REPORT

CENTRE FOR
INTERNATIONAL
ECONOMICS

Broadband, Competition and Growth

Widening the gains from technology

Prepared for

Competitive Carriers Coalition (CCC) Inc.

Centre for International Economics
Canberra & Sydney

December 2004

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1 Introduction

WHILE THE 'DOT COM' BUBBLE OR THE 'TECH WRECK' spoilt the chances of many speculators to make a quick fortune, the underlying structural changes that excited financial markets at that time have actually delivered the goods in the real economy. Increased investment in ICT with greater competition has driven a surge in productivity. This in turn has supported Australia's record of sustained strong growth since the late 1980s. The evidence pointing to this outcome is compelling and unambiguous.

Recent studies suggest that there is an opportunity to maintain high growth rates with widespread access to and use of the next generation of high broadband or 'true' broadband technologies. Research also points to an additional growth premium if that investment is supported by a policy approach that encourages increased competition. Others argue that the next stage of investment in true broadband will only be made within the next several years if there is a shift in policy supporting genuine competition in the broadband market and the abuse of market power is curtailed.

The CIE is pleased to have been commissioned by the Competitive Carriers Coalition (CCC) to prepare this paper.

Chapter 2 reviews the underlying story about the nature and impact of competition policy changes.

Chapter 3 looks at the opportunities opened from the next logical step in the use of technology.

Chapter 4 points to a pathway for future progress that is the logical extension of progress made to date, yet which addresses the underlying impediments to the full realisation of the emerging potential of broadband technology.

2 *Competition and growth*

REFORM OF AUSTRALIA'S INFRASTRUCTURE, especially the services provided by large utilities, was identified as a key need in the Hilmer review. It was subsequently adopted as a core aim of the National Competition Policy agreed by Australian governments at the National and state levels. It is important to review what has been done before looking at what has been left undone and the potential for future gains.

Utility restructuring

Governments in Australia once provided services such as water, electricity and communications through the ownership and operation of large integrated utilities. A vertically integrated operation combines different levels of the supply chain. In electricity supply, for example, it was not unusual for a single entity to produce the electricity, operate the transmission and distribution facilities and undertake the retailing function services to households (ie, process the bills and collect payment) within a jurisdiction. Generally these services were provided by a single provider. That is, they were a monopoly.

The thrust of structural reform of utilities pursued since the 1980's has taken five broad directions.

- *Commercialisation* — utilities were reestablished as businesses with a focus upon obtaining an appropriate rate of return. This raised transparency in prices so that they were more likely to reflect underlying costs and reduced the scope for hidden cross subsidies to favoured groups that raised the cost to everyone else.
- *Vertical disaggregation* — many once monolithic utilities have been separated into their component parts. This has introduced greater transparency in cost formulation and price setting and has often led to the establishment of markets at the earlier links in the supply chain (eg, a wholesale market for electricity).

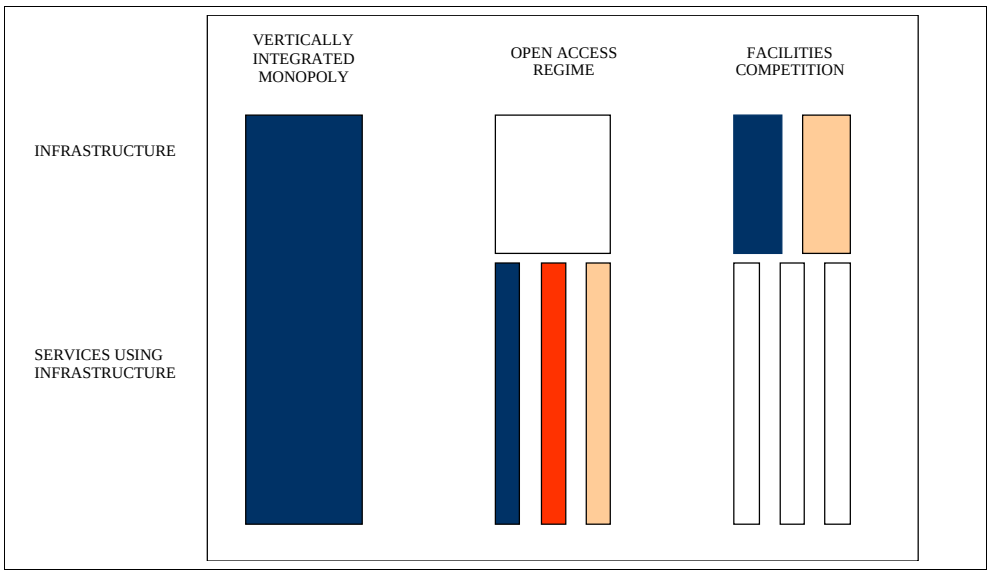
- *Regulation of natural monopolies* — the prices set by the parts of utilities where underlying factors led to the acquisition of market power by a single provider (eg, increasing returns to scale) have been subject to the supervision of independent regulators. The focus is generally upon providing incentives to ensure an efficient level of service at cost reflective prices. It has been the physical network components of many utilities that have been viewed as being natural monopolies requiring such regulation.
- *Facilities based competition* — permitting new entrants to operate infrastructure services in competition with the incumbent provider. This often results in increased competition in upstream markets selling into a wholesale market.
- *Open access competition* — this approach requires the owners of specific facilities to make them available to other parties, avoiding wasteful duplication of infrastructure facilities. This generally results in a range of businesses competing to add value in downstream elements of a supply chain, typically in retail elements close to the final customer.

Privatisation is not included in the list of broad directions. Changing the ownership of utilities does not in itself alter the competitiveness of an industry. Privately owned monopolies are likely to produce deleterious results in much the same way that public monopolies have.

Chart 2.1 outlines these competition ideas diagrammatically.

Many of the major reform thrusts can be discerned in the Australian telecommunications market. The entry of Optus into the Australian telecommunications industry in 1991, when it began to roll out a rival network to Telecom's (now Telstra) is an example of facilities based competition. Many telecommunications carriers now operate in the market reliant upon their ability to work through other companies' infrastructure. Today's particularly intense market for mobile phone telephony services in Australia is an example of open access competition at work.

2.1 **Key Elements of Structural Reform**



Constraining horizontal market power

A further broad thrust of competition policy has been upon preventing the acquisition and abuse of market power and other anti-competitive arrangements. This is implemented mainly through the competition provisions of the Trade Practices Act. The applications of the government's four pillars policy in banking, essentially prohibiting any of the major commercial banks from obtaining a position of dominance through the acquisition of one of the other major banks, is an example of this type of market intervention.

There have been mixed impacts from reforms in this area. While merging of businesses in the same industry (horizontal integration) has been averted to some extent, businesses have instead pushed into indirectly related industries (out of market mergers). In the telecommunications industry for example, there are concerns that Telstra is gradually acquiring a stake across a wide range of industries, especially those in converging areas of content production and distribution, that would give it strategic influence that may be used to the disadvantage of its competitors.

The impact of increased competition

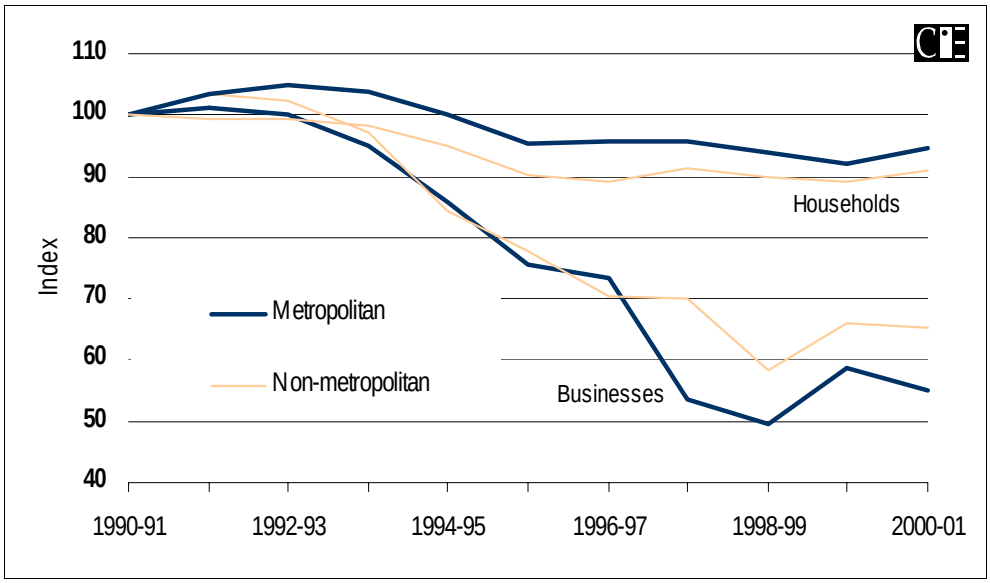
Competition policy reform can be a messy business. The pain of reform is usually felt by those most directly involved. This includes the industries being reformed, the owners (ie, shareholders), the employees concerned and the formerly privileged customer groups. All of these groups have a

strong incentive to complain and resist change and they do, often with great volume. Meanwhile the benefits of reform are spread widely and take time to become apparent.

The most pertinent indicator of tangible benefits from reform is a reduction in prices, especially a sustained decrease in prices. It is now a matter of fact that prices for electricity, water and telecommunications services dropped markedly following reforms, particularly for businesses.

Chart 2.2 illustrates the sustained and deep price reductions observed in electricity supply.

2.2 **Real electricity prices following deregulation[a]**



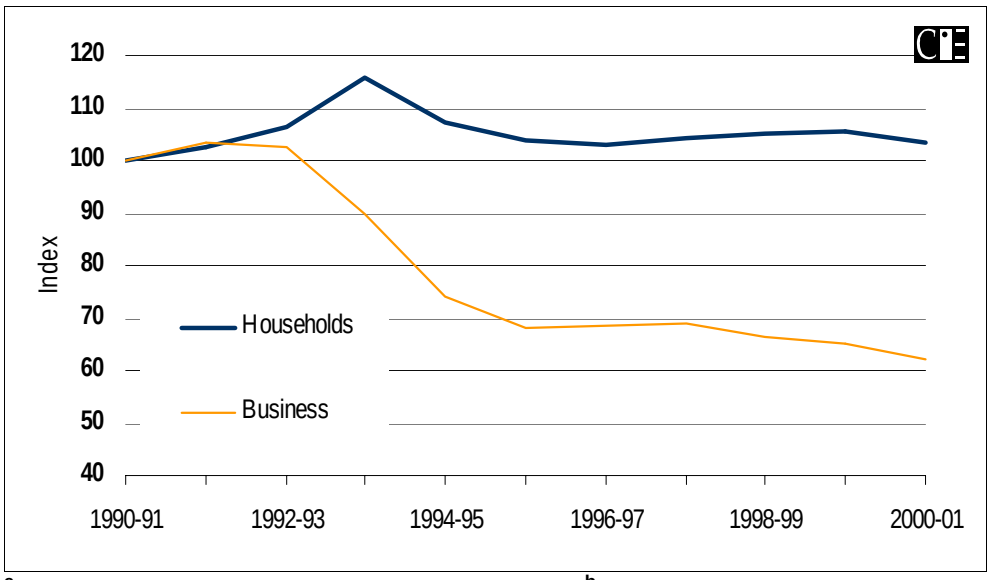
[a] Business estimates are a simple average of prices for each business type. Prices are retail.

Data source: Productivity Commission and CIE calculations

The 40 per cent reduction in prices faced by business for their electricity reflected in chart 2.2 suggests a significant boost in the competitiveness of Australian business. Lower costs to business flows through to lower prices for consumers across a range of other products and services.

While not as deep the general reduction in prices faced by businesses for electricity, price reductions in water and telecommunications are nevertheless substantial. It is notable that there was a mild increase in water prices for households reflecting the introduction of two part tariff structures that were more cost reflective.

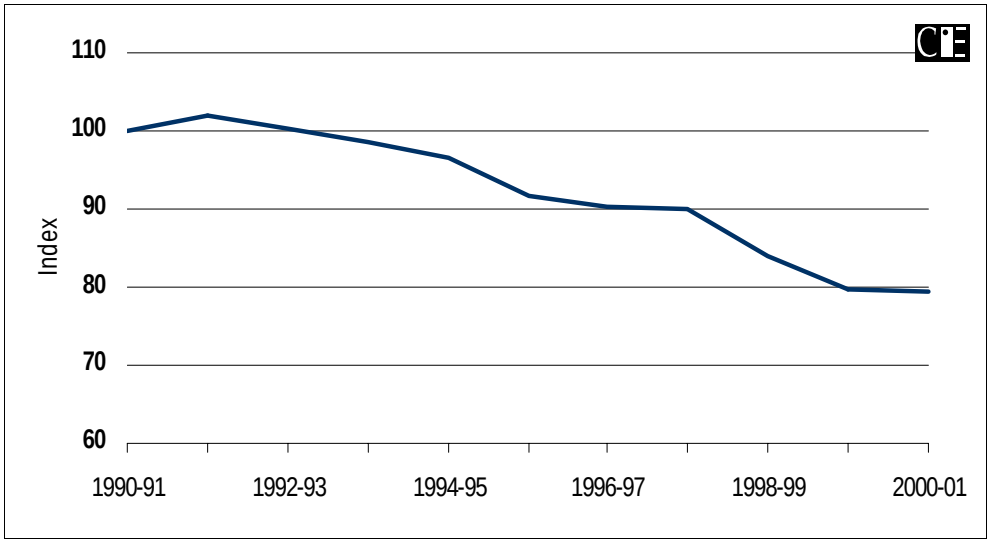
2.3 **Real water prices[a, b]**



[a] Households is for metropolitan households weighted by population. [b] Business is an average of different user types from Sydney Water Corporation. Prcies are retail.

Data source: Productivity Commission and CIE calculations

2.4 **Real telecommunications prices**



Data source: Productivity Commission

These price reductions have reflected better use of resources. Employment in the electricity supply industry, for example, more than halved between 1985 and 1997, while electricity production and use increased. Structural adjustment has not been easy for some, but it is notable that the period of reform and change has been accompanied by strong underlying growth in the economy and the labour market largely as predicted.

While the evidence of the gains from reform is substantial, there are concerns about hidden costs and implications. Some suggest that the

quality of service is falling. The evidence about measurable aspects of service quality suggests that the opposite is the case. The amount of lost network time for Telstra's local and STD calls, for example, has been reduced to one-tenth of the 1992 level by 2000. Similarly, measures of quality for electricity distribution improved markedly in the early 1990s and have maintained these levels (Productivity Commission 2002).

Overall, the evidence provides strong support for the view that increased competition results in increased efficiency and lower prices.

3 The true broadband dividend

THERE IS EMERGING EVIDENCE that true broadband use opens an opportunity for economic gains.

ICT investments and growth

A key point is that ICT investments have been a driver of growth.

Despite the volatility in the financial markets regarding high technology ventures, Australian businesses have been rapid adopters of ICT technologies. Already more than 70 per cent of Australian businesses have access to the Internet (ABS 2003). Businesses use ICT to generate cost savings, to raise productivity, to access additional markets and generate revenue growth and to raise their capacity. In some cases they have no choice but to adopt new approaches enabled by ICT because their customers, suppliers or competitive necessity demanded it (NOIE 2003).

If the changes brought about by ICT mattered this would show up in the economic statistics. That is precisely where they are to be found. The Reserve Bank has found in its understated style that 'the numbers do suggest that investment in information technology has contributed quite a lot to Australian labour productivity growth' (Gruen 2001). In a series of exacting studies the Productivity Commission has confirmed that Australia generated a productivity acceleration of 1.1 per cent since the mid 1990s from the use of ICTs (Parham 2002a, Parham 2002b, Parham 2002c, Productivity Commission 2004, Connolly and Fox 2004, Simon and Wardrop 2001, Parham, Roberts and Sun 2001, Gretton, Gali and Parham 2002, Bean 2000). If 1.1 per cent does not sound like much of an acceleration it is notable that this equates to additional growth of over $7 billion per annum.

The ICT experience has not been limited to Australia. Evidence from other countries confirms the substantial gains to ICT uptake (OECD 2003, Parham, Roberts and Sun 2001).

But have the gains from ICT been fully realised, or is there reason to expect further gains from the uptake of the next wave of ICT investment, particularly through the use of broadband? Detailed studies about this issue suggest that the gains from investment in broadband have the potential to be at least as great as the gains from ICT (Cisco 2002, Broadband Advisory Group 2003, KPMG 2004). The Broadband Advisory Group, for example forecast that broadband will generate additional gains of $12 to $30 billion for Australia per year. A US study estimated that widespread broadband use could boost income in that economy by around US$500 billion per year (Crandall and Jackson 2001). Studies from the United Kingdom , Korea, New Zealand and Ireland report expected gains of between 0.5 to 2.5 per cent of GDP to be achieved over the longer term.

The Ericsson contribution

A recent study conducted for Ericsson indicates that adoption of a true broadband network would stimulate significant net economic gains in the economy at large. More importantly, the study found that the gains were a mixture of technology impacts as well as the impact of competition.

True Broadband

True broadband is defined by Ericsson as a network that provides multiple service capability through speeds greater than 10Mbps (rather than 2nd generation *Internet* access primarily delivered through ADSL 'broadband' which is much slower). Table 3.2 outlines the differences in communication technologies and their implications for capabilities.

The network that was analysed in the Ericsson study was a fibre-to-the-home network capable of network speeds of 100 Mbps. This provides the capacity to support a bundled product offering including voice telephony, high speed Internet services and video / television services such as pay TV. The network rollout was portrayed as covering 50 per cent of businesses and households in the region over a 4 year timeframe. The study also assumed conservatively that 20 per cent of homes and businesses that were passed by the network would subscribe to its services.

3.1 How is true broadband different?

Technology	*Speed*	*Characteristics*	*Capabilities*
Dial-up (1st generation technology)	Less than 56 Kbps	Not always on	Email
		Single user	(slow) *Internet*
		Single use	
Early broadband (2nd generation)	56 Kbps to 10 Mbps	Always on	1st generation plus:
Examples: ADSL and Satellite		Dual use	Graphics
		Multi-user	Rich information exchange
		Typically asymmetric (faster on download)	
True broadband (3rd generation)	10 Mbps +	Always on	2nd generation plus:
		Multi-user	Interactive services
		Two way functionality	VoIP
		Multiple content	Video
			Video on demand

Source: TIAC 2003 and Ericsson 2003

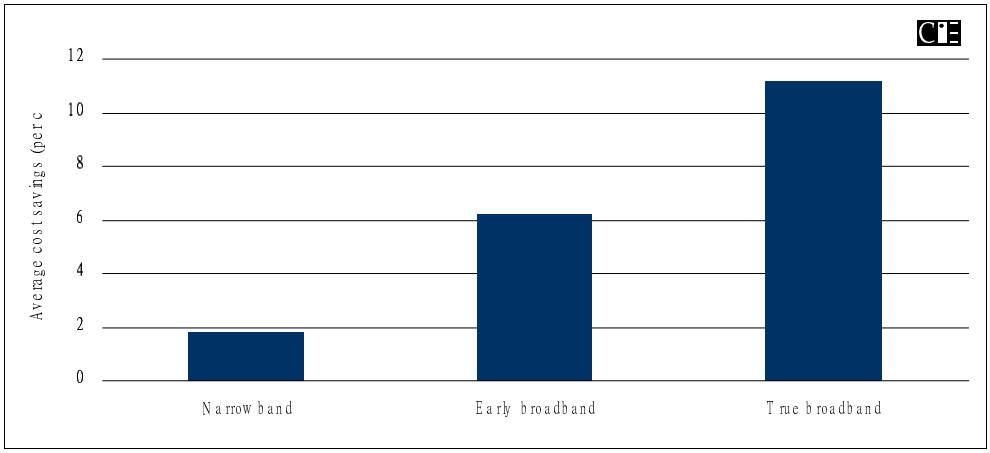
Expectations of additional economic growth from broadband are supported by studies published by Cisco Systems and Ericsson. Both of these studies were founded upon data obtained from a large national survey of businesses from across Australia. The studies found that businesses using narrowband internet access enjoyed a cost saving over firms that had no internet access of nearly 2 per cent. Businesses that incorporated early broadband technologies were found to have an additional cost saving of around 4 per cent. This and other indicators presented in those studies suggest that progressive advances in the use of the internet has changed businesses. Narrowband internet users were largely restricted to simple communications — essentially internet access supplemented the telephone. Early broadband users appear to have applied the technology to a greater range of businesses processes, including routine communications, purchasing inputs, providing information about businesses and products. Some businesses made progress towards enhanced interaction with customers and the enablement of more efficient sales and delivery arrangements.

The Ericsson study extrapolates the future productivity gains from the use of true broadband based on the previous trend. It finds that the gain from true broadband could be equal to the gain observed when firms moved from narrowband to early broadband. As with most forecasts, there is a margin of error. The risks to the forecasts, however, seem balanced. Diminishing returns may set in. On the other hand, true broadband offers many additional services and scope for even more significant change in the

way that things are done when it involves unifying telephony, internet access and content capability.

The progression in productivity gains over the long run from narrowband to early broadband to a forecast for true broadband is illustrated in the figure below.

3.2 **The productivity benefits for business from improved bandwidth[a]**



a Incremental long run cost savings

Data source: Ericsson 2003

True broadband and competition

Competition also makes a difference to the outcome in the Ericsson study. Two categories of competitive pressures were examined.

- *Facilities competition*. The introduction of an additional true broadband network introduces a new competitor. It could compete in many of the network services that are currently dominated by incumbent providers, such as telephony and ISP. But the broadband network will only provide a competitive impetus to the incumbent if it is not controlled by them. The evidence from the entrance of Optus into the telephony network in 1991 showed that facilities competition can promote a competitive dynamic, raising efficiency and reducing prices. Such competitive momentum can fade over time, however, once the new entrant is entrenched and the market adjusts to an oligopolistic structure.
- *Open access competition*. Making the additional network an open access network would introduce vigorous competition by service retailers and content providers. Two regulatory steps are necessary. The first is to ensure access to the network by competitive retailers at an efficient price. The second is to ensure that the network owner cannot abuse its

market power. This is in contrast to prevailing models where services are often provided by an integrated provider operating network and retail functions.

Key impacts from the Ericsson study are reported in the table below. The study found that, after accounting for the costs of deploying and operating the network, gross regional product in the Brisbane and surrounding area would rise by over $2.5 billion from rolling out and using a broadband network. This gain is underpinned by improvements in productivity through the use of broadband as well as gains through competition with Telstra's network. If the broadband network was regulated through an open access framework then the gains would be more than $3 billion, as better services and lower prices encouraged faster take up of broadband.

The establishment of a broadband network would boost the region's employment. Under an open access regime, employment would not rise as much as if the network was part of a vertically integrated business, reflecting the greater efficiency in service provision that occurs with more competition.

3.3 **Regional economic impacts from a true broadband network**

Indicator	*New facility competition*	*Open access network*
Change in Gross Regional Product (Net Present Value over 15 years)	2,640	3,160
Change in regional employment Average job numbers over 15 years	1,030	1,005

Source: Ericsson 2003

The Ericsson figures were produced using the MMRF model of the Australian economy. This is broadly the same model used recently by the Productivity Commission to assess the impacts of infrastructure industry change (Productivity Commission 2004b) and is used by many other economic policy agencies and state Treasuries.

While the Ericsson study applied the network to Brisbane and its surrounding urban areas, it reported that similar figures would have been found for any major capital city in Australia.

These findings show what is becoming increasingly apparent. While there are gains from the use of emerging ICT technologies and gains from increased competition, it is likely that the gains are magnified when they are applied together.

4 Pathway for progress

WHAT ARE THE NEXT STEPS? The earlier chapters have shown that there is an opportunity to obtain significant economic gains. What is stopping this? What needs to be done to overcome barriers to broadband uptake?

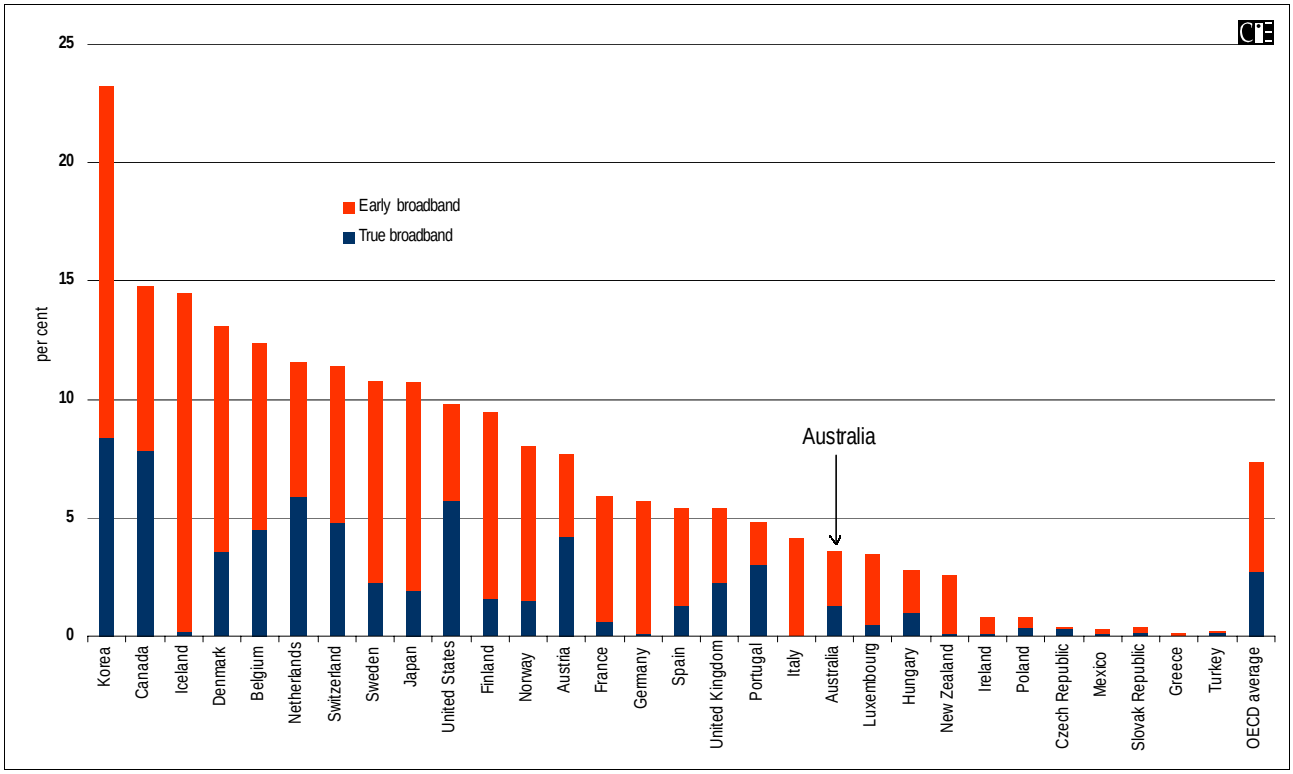
Australia is lagging

While Australians have been quick to adopt ICT technologies in general, the evidence indicates that Australia is lagging in the adoption of broadband and true broadband capabilities. Independent analysts regularly provide evidence of Australia's relatively poor performance in this area. The OECD, for example, reveals that Australia is well below the average of comparable countries in the uptake of total broadband and true broadband (See Chart 4.1). There is a danger that Australia may be late in accessing the potential of broadband.

Most of the impediments that are routinely discussed to explain away Australia's relatively poor adoption rate of broadband capability do not appear to be substantive. These are reviewed briefly below.

- *Lack of awareness of the potential of broadband.* In a truly competitive market, infrastructure and service providers would have undertaken an aggressive marketing campaign to show the benefits that broadband can deliver. Even within current market constraints consumers and business have been bombarded in media for some years about broadband.
- *Lack of services and content*. It is not clear why the content being used in other countries is attractive there, but is not compelling in Australia.
- *Lack of demand aggregation*. Demand aggregation is only seen as an issue in areas where the commercial benefits of broadband are marginal, such as rural and remote areas.

4.1 **Broadband access in OECD countries, December 2003**



Data source: OECD

Addressing the unfinished business

The main factors that have contributed to Australia's relatively poor broadband adoption have been identified by those that have looked closely. KPMG recently wrote that there were three key factors:

- a lack of competitive access to infrastructure and the dominance of one carrier in multiple telecommunications segments;
- relatively slow initial rollout of retail services; and
- initially high prices.

If fact, all of these factors are linked to the lack of competition, or more correctly, deficiencies in the regulatory structure to prevent the abuse of monopoly power. Competition policy is the key. In its review of the development of broadband access in OECD countries the OECD noted that 'the roll out of broadband services has kept lockstep with the roll out of competition'. The OECD's analysis of Australia shows that Telstra and the market at large has delivered very little progress in broadband deployment until regulatory intervention has forced each incremental step (2001).

There is ample evidence that reform of the telecommunications sector in Australia is unfinished business. It is increasingly apparent that the current approach permits Telstra to operate as one of the most integrated telecommunications companies in the world, operating as the major wholesale and retail supplier of services including:

- local, national, international and mobile telephony;
- dial and broadband internet; and
- pay TV

Most importantly Telstra has a controlling stake in the major access networks that connect nearly every household and business in Australia.

The current structural situation in the telecommunications market has tangible dimensions. Ed Willet, a Commissioner in the ACCC recently observed that

> The existence of such extensive market power provides Telstra with both the ability — and importantly, the incentive — to try and thwart entry into complementary goods by other companies. (Willett 2004)

Telstra can undercut new entrants seeking to provide regional broadband networks in basic services such as telephony by cross-subsidisation from other regions and business segments. Furthermore, if Telstra can dominate other markets such as content, it can undermine the ability of competitor networks to provide the products that people want. Even the threat of these types of behaviour from Telstra can be enough to deter the rollout of broadband by other businesses.

This situation is very similar to that of the United Kingdom. OFCOM, the telecommunications regulator in the UK, notes that while it is acknowledged that the shift to broadband internet protocol networks requires new investment, there is little appetite for such new investment to compete with the incumbent telecommunications service provider, British Telecom (BT). In OFCOM's terms

> Enduring economic bottlenecks in fixed telecoms networks remain. By this we mean not just parts of the network where BT has significant market power (SMP), but those areas where effective, infrastructure-based competition is unlikely to emerge in the medium term. (Ofcom 2004)

As a result, Ofcom states that it views the current market and regulatory structure to be 'unsustainable' in its recent discussion paper about proposals for regulatory change.

A major step necessary to make progress in the delivery of True Broadband capacity in Australia is for government, industry and other key stakeholders to come to the realisation that:

- The current market power of Telstra is a problem. It thwarts new entrants and delays new technology adoption.
- The development of new technologies has not led to new competitive networks or enabled a reduction in the scope of regulation. Waiting for a technological solution to market power will delay opportunities at significant cost.
- Emerging markets and services such as true broadband provision will only survive if they are supported by a more appropriate regulatory framework. Regulation needs to ensure that new entrants are not prevented from developing a viable customer base, but should not restrict competition in the longer term.

There also needs to be a pathway for tangible change. Drawing on what has been learnt about reform in other utilities, especially in electricity and gas networks, it is feasible to open an avenue to convert industry interest and willingness to deliver true broadband capability into tangible investment. Key elements would be to:

- Permit new entrants to construct and operate true broadband networks in selected key regions in Australia, this could be achieved by placing a moratorium upon Telstra investment in such networks for a set period of time, say 10 years.
- Separate the natural monopoly part of the broadband and other telecommunications markets (the network) from retail and content provision. Regional network monopolies would be easier to monitor than a national monopoly, because comparisons could be made between different regional operators.
- Prohibit vertical integration of providers or require disciplined ring fencing arrangements to obtain competitive neutrality between retailers and maintain a functioning, undistorted wholesale market for access to regional true broadband networks.
- Further to the separation of natural monopoly elements, set up a specific regulatory process to supervise the development of new infrastructure. The process would involve an independent decisonmaker making determinations about: the efficient level of investment required to deliver that service; and a pricing framework that provided the operator of that infrastructure with an efficient return. There would also need to be a process to decide which operator would operate the regulated infrastructure.

This approach would encourage incremental steps towards competition through new investment. The decision to invest in true broadband infrastructure would be a decision made by businesses. The experience in utilities that are regulated this way is that there is a willingness to invest by business within the framework. Even though the regulated returns are low, they are obtained with commensurately low risk. The proposed arrangements would not impose major costs on government, business or consumers and should in fact keep costs down.

Over time the regulatory frameworks could be relaxed - when market forces could be relied upon to produce efficient outcomes with minimal scope for the abuse of market power by any player.

The proposed arrangements would only impact on Telstra to the extent that they prevent it from abusing market power. Telstra has consistently indicated that it does not intend to invest in major true broadband facilities in the next several years. Telstra could operate as a retailer relying on the new networks if it wished.

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