

MARKET POWER IN BROADBAND

Rod Shogren*

Paper prepared for the
ACCC Regulation Conference
Surfers Paradise Marriott Resort
24-25 July 2008

Introduction

This paper has been prepared as one of three for a conference session about market power in broadband telecommunications. The participants were asked to address the following questions:

- What, if any, are the sources of market power in broadband as new platforms are becoming available for broadband provision?
- How important is speed as an issue, especially in view of the comparison of wireless and wireline alternatives?
- Is the current legislation establishing the telecommunications access regime the right tool for dealing with market power in broadband?

The paper begins with some observations about the extreme focus on the speed of broadband services at the expense of a broader discussion of the nature of the services.

Some suggestions are made about why speed is of the essence, but the focus is shifted away from a supply-side, technological perspective towards a consideration of what it is that users of broadband services actually purchase and the circumstances in which transactions take place.

The focus is further shifted to a very informal discussion of the markets involved from the user's perspective.

This discussion leads to the conclusion that a key characteristic of broadband provision – indeed, the single main factor all forms of broadband service have in common – is a carriage service providing access to customers. This sets the scene for the discussion of market power, where alternative access technologies are considered. Thus the paper returns to supply-side considerations.

Temporarily setting aside major changes to the policy and regulatory environment that are mooted or under way, the current dominance of one wireline operator is examined. The question is whether that dominance would be likely to be sustained under the regulatory framework as it currently stands.

The paper then acknowledges that a major new government intervention in telecommunications is on foot, intended to bring about near universal high-speed

* The views expressed in this paper are those of the author and should not be ascribed to any organisation with which he is associated.

broadband provided by fibre to the node (FTTN) or further, to the customer premises. In a necessarily somewhat speculative way, the policy motivation for this intervention is discussed. The focus is on objectives that could not be dealt with by access regulation of the current form, or at least not within the short timeframes desired by policy-makers.

It turns out that a range of regulatory tools will come into play.

What is broadband?

In any investigation of market power in the provision of a service, some understanding must be gained of the markets in which the service is supplied and purchased, and most likely of related markets as well. The first requisite is clarity about the service in question.

There is some considerable vagueness, if not confusion, about the definition of broadband. One definition I have seen in a dictionary of telecoms terms is “any circuit faster than dial-up”¹. While use of the word “circuit” seems old-fashioned and unnecessarily restrictive, the idea is that broadband is something that is fast in some comparative sense, although the dictionary comments that broadband is more a marketing than a technical term.

Since the term “dial-up” is generally used about Internet access, the implication is that broadband is about fast Internet access. However, as discussed below, broadband can refer to services beyond fast Internet access.

Wikipedia, more broadly, calls broadband a signalling method that uses a relatively wide range of frequencies which may be divided into channels². The implication is that broadband refers to a greater information-carrying capacity than – than what? Well, than narrowband, or dial-up.

Presumably broadband Internet access is a subset, or one use, of broadband signalling, not necessarily using more than one channel but at least using a channel with a (relatively) wide bandwidth.

For the purpose of collecting statistics about broadband usage, a more precise definition is required. The OECD defines broadband as a capability to download at 256 Kbps³ and the ABS definition is an 'always on' Internet connection with an access speed equal to or greater than 256 kbps⁴.

The reason I am labouring this question of definition is to make two points – or perhaps one point twice:

- First, that it is all rather abstract. There is little sense of exactly what it is that a customer would want to purchase or use.
- Secondly, that discussion of broadband tends to be couched in terms of information-carrying capacity and/or speed – essentially the same thing – without regard to what information is being carried, presumably from someone or somewhere to someone or somewhere else, and without regard to why speed is

¹ Harry Newton, *Newton's Telecom Dictionary*, CMP Books, March 2005.

² See <http://en.wikipedia.org/wiki/Broadband>, accessed on 15 July 2008.

³ The term used is OECD Broadband Subscriber Criteria – see the Broadband Portal at <http://www.oecd.org/sti/ict/broadband>.

⁴ ABS, *Internet Activity, Australia*, Dec 2007, Catalogue number 8153.0

so important. This is often spoken of using the analogy of pipes. Broadband means bigger pipes for carrying more information more quickly.

Speed – What do users purchase?

How important is speed as an issue? It appears that speed – or, equivalently, carrying capacity – is the absolute essence of broadband. It is all about bigger pipes.

But on the face of it there is something rather strange in talking about the size of pipes. Users of services supplied by pipes do not normally think in terms of the size of the pipes. Instead they talk about getting enough petrol or gas or water or electricity efficiently – as much as they want, when and where they want it.

Much public discourse about broadband is of pipes as if they are an end in themselves, whereas customers are interested in what comes through the pipes⁵.

Admittedly, if your water only arrived in a trickle, you would develop an intense interest in the means of reticulation. Similarly, with the stuff that is delivered by broadband, the speed of delivery – and hence the capacity of the pipes – is often, but not always, important. Indeed, you could almost say that there are some things that cannot be delivered at all except through sufficiently large pipes. No-one would be happy taking an hour to fill their petrol tank, and waiting for a movie to be downloaded through a little pipe is likely to be impractical, given that the pipe is also needed for other purposes.

But even that is not entirely obvious. In countries with low labour costs there are people who send a servant to do time-consuming chores like filling a car with petrol. If the time when one wants to watch a movie is discretionary, then downloading it slowly ahead of time could be an option. Thus, relative prices of related products and services, as well as incomes, influence how much speed is desired and in what circumstances.

We need to think about what it is that is being purchased when the label just says “high speed”. In the case of downloading a film to watch at leisure, high speed translates into a shorter lead time, less need for planning ahead, less need to anticipate what you will feel like watching tomorrow, more scope for impulse decisions. Different people will place different values on those consumption benefits, and have different willingness to pay for higher speeds for that purpose.

Of course, if high speeds are cheap enough hardly anyone will forgo the additional choices they afford. Dial-up is dying out, with most of the increase in broadband subscriptions coming from customers who previously used dial-up⁶.

But it is not a question of dial-up vs. broadband. The question is: how fast?

Now if we consider a different type of content being provided by broadband, the consumption characteristics and willingness to pay may be quite different. If the service provided is the transmission of x-ray or scanning images to a doctor, remote from where the image was taken from the patient, trained to make a diagnosis from the image – or it might be some other medical data – and if the making of the diagnosis is time critical, e.g. a matter of life or death, then the demand for the

⁵ It might also be noted that the analogy with pipes foreshadows, and risks pre-empting, discussion about market power, since it is typically uneconomic to duplicate a transmission pipeline or set of distribution pipelines.

⁶ ACMA, *Telecommunications Today, Consumer Choice Preferences in Adopting Services*, May 2008.

service, including the speed of transmission, might be quite different from that for a movie download.

Even then, demand will be determined in part by the purchaser's budget constraint. Indeed, there is a question of who is the purchaser: is it an individual, or a health insurance fund, or a government, or an employer who doesn't know that an employee is downloading movies and taking them home to watch?

Note, also, that the assumption that the diagnosis was time-critical was crucial. Moreover, the availability of a doctor to receive and react to the information sent is assumed.

The upshot of looking at these simple examples is that speed or bandwidth or information carrying capacity cannot be considered usefully in isolation from what type of information is being carried, the way in which the information will be used, the type of user, and who is paying.

We can make some very general statements:

- Higher speeds will create more options for producers and consumers of information.
- Quantity demanded of a broadband service will depend on its price. That goes for each aspect of the service, e.g. access (subscriptions), volume of information, and speed of delivery. The price may well be for a product that combines all those characteristics, and possibly other things, and is set to cover the costs of those things in a manner that is unknown, and possibly of no interest, to the purchaser.
- Elasticity of demand will depend on the nature of the service, on income, etc. The little information that is available at the level of broadband penetration (subscriptions per capita) on a country-by-country basis does not provide consistent results for elasticity of demand with respect to income (GDP per capita), and there is even less information about elasticity with respect to price⁷. And it does not tell us about elasticities at the individual level for subscriptions or speed or volume.

We may be able to say that no matter how fast broadband becomes, applications will be developed that can use those high speeds. Whether purchasers will feel they "need" such high speeds will depend on price, and hence on the cost of supply, but also, as already mentioned, on the type of use, user, etc.

One thing we can be sure of is that defining broadband as 256 Kbps is already on the way to seeming archaic. (Incidentally, as speeds have increased and are measured in Mbps, the link of their derivation to the binary or octal bases of computing, and hence to powers of 2, becomes less obvious.)

In early April Telstra was reported as claiming that the rest of the world was moving towards 100 Mbps, with Australia being left behind⁸.

⁷ See Richard Cadman and Chris Dineen, *Price and Income Elasticity of Demand for Broadband Subscription: A Cross-Sectional Model of OECD Countries*, 07 February 2008, and Marcelo Grosso, *Determinants of Broadband Penetration in OECD Nations*, ACCC staff paper, September 2006.

⁸ Reported comments of Telstra executive Phil Burgess, e.g. <http://www.cnet.com.au/broadband/adsl/0,239035934,339288102,00.htm>: 'Despite speeds of 20Mbps, Australia is still behind, Burgess said: "This is great in Australia, but... the rest of the world is going to 100Mbps." "If Australia doesn't wake up, we're going to be in bad trouble," he added.'

Services – What do users purchase?

The discussion of speed throws some light on the nature of broadband. But if we are to understand the markets involved, we need to think about broadband services more in terms of services and products that are bought and sold rather than as technologies.

In differing circumstances, such as whether we are focussed on Internet access or more broadly, customers may be offered services in varying forms and bundles and by various combinations of entities.

A retail customer will consume at least two of the following separately identifiable services:

- A carriage service that provides fast, i.e. broadband, delivery of information to the customer premises.
- An Internet access service, provided by an ISP, together with a right to download a certain volume of information. These may or may not be bundled under a single price. This allows free access to a vast amount of information services (where “information” is broadly defined). The information is free but downloading it is not.
- Individual Internet content services from paid sites accessed through the ISP and typically by means of a browser in the same way as free content is accessed, e.g. online music stores, Internet radio and Internet video (the latter generally on demand).
- Other content services such as IPTV that may be delivered by an ISP via a PC (e.g. by TPV, an ISP operating in several cities) or by the carrier that provides the carriage service, typically via a managed IP connection to a set-top box (e.g. Transact in Canberra) or conceivably by some other entity or entities. In all cases some entity will need to undertake content aggregation and management, service management, rights management, and delivery of information to a head end. (IPTV can provide both linear services (including near video on demand) and true video on demand.)

Thus broadband services delivered to retail customers typically include Internet access, but do not always do so. A customer may be able to get IPTV without Internet access.

Moving on from retail customers, specialised services such as distance health and education would also in general not be provided using the public Internet.

The common feature of all broadband services is a delivery mechanism, i.e. a carriage service. This brings us fair and square into familiar territory: access to the customer via the wireline local loop or by some other means.

Market power – Where does it come from?

If the local loop exhibits market power characteristics – more correctly, if the provision of telecommunications to customers via the local loop exhibits market power – then we can say that that is the source, or at least one source, of market power in the provision of broadband.

As always in thinking about market power, we have to consider the time dimension, i.e. we have to speculate about, or should I say carefully analyse, what is likely to happen in the future, given the current state of events.

The future will depend greatly on the outcome of current processes involving direct government intervention to develop a National Broadband Network (NBN), and on any consequential changes in the system of regulation. However, those developments are set aside for the moment so that we can consider the underlying market forces.

The present existence of market power in the wireline local loop is undeniable. One carrier, Telstra, owns the vast majority of all the access lines in Australia. The impact of that market power is moderated by regulation, e.g. rights of access to those lines under certain terms and conditions through the access provisions of the Trade Practices Act. But the existence of the underlying market power is clear. That market power may be strengthened by the joint ownership and provision of carriage services and Internet access, and by the ownership of content, especially if the content is exclusive, and especially if it is accessible only via the Internet access service (BigPond) linked to the carriage service.

Even if substitutes were available and market entry were easy, the current dominance of one provider would mean that there is, at present, strong market power in the provision of broadband services. That market power could be simply the legacy of a prior statutory monopoly that for some reason has not yet broken down. Or it could be due to natural monopoly characteristics in the local loop. In that sense the source would matter not at all to the fact of the existing market power.

However, in the absence of natural monopoly characteristics, if substitutes are available and market entry is not too difficult, we would expect the power to diminish reasonably quickly. That is why we have to consider what will happen over time. Is the current market power likely to be sustained?

What will happen over time depends on technical engineering matters such as economies of scale and scope, and combined economic and technical matters such as the availability of substitutes.

Telstra has stated publicly that only it can provide the ultra-high speed broadband speeds that it says customers will demand⁹. Prior to the government initiatives of the last year to invite proposals for the building of a broadband network, Telstra had said that it would roll out FFTN only if it were given a regulatory holiday¹⁰.

This sounds awfully like sustained market power. If we accept those claims, then that's the end of the story, for now and for some considerable time into the future.

But perhaps that is too gloomy a picture: gloomy if you prefer the prospect of competition. There are other providers of carriage services used for access to broadband services.

First, consider **wireline competition**, setting aside government interventions and the possibility of changes to the regulatory framework. There have been limited overbuilds of Telstra's access network, notably in central business districts of capital cities, but also in some other geographic areas¹¹. But the only substantial alternative networks are the hybrid fibre/coaxial (HFC) cable of Telstra and Optus. Together

⁹ Communications Day, 14 April 2008.

¹⁰ Paul Budde Communication Pty Ltd, *2007 Australia - Broadband Market - Overview and Statistics*. Abstract accessed from <http://www.marketresearch.com/product/display.asp?productid=1506331&g=1>.

¹¹ TransACT's VDSL network in the ACT and Neighbourhood Cable's HFC network in Ballarat, Geelong and Mildura are important but localised examples.

these provide services to less than 20 per cent of broadband subscribers¹². The share is partly a function of the limited coverage of the HFC cable networks – although that coverage is quite extensive – and partly of the fact that penetration is well under half of premises passed by the cable.

HFC networks, despite their costs to date being sunk, face costs for connecting each new subscriber. This includes a visit to the customer premises by a technician and inconvenience for the subscriber as it requires making an appointment and being present at the appointed time.

As a consequence, for new broadband customers Optus is reported now to be using regulated access to provide DSL over Telstra copper, even where its HFC cable network duplicates the copper¹³. Unless the regulated wholesale price Optus pays for access to the unbundled local loops is too low, this would seem to indicate that the business case for DSL broadband is inherently superior to that for HFC broadband, given the existing installed networks. It is said that Telstra subscribers similarly favour DSL over HFC broadband where they have the choice.

The HFC networks are not subject to access regimes and their operators do not provide wholesale access, so there is no downstream competition at the retail level. For wireline, this leaves us with downstream competition using the incumbent's copper local loops¹⁴.

At present, competition depends on regulated access using the unbundled local loop service or the line-sharing service. Certainly this competition places a constraint on the incumbent's retail services, but only through the existence of the access regime. Because of it there are multiple providers of DSL services from many, but far from all, exchanges. Indeed, Telstra originally provided ADSL2+ services only where a competitor had first installed equipment in an exchange¹⁵.

Apart from wireless technologies, which we will come to shortly, any further competitive constraint on Telstra's wireline broadband services at the wholesale level, and hence at the retail level, depends on the possibility of a new form of bypass of Telstra's local loops. Until a technology such as broadband over power lines becomes feasible, if it ever does, the current situation appears to be indefinitely sustainable.

Now, consider **fixed wireless broadband**.

We need to return to the question of speed.

For wireless to provide ultra-high speeds requires shorter and shorter wireless links, which come at greater and greater expense. Thus in most settings there will be some speed at which wireless technology is, and will remain, far more expensive than wireline technology.

¹² See Table 1d. Broadband subscribers per 100 inhabitants (Dec. 2007) at <http://www.oecd.org/sti/ict/broadband>.

¹³ Comment by Richard Chirgwin, Communications Day, 31 March 2008.

¹⁴ There is the possibility, however, of HFC provision of broadband taking on new impetus with impending regulatory changes – see below.

¹⁵ Telstra Media Release, 10 November 2006.

If Telstra is correct about the high speeds that are going to find applications and be demanded by customers at the prices at which they are offered, it must follow that those services are going to have to be provided by wireline.

Despite these doubts, fixed wireless seems certain to be able to deliver satisfactory broadband services of many kinds, and to be economic in some geographic locations. However, for the vast bulk of the population it has to compete with the dominant wireline broadband service. For the bulk of the population this wireline service has inherently greater carrying capacity both in the short-term (ADSL2+) and, as discussed, in the long-term if ultra-high speeds come into play.

Even at lower speeds – and you can do a lot with 12Mbps – fixed wireless operators face formidable hurdles if they are competing head-to-head with the wireline incumbent, as they will be doing except in some rural and remote areas. This is particularly the case if additional customer premises equipment (CPE) is required and cannot be installed by the customer, so that a visit to the customer by a technician is needed. Not only is this costly, but it has the same inconvenience to customers that makes them reluctant to switch to HFC.

A fixed wireless entrant has the additional disadvantage vis-à-vis a wireline operator that the latter has the sunk costs of a near-ubiquitous copper network and economies of scope as well. In addition, customers are generally bound to their current provider by contract.

On the other hand, fixed wireless broadband could be attractive where it is available over distances greater than those over which DSL can be provided, especially if no specialised installation service is required. A wireless environment inside the premises could also be attractive.

Crucially, wireless broadband needs access to spectrum. The spectrum with the most desirable characteristics for wireless propagation is likely to be in high demand for other applications as well.

Fixed wireless has an important place in the telecommunications future, including in provision of broadband, but it is hard to gauge the degree to which fixed wireless entry can provide a substantial competitive constraint in major population areas.

Finally, we consider **mobile wireless broadband**. An initial thought was that it is likely to be inferior in speed to fixed wireless, so we could dismiss it. However, that may be incorrect.

It is easy to be somewhat sceptical about the use of mobile handsets for Internet browsing ever taking off in a big way, and many of the mobile 3G applications had the appearance of speculative gimmicks looking for a market rather than real user needs being satisfied in a new way. (There is nothing wrong with speculative gimmicks. It's just that they are risky investments.)

However, use of mobile broadband for connection of laptops – and also PCs – to job-related applications such as company intranets appears to be growing, offerings are multiplying and prices are coming down. It is true that the speeds are not great by the standard of what we keep getting told we are missing out on and are available overseas, and capped download limits are not generous. However, the speeds are faster than we could get on wireline services only a relatively short time ago, and the download limits are similarly comparable to those recently offered via wireline. Higher speeds are promised shortly.

In fact, mobile broadband seems to be fulfilling a genuine user need.

Moreover, the mobile operators already have large customer bases and do not have the problems of persuading new customers to adopt an unfamiliar technology or

make an appointment to start a new service, and prising them out of their current contracts may also be less difficult. Mobile subscribers are used to shopping around when their contracts expire – if they have contracts. Customers can themselves install new equipment needed.

A significant issue is the availability of spectrum for the further development of wireless services. The expected freeing up of premium spectrum from the closure of analogue television services will be a key event.

Finally, and very importantly, the mobile operators have healthy revenues from voice and SMS; and these revenues are not under threat, as the voice revenues of wireline operators are. For voice services, mobile telephony is fast becoming more than an adequate substitute for wireline telephony¹⁶. Mobile handsets offer far greater functionality. And there are other services, such as EFTPOS transactions, that are growing, do not need broadband, and may migrate from wireline networks. VoIP is also a threat to wireline voice revenues. In fact, however, Telstra's traditional wireline revenues have so far held up well.

There is at least a question whether wireline broadband will have things all its own way. While mobile broadband cannot and will not be able to serve all types of broadband demand economically, it may provide increasing competition in segments of the market. Nevertheless, the overall picture is one of continuing dominance by the incumbent's wireline network, bolstered by improvements in the services offered over that network.

Recall again that this discussion abstracts from any changes to the regulatory framework and from the impact of direct government involvement such as large-scale public investment¹⁷.

We should now consider whether there are other sources of market power in the provision of broadband services. I have suggested that the market power associated with controlling the dominant form of carriage of information could be increased by control of an ISP and of content. Could this work the other way?

As already mentioned, some ISPs and at least one competitive carrier are getting into the business of providing IPTV, both "free" and by separate payment. This may be a strategy to boost customer numbers rather than revenue per customer, at least in the short term.

But it is hard to see how an ISP or competitive carrier could develop any significant countervailing market power unless it had exclusive access to very attractive content or, more generally, a very attractive application.

In addition, there are considerable barriers faced by an ISP or smaller carrier trying to establish attractive IPTV or Internet video services. Deploying an IPTV service involves large upfront costs including additional CPE and network upgrades. Ongoing costs include backhaul, which many claim is a major problem¹⁸. It is not clear that IPTV can be viable except with a large subscriber base in place.

¹⁶ Survey data show that more than a quarter of consumers who have both fixed and mobile services would consider replacing their fixed service with another form of communication – ACMA, *Telecommunications Today, Consumer Choice Preferences in Adopting Services*, May 2008.

¹⁷ Small-scale public investments such as by local governments or even State governments are not likely to change the overall picture, and are not associated with changes in the system of regulation.

¹⁸ See, for example, ACMA, *IPTV and Internet Video Services*, April 2008, page 22 and Comment by Pipe MD Bevan Slattery, Comms Day, 4 April 2008.

Most carriers and providers are not experienced in content acquisition (negotiation with content providers) or, possibly, in ongoing management of CPE. Content providers who already have established channels of distribution may not see much benefit in dealing with small operators.

By contrast, the dominant carrier may be able to increase its market power in carriage services through vertical integration of the value chain – linking the carriage service with an ISP and add-ons such as an Internet portal. Even then, exclusive access to content probably matters more.

Regulation – Do we need a new approach?

All that said, broadband does not present any radically new issues for access regulation, although the type of access will be different and other types of regulatory issues do arise. The movement of fibre closer to premises removes existing opportunities for physical interconnection.

With a full next generation IP-based network (NGN) and FTTN or further, there will be no scope for an unbundled local loop service, i.e. it will be physically impossible for competitors to lease access lines to customers. This will also, of course, result in the stranding of competitors' equipment in exchanges. Competition will depend on the degree to which the infrastructure operator provides wholesale products to competitors to allow downstream competition. It will also depend on the nature of those wholesale products. These matters will in turn depend on the regulatory framework.

The present situation consists of a range of interconnected legacy networks, by far the largest of which is the previous monopoly incumbent's. Using regulated access rights, competitors provide differentiated broadband services over access lines owned by Telstra, using a range of technologies.

This competition is steeped with all the usual disputes between access providers and access seekers, including sabotage, a topic that was discussed at a previous conference¹⁹.

Even in the absence of government intervention there is no doubt that the network transformation alluded to above will occur because, on the one hand, such investments are necessary to reduce costs in the longer term, and on the other, since the trend is global, maintaining old telephony switches is going to become impossible as suppliers withdraw support.

There is an undeniable tension between the legitimate interests of the access provider in upgrading its network by reducing the amount of copper, e.g. so as to provide better services and reduce maintenance costs, and the interests of access seekers in having certainty about their investment in exchange equipment. However, the network transformation is inevitable and inexorable. The stranding will occur. Given the reported short payback times for this equipment, that may be less than a tragedy.

Setting the speed of the transformation aside, the future is for an NGN that will necessarily preclude competition in the provision of the physical access medium²⁰.

¹⁹ Sabotage is defined as non-price discrimination by a vertically integrated regulated firm against its unintegrated downstream rivals in T. Randolph Beard, David L. Kaserman and John W. Mayo, *Regulation, Vertical Integration and Sabotage*, The Journal of Industrial Economics, September 2001. The topic was discussed at the 2005 ACCC regulatory conference.

This future could be reached by the playing out of market forces together with the present form of access regulation. The usual processes by which markets muddle their way forwards with competing investment by various players, some of which prove to be unsuccessful, would get us to the NGN future – but evidently not quickly enough to satisfy all.

The outcome would probably have been a number of variously-owned and operated interlinked IP-based networks, but with the access network reverting to even greater control by Telstra except where other carriers already have customers directly connected by fibre or FTTN.

However, policy-makers decided that faster action was needed. Both major political parties made it their policy to ensure that fast broadband was rolled out to almost all the population, and the current Government has specified that this should be achieved by a FTTx network.

This policy approach appears to be motivated by a combination of concerns about equity of access to services and belief in the positive externalities available from such a network investment.

It is true that access regulation is not equipped to deal with equity concerns of this nature, and it can be argued to have contributed to delay by Telstra in making investments. Access regulation is designed to promote competition in downstream markets where there is market power upstream²¹.

However, the present framework of access regulation appears to be capable of dealing with access to wholesale services in an NGN, e.g. bitstream services, provided in the transport layer. That framework is already couched in terms of services rather than network elements, and is quite flexible. However, it may turn out that specific provision needs to be made for applications services as a new category in addition to carriage services and content services. One assumes policy makers have that under notice.

In any case, the fact that services will be provided by applications and that the applications need not be hosted in Australia does raise regulatory issues. A whole panoply of regulatory provisions hang on the definitions in existing legislation of a standard telephone service and of a carriage service provider, and they may prove difficult or impossible to apply to applications provided via an overseas server/service provider.

The issues range from provision of locational information for emergency calls to interception of calls by security agencies. Much of the present regulatory framework, although not much of the access regulation framework, relates solely to voice calls, which have no special place, at least in a technological sense, in an NGN. Indeed, many of the new regulatory issues relate to whether and how voice services should be made “special” in an NGN environment.

Moreover, migrating voice services to a fully IP-based network raises difficult issues and will require great care. As just one example, will the powering of handsets

²⁰ The distinction between an IP-based core network and a FTTx access network has sometimes been blurred in this discussion and below, with the term NGN being used to cover both, but the commercial drivers are for both developments to occur contemporaneously.

²¹ While competitive outcomes do not necessarily meet the community’s equity objectives, there is a lot to be said for competition as a force for equity in commercial opportunity. Competition regulation, properly conducted, can only cause postponement of efficient investment where the regulated firm has such market power, and such expectations of being able to achieve higher returns through lobbying, that it can rationally forgo normal returns on the investment for a period.

through the network cease? Would the community and the Government accept the loss of this “lifeline” aspect of the existing voice services?

Returning to the motivation for government intervention to achieve a rapid national broadband upgrade, it is not altogether clear why equity concerns should express themselves in terms of providing equal access to services. There are very many services that are not equally available to all citizens, most obviously because not all citizens have equal purchasing power. The tax/transfer system is generally agreed, at least in principle, even if the practice shows many departures from principle, to be best placed to deal with income inequalities, allowing individuals then to make their own choices about the goods and services they purchase in the light of their incomes and the prices of those goods and services. That is, it is generally agreed that interfering directly in the prices of the goods and services is far from optimal.

Similarly, direct government involvement in how the services are provided is less than optimal, although there are plenty of examples of government involvement in the provision of, for example, housing, whereas for some reason direct government involvement in the provision of basics such as food and clothing is less common in Australia.

Because of where they live many potential library users cannot effectively get to a library, or enjoy the services of a masseur to alleviate muscular strains, or have access to dozens of other services, because the population density where they are located is insufficient to sustain the provision of such services.

It would not seem particularly remarkable if people in some localities were not to have access to some of the services provided by high-speed broadband, just as it is certain that some people will not be able to afford all of the other services on offer, wherever they happen to live.

It is to be hoped that there will always be a range of services and transmission speeds and prices that will provide a range of service packages – content bundled with a particular speed of delivery – from which customers will select; but not all customers will face exactly the same choices and prices.

The other argument for government involvement to bring about a more rapid deployment of high-speed broadband services is that Australia would be foolishly forgoing the benefits to be had from such a deployment if it waited for market forces to operate. This may be combined with an expectation that large positive externalities are expected.

Almost any investment can provide positive externalities. If BHP builds or expands a port so as to export more minerals, many people benefit apart from BHP shareholders. Going back in history, the building of the railways in the 19th Century United States must have provided massive positive externalities, despite the ability of the backers to capture huge benefits for themselves, for example by means of increases in land values.

But no-one argues that all large investments automatically qualify for government assistance, whether in the form of finance or of various forms of “facilitation”. (It is no doubt true that few large investments are contemplated without at least an attempt being made to garner government assistance.)

Indeed, it is far more common for consumer benefits to be postponed – and hence reduced – because government action prevented investment taking place. Think of the delayed introduction of television, of colour television, of subscription television. Think of the explosion in telecommunications investment that had to await the removal of a statutory monopoly.

Many of those consumer benefits have come through competition, but many have come simply from the introduction of services that it was previously unlawful to provide, though they were common in other countries.

Nevertheless, where the introduction of services appears to be unduly delayed, certainly the appropriateness of regulation should be reviewed. In general, one area where regulation may be justified is in setting technical standards, although this is not a primary concern in the timing of the upgrade of broadband services..

Why the greater deployment of high-speed broadband was delayed in Australia, if indeed it was unduly delayed, and how long that delay would have continued are now academic questions. What seems to have led to the bipartisan view that government intervention was needed is that Telstra was taken at its word when it announced that it would not build the new network – or undertake the network upgrade, depending on how you look at it – unless it was provided with a guaranteed rate of return and protection from access regulation that would otherwise apply. (Note that access regulation is not peculiar to telecommunications, but applies to all essential infrastructure in Australia, as indeed it does in most developed countries.)

That presented the unwelcome prospect of a return to monopoly provision of wireline telecommunications services, with a private monopoly in place of the public monopoly of less than two decades ago. While there have been calls for a return to government ownership, at least of the access network, the major political parties have taken the view that a long march from government monopoly to government monopoly was not the way to go.

The alternative now in prospect is still somewhat unclear, but appears to be some sort of hybrid centrally planned network developed partly by government fiat and with a large injection of public funding.

It might be a public-private partnership or a government subsidy to a private investor. Apart from many other difficulties, it might be expected that the risks faced by Telstra in being the main non-government investor would be lower than for any other possible investor. This would mean other investors' required rate of return would be higher unless, perhaps, the government takes on a large part of the risk.

As a final point, it needs to be remembered that broadband-capable HFC networks already exist in our largest cities. If some entity other than Telstra were to gain the right to provide the NBN, then its investment could be put further at risk if Telstra turned to its HFC broadband option. Perhaps Telstra could be prevented from doing so by statute or perhaps some form of commercial accommodation could be reached. Whoever develops the NBN, mandated restrictions on infrastructure competition seem inevitable, which will make competition among applications providers all the more vital.

Conclusions

There are many aspects to regulation of telecommunications in Australia. An access regime provides the basis for competition in downstream markets where an access provider has market power in an upstream market – a bottleneck. Most notably, this provides for competition where an incumbent controls most of the access lines between exchanges and customers.

A number of interconnected networks have grown up with a mixture of facilities-based competition and service-based competition including resale. One thesis of this paper is that the current access regime could deal with the new issues that arise with the development of broadband. Those issues involve mainly the move to a fully IP-

based network with the replacement of copper access lines by fibre to, or close to, customer premises.

With this development, interconnection will become less important and some of the legacy networks may fade away. This would have occurred haphazardly and over a period of time, with the withering of infrastructure competition but with competition in the provision of services by means of applications able to be fostered through the access regime. The access regime may have needed to be modified, but it appears broadly flexible enough already.

However, this is not going to happen. The sticking point was timing. The incumbent's market power, which was never reduced by the access regime but only its effects moderated, enabled it to delay investment. This led to impatience with the speed of infrastructure upgrade needed to provide very fast broadband to most of the population quickly.

To make this happen, some major changes to the access regime appear inevitable. These could include restraints on overbuilding and/or guaranteed rates of return higher than those strictly necessary for the requisite investment to be undertaken in a competitive market. There is some irony in returning to legislative protection of a single operator in circumstances where economies of scale and scope seem to provide natural protection.

But the access regime is only one part of the regulatory framework. Other aspects of regulation will need to change as well. The provisions relating to voice telephony are already under pressure – i.e. there are difficulties in applying them – because of the emergence of Voice-over-Internet-Protocol (VoIP) services. These difficulties will be greatly magnified in a fully IP world. The Australian Communications and Media Authority (ACMA), which is responsible for these aspects of regulation, has referred to “broken concepts”²².

Finally, regulatory decisions in other areas – using the term broadly to refer to decisions of the Government, some of which culminate in legislative change as well as those of regulatory authorities – will have a major bearing. One of those areas will be the allocation of spectrum.

Thus the final conclusion is somewhat ambivalent. Even had the existing access regime been left in place, network developments would have required new regulatory approaches in some areas such as voice services. It is those network developments, which are largely but not entirely driven by broadband, rather than broadband *per se*, which require new approaches. It is the desire to see those network developments take place faster than they otherwise would have, so that broadband services can be provided sooner and more widely, that has put the framework for competition regulation in a state of flux.

22 See, for example, Chris Chapman, *The flexibility benefits of Australia's co-regulatory approach*, speech by ACMA Chairman to the 14th European Conference of Postal and Telecommunications Administrations (CEPT), Strasbourg, France.