefore, in principle, also encourage the efficient use of, and investment in, telecommunications infrastructure.

111. An access and anti-competitive regulatory regime is an important part of the creation of a competitive market in a network industry such as telecommunications, so there is no *in-*

principle inconsistency between establishing such a regime and the long-term interest of end-users (LTIE) test or its component criteria, as spelled out by Part XIC. Similarly, there is nothing in the *design* of the present regulatory regime that is likely to cause inefficient investment. There is a possibility that the *transition* to a new regime and the access prices introduced in the process could cause problems, particularly by delaying needed investment and capacity expansion. If they occur, these costs will, nevertheless, be offset by the ongoing benefits of more open markets.

4.2. Impact of the regime as implemented

112. It is almost impossible to say what the efficient level or distribution of telecommunications investment should be, since this is in part dependent on the structure of the market being serviced (including the creation of the wholesale market through the enforcement of the access regime). It is also difficult to assess whether the observed levels and placement new telecommunications capacity is efficient, since it is likely that some of what was *ex ante* efficient and profitable investment will prove to be wasteful and unprofitable.

113. It might be argued that 1997 access regime has still to be tested, since the provision of access and interconnection has not only recently given entrants some certainty about the cost and terms of local origination and termination, and the associated ability to offer full-service accounts to their customers. Any problems with the level or distribution of telecommunications investment may therefore only be transitory, rather than symptomatic of problems with the design or implementation of the regime.

114. Based on the available data, there is no strong evidence that investment levels have fallen as a consequence of the new regime, or that the level or pattern of investment have been *ex ante* inefficient. On balance, the data suggest that, while the uncertainty associated with the transition to the new regime may have delayed some investment decisions, the operation of the regime itself has spurred higher and potentially more innovative levels of investment than might have emerged from a deregulated market without the access regime established by Part XIC. There is also evidence that the regime has induced investment in telecommunications facilities by private users.

115. One theme running through the Telstra submissions to this Inquiry is that the access and competition regimes have failed because they have created disincentives to invest that mean entrants' investment is "desperately lacking"[16] in certain areas, particularly in the local loop, and they have not built facilities outside the "most densely populated, high revenue areas"[17]. Although Telstra associates some of this with retail price controls, the pattern of investment is "exacerbated by the ACCC's systematic tendency to set access charges at levels that are very low by any reasonable standard."[18].

116. If Telstra's claims are correct, and there is no evidence to support this, it may be due to implementation problems and the delays to decisions to build created by the uncertainty of the new regime. That is, the problems are transitional, not structural. Alternatively, even if entrants are willing to invest in particular areas, it may not be efficient for them to do so. That is, there is no new investment because none is needed as long as they gain access to Telstra's networks at efficient prices. Indeed, efficient use of the Telstra local loop in most

[16] Telstra Submission 24 to the Inquiry, page 2.

[17] *Op cit*, Section 1.5, page 18.

[18] *Op cit*, Section 1.5, page 21.

circumstances is the best outcome, since for most residential customers the current Customer Access Network (CAN) is more than sufficient. However, for high value customers this is not the case. Where such customers are businesses they are usually geographically aggregated (in the various CBDs) and therefore alternative CAN is viable and has, to a degree, been constructed by entrants. The problem with high value *residential* customers is that they are usually geographically dispersed, thus making CAN investment (under current technologies) to attract these customers marginal at best.

117. Note that, as detailed in the Section 3.3, Telstra's own capital expenditure does not appear to have been hampered by the new access regime, and increased again in 1999-00. Moreover, as noted in the Press Release (30 August 2000) accompanying Telstra's 1999-00 results:

> *Capital expenditure increased by 10.6 percent to $4.8 billion. This reflected increased expenditure for a major upgrade of the Customer Access Network (CAN) of $1.3 billion to improve the quality of service and reduce faults, further investment in the CDMA network, meeting the demand for surging wideband capacity and significant expenditure on new systems software.*

118. This does not appear consistent with Telstra's arguments that its incentives to invest have been severely hamstrung by the new access regime. While it could still be argued that the level or pattern of investment would have been different if the access regime had not been in place, or if the access prices declared by the ACCC had been higher, there is no mention of impediments of this sort in the papers accompanying the details of Telstra's actual and proposed capital works in its latest financial reports.

119. The Australian data discussed in the previous Section suggest that investment plans may have been delayed by regulatory uncertainty. Nevertheless, it is not obvious that investment has been inefficient or that the new regime has held back the installation of capacity that is "desperately" needed. As might be expected, the investment undertaken by Telstra's competitors has been in area of expected high returns (long-distance carriage) and new markets where entry opportunities exist (mobiles).

120. The absence of entrant investment in particular regions or types of service is not evidence of the inefficiency of the level of the access prices that have applied to date (or of those expected to result from ACCC processes). While the access regime does create some incentive for entrants to factor the option to use Telstra's network into their build or buy decision, this can be allowed for in the negotiated or arbitrated price with a factor related to the riskiness of capital expansion. That there has been significant network building by entrants at all suggests that access to (at least parts) of Telstra's network are still, and are expected to remain, priced too high (or that the terms and conditions attached to "reasonable" prices are too restrictive – by preventing access to facilities at points that allow the provision of advanced retail services, for example). Moreover, the absence of entrant investment in local capacity is possibly a sign that the access regime is working. Given that Telstra has already upgraded large parts of its CAN, it would be productively inefficient if others reproduced these facilities when their services should be available from Telstra.

121. Telstra's claim that entrants should have been building their own local loops as an alternative to paying access charges that were "excessively high" is also possibly partly explained by the discussion in Section 2.3.2. That is, even allowing for the likelihood that entrants' demands could (and therefore generally should) be accommodated on Telstra's networks, the option value of waiting creates a good commercial reason for entrants not to invest in their own last-mile networks until the regulatory processes have been exhausted.

122. To the extent that there is a problem, it may lie with strict reliance on the prices determined by the ACCC, rather than the use of these as the basis for commercial negotiation. That is, the ACCC's interim determinations and assessments should provide a focal point for negotiations, around which variations can be built to account for regional cost disparities and other factors that would otherwise have influenced build or buy decisions. This suggests that a more proactive stance by the ACCC may have been desirable, with it making an assessment of "reasonable" access charges for a range of interconnection services well ahead of its having to arbitrate failed commercial negotiations. Although the ACCC has made very few binding assessments there is little point in changing the processes built in to the access regime. The experience is, however, instructive for the design of other processes in other industries, and should be considered if the generic and telecommunications-specific access regimes in the *Trade Practices Act* were to be harmonised.