

Applying the ladder of investment in Australia

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'All happy families are alike, but an unhappy family is unhappy after its own fashion'
Tolstoy'

1. Introduction.

As with families, so it is with electronic communications services, where the legacy of past investments creates a path dependency which confronts national regulators with different kinds of unhappy observations, or more realistically, with a range of different perplexing observations in different geographical areas.

This paper is concerned with one particular manifestation of this - the application to Australia of an influential approach to the encouragement of infrastructure competition known as the 'stepping stones' or 'ladder of investment' hypothesis (the latter term will be used here throughout). According to the positive or descriptive part of this hypothesis, competitors challenge an incumbent by offering services which rely, as their market share rises, less and less on the incumbent's assets and more and more on their own. Thus competitors progressively build out their networks closer and closer to their customers. This descriptive hypothesis is accompanied by a normative proposition, that regulators should use the instruments available to them to encourage this process. The underlying goal is thus to achieve the maximum feasible level of infrastructure competition, but falls short of encouraging inefficient entry.

The normative component of the 'ladder of investment' has been adopted by a number of regulators and governments: by the European Regulators Group (ERG) and by many national regulators in Europe, and by the New Zealand Government in its 2006 stocktake of telecommunications regulation and subsequent legislation.¹ The ACCC also has written of the benefits of maximising economically efficient infrastructure competition and of the role of the ladder of investment in achieving that outcome². This is despite the fact that the ladder of investment theory remains no more than a hypothesis, as scientific testing of an imprecise proposition of this kind remains problematic.³

¹ See the ACCC Fixed Services Review, second position paper, April 2007, p iii: '[economically efficient facilities-based competition] allows rivals to differentiate their services and compete more vigorously across the greater elements of the supply chain.'

² ACCC Fixed Services Review, second position paper, April 2007 at p.21.

³ There are several studies of the impact on broadband penetration of a settled policy of making or not making resale, bitstream or ULL products available. But the ladder implies a shifting rather than a settled access policy, as the regulator will change its policy towards a particular access product as investment takes place.

In this paper, I first set out in Section 2 a version of the normative hypothesis. Section 3 briefly discusses how it has been applied in Europe, in the context of both current and next generation voice and broadband. I then outline in Section 4 the roles of end-to-end competition and of the reliance on access products in the Australian broadband market.

The key departure in Australia from practice elsewhere is the behaviour of the major infrastructure competitor in Australia, which Optus, in areas where it has built out its own end-to-end HFC network, capable of providing both narrowband and broadband services, nonetheless chooses to rent unbundled loops from Telstra as well as using its own installed network. Optus appears to “dual source” with its HFC footprint: sometimes connecting customers to its own network and sometimes using regulated access services.

In other words, Optus is stepping down a rung in the ladder of investment, and limiting the scope of its competition with Telstra. I am aware of no other local network competitor which dual sources in this way. I examine the reasons why Optus may have adopted this policy, one of which is likely to be the price set by the ACCC for Unconditioned Local Loop Service (ULLS) in Australia or ULLS. However, as I also discuss, adjusting the ULLS price is unlikely to completely solve the problems which appear to have arisen in Australia.

This dual sourcing behaviour risks thwarting the ACCC’s objectives vis-à-vis infrastructure competition –which would seem naturally to entail encouraging competitors to develop and use their facilities where they exist, and the promotion of access-based entry only where they do not. Accordingly, Section 5 considers how alternative remedies might incorporate necessary adaptations to the ladder of investment to meet the unique circumstances for the ladder’s application which have emerged in Australia.

2. *The ladder*

In an earlier paper⁴, I set out how regulators can encourage infrastructure competition by creating incentives (positive and negative) for operators to build out closer to customers, investing successively less replicable assets. This account is based on the normal circumstances in which access is sought by a competitor which has not already constructed an end-to-end network in the geographical area in which it is seeking access – a case which I consider in Section 4 below.

In summary, the steps involved – as set out in the earlier paper – are as follows:

Step 1: Rank replicable components of the value chain for relevant products by their ease of replicability as described above. This involves evaluating empirical evidence or modelling of cost structures.

Step 2: Identify where on the ladder all firms (incumbents and entrants) are now located. In this respect, the paper notes the following:

“The problem is that different entrants will be at different stages of development of infrastructure competition. Some will have made substantial investments, but

⁴ M Cave ‘Encouraging infrastructure investment via the ladder of investment’, *Telecommunications Policy*, 2007, pp223-237.

may not be strong in terms of market share and expectations of profitability. Others may be just starting. It might be practically feasible (though difficult) for the national regulatory authority (NRA) to fabricate a different set of incentives for each entrant, based upon its current position. However, this would be (a) probably illegal, as it would breach restrictions on non-discrimination which apply both to the regulator and to firms in the market place and (b) counterproductive, as the existence of privileged arrangements for late comers will have the opposite effect to that intended, by slowing down the process of competitive investment.

This imposes on the regulator the task of choosing the point on the Ladder at which the intervention should still be applied. This decision will be based on an analysis of the scale and prospects of the operators at various points, with a bias in favour of what might be described as 'leading competitors', defined as those more advanced in their infrastructure building and satisfying a minimum market share criterion.

This approach may appear harsh to later entrants, whose arrival on the scene may be associated with less favourable access conditions-the relevant assets being deemed, by that stage, to be replicable. However, such later entrants will have the opportunity to seek access either from the initially dominant firm or from earlier entrants, which may have excess capacity which they are eager to sell. Indeed competition may even have become 'effective' in the relevant market, precluding any sort of regulatory intervention [under the European Directives]"

Step 3: Having identified the rung in the ladder at which intervention should be focussed, it is then necessary to determine the likely investment potential of actual and potential entrants at that point. In order to make this determination, the NRA will have to quantify the scale of the investment required by competitors to develop their infrastructure. This will require careful judgement.

Step 4: Choose the mode of intervention, which can be by price or quantity instruments-in other words, either based upon rising access prices (relative to costs), subject to a short transition period where necessary, or upon the projected withdrawal of mandatory access.

There is an extensive economic literature on when price and quantity instruments should be applied, focussing upon the damage which might arise from a mistaken intervention. Where replicability is relatively certain, withdrawal of mandated access may be the better approach. (I consider below what might be done if local access network infrastructure has in fact already been replicated, as is the case in Australia.)

Step 5: Calibrate the intervention. If mandatory access ceases, that is equivalent to making a significant and sudden change in the price of access to a level which would be commercially negotiated between the access provider and access seeker. This would be infinite if access is not made available, (but qualified in the case of Optus under discussion below, which has the option of self-supply). The variable within regulatory control is thus the date on which mandatory access ceases.

If a price-based approach is chosen, this can rely upon the well-understood theory of option pricing, which is an extension of basic investment theory. According to that basic theory, investment will occur when its expected return is at least as great as the project's cost of capital, where that cost of capital includes an adjustment for risk. It may seem that an access charging regime based on long-run incremental cost (LRIC) plus common cost, using an appropriate asset-specific cost of capital, would then send the correct 'make or buy' signals to other operators. However, this ignores the fact that competitors whose access is mandated always have the option of continuing to buy. Undertaking an investment in conditions of uncertainty and sunk costs carries a risk which makes the option of continuing to buy access more attractive, especially if the access product is available on favourable terms. To persuade a competitor to invest, the access price must cover the competitors' cost of supply and the value of the option. By similar reasoning, if the incumbent when making the original investment is relieved by the prospect of higher access prices of the fear it will have to assume some of the competitor's business risk, by offering access to sunk investment at cost-based prices, it is more likely to make the investment in the first place.

Step 6: Make a credible commitment to the policy.

It is noteworthy that this approach requires active management by the regulator: it is not a policy of continuous 'easy access', but one of 'tough love' in which competitors are chivvied up the ladder by price incentives or the expectation of withdrawal of the more comprehensive access products corresponding to the lower rungs of the ladder. It is likely to be the case that competitors will have a natural incentive to delay investment as long as possible, particularly if they believe that access prices will continue to improve. Regulators will need to consider whether at some point a decision to cease mandating supply of a regulated access product, following a notice period, may prove more effective.

Consistency in the management of the ladder is also important. Incentives to move up the ladder can be muddled if pricing for individual access services (i.e. separate rungs on the ladder) are re-set in isolation with limited analysis of their inter-relationship with the pricing of other services on the ladder.

3. Application of the ladder in Europe

In terms of outcomes, it is obviously difficult to untangle the effects of applications of the ladder from those of other regulatory policies. The United Kingdom presents a good example. In June 2005, Ofcom announced a commitment by BT to cut its local loop prices by 40% and to maintain the existing margin between the price of unbundled loops at the then most popular bitstream product until 1,500,000 loops had been unbundled. In the 28 months which followed, the number of unbundled loops grew from less than 100,000 to 3.5 millions. But there was also a simultaneous and substantial improvement in BT's poor provisioning processes, which in the UK context was undertaken as part of the introduction of operational separation, a policy introduced to deal with problems which I understand have been largely avoided in Australia, as the ACCC has found no significant or systematic discrimination by Telstra between its retail and wholesale

customers. There is clearly no easy way of estimating the relative contributions of the policies introduced in June 2005, or whether, in complementary fashion, each was necessary to achieve the outcome in terms of an increased number of unbundled loops observed in the UK.

Aggregate data for the 15 members of European Union in 2003, shown in Table 1, indicate the degree to which the composition of competitive broadband changed in the EU between 2003 and 2007.⁵

Table 1. ADSL Competitors' Use of Broadband Access Products (EU15) –millions (% shares in brackets)

	2003	2004	2005	2006	2007
DSL subscribers	12.5	22.5	40.8	56.4	68.2
Competitors' DSL subscribers	2.8	6.9	16.5	25.0	31.3
based on					
- resale	1.5 (54)	2.3 (33)	4.9 (30)	9.1 (36)	8.2 (26)
- bitstream	0.7 (23)	2.4 (35)	4.6 (28)	3.9 (16)	5.4 (17)
- ULL	0.7 (23)	2.1 (31)	6.9 (42)	12.0 (48)	17.6(56)

Source: EC Implementation reports 2004-7; Broadband report 2007.

These data show that –at the level of description – the centre of gravity of access has moved in favour of ULLS, to the detriment of both resale and bitstream. This transition was acknowledged as a policy objective by the European Regulation Group, and by several European regulators, notably ARCEP in France.

The ladder policy is also implicitly supported by a major feature of the regulatory regime in the EU which makes it unlawful to regulate markets which are effectively competitive. At periodic market reviews, held every 2-3 years, each NRA conducts an analysis of competition in a list of markets set out in a European Commission Recommendation.⁶

A number of analyses have found the wholesale broadband analysis (bitstream) market to be effectively competitive and hence ineligible for regulation. In the Netherlands, there was ubiquitous cable service, and three or four operators had installed DSLAMs in large numbers of KPN's exchanges. In Malta, there were ubiquitous telecommunications and cable networks. The NRA's original analysis found them to be jointly dominant but,

⁵ These data are taken from M. Cave, *The regulation of access in telecommunications: a European perspective*, April 2007, which also reviews some econometric evidence on the impact of access regimes on broadband take up.

⁶ The first Recommendation in 2003 listed 18 markets, while the 2007 version has listed seven markets. Both lists contain wholesale broadband access and unbundled local loops as markets suitable for *ex ante* regulation.

following doubts raised by the Commission, notified the market as being effectively competitive.

There is also evidence that EU regulators in markets without ubiquitous alternative networks are recalibrating regulation to take account of the presence of alternative networks in 'pockets'. The standard test for a geographical market – homogeneity of competitive conditions within it – tends to yield national markets when there is a 'patchwork quilt' of areas with different endowments of infrastructures, which are, however, united by a uniform retail price imposed by the regulator on the incumbent in the Member State in question. But this story generally does not work for broadband, the retail price of which is not regulated. In such circumstances, there is a strong argument for permitting differentiated geographical treatment, either at the stage of market definition or of remedies. The feasibility of doing this has been demonstrated in New Zealand, where the geographical scope of access regulations change almost in real time, as competitive build out occurs.⁷

In the UK, Ofcom is consulting on an analysis of wholesale broadband access which identifies separate geographic markets, characterised by different conditions of competition and proposes to 'exempt' BT from the obligation to supply the product in certain areas. This last notification is likely to be one of several which, in effect, establish simultaneously different 'ladders' in different areas within a Member State.

This apparent success of the European access model is, however, overshadowed by doubts about whether the ladder approach can be maintained in the same or a similar form as next generation access (NGA) networks are installed. The architectures of such networks differ from those of the PSTN, creating different opportunities for unbundling them. While access to a fibre to the node (FTTN) or cabinet (FTTC) network is available at the sub-loop, and also via a national bitstream product, it seems highly unlikely that the access at the local exchange, the point of origin of ULLs, will survive. Regulators have responded to this in various ways.⁸ In my opinion, this development places greater emphasis in the future on the importance of promoting competition between end-to-end networks, as against the access-based model described above. In many countries, the most likely source of NGA competition is the existing cable network. The best outcome for consumers would be a race to upgrade to NGAs between the incumbent telco deploying FTTN or FTTC networks and the cable operator moving to DOCSIS 3, which supports much higher speed and higher quality services. The role, configuration and duration of the ladder of investment in this rapidly changing environment needs to be carefully considered. As Ofcom has recently acknowledged in its NGA Consultation Paper, it is not acceptable simply to roll forward regulatory solutions from the current

⁷ For business customers, TelstraClear Wholesale Determination, 12 May 2003, <http://www.comcom.govt.nz/IndustryRegulation/Telecommunications/Wholesale/WholesaleDeterminations/telstraclear.aspx>; and for residential customers, TelstraClear Residential Wholesale Determination, 14 June 2004, <http://www.comcom.govt.nz/IndustryRegulation/Telecommunications/Wholesale/WholesaleDeterminations/telstraclearresidentialwholesalede.aspx>.

⁸ Contrast the approaches taken by OPTA in the Netherlands where KPN is installing an NGA, by Ofcom in the UK, where there are as yet no such plans, and by ARCEP in France, where there is a focus on sharing ducts to promote competitive networks.

environment, including the ladder of investment as we have previously conceived or applied it.

4. *Broadband competition in Australia*

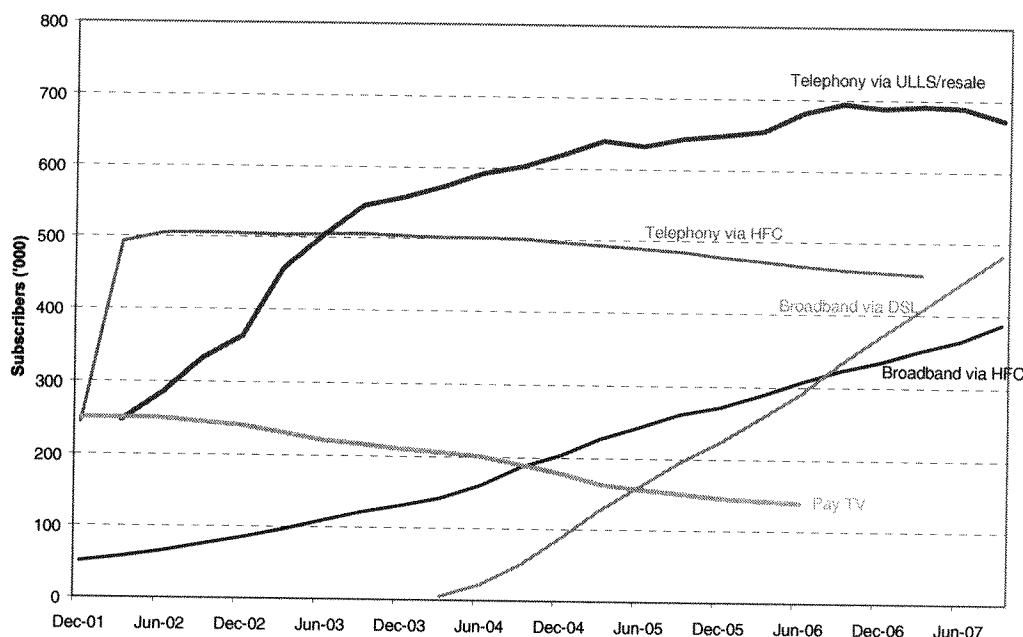
The focus of this paper is on appropriate regulatory policy in geographical areas where competing operators have end-to-end networks at their disposal. In this regard, Telstra's chief competitor is Optus in the three biggest cities, Melbourne, Sydney and Brisbane. Optus has an HFC network which is capable of supplying the triple play of entertainment services, fixed broadband and fixed voice. The Optus network was built before the ULLS was declared by the ACCC. Optus supplies customers using its own network where it exists, and also use Telstra's loops –both inside and outside the areas served by its HFC network. Other carriers and ISPs also provide service to a growing number of broadband customers within and without the areas covered by the Optus HFC network. Some broadband customers receive service from wireless providers, both fixed and mobile.

The proceedings to which this paper is intended to contribute concern a proposed exemption from Telstra's obligation to provide wholesale services, including ULLS, at regulated prices in specified areas, corresponding to those covered by the Optus HFC network which currently has the choice of either using its own network or of buying Telstra's ULLs at a regulated price of \$14.40 per month in band 2.

I have been shown data which suggest that, within the areas served by its networks, Optus has met its customers need from the two sources in the proportions shown in Figure 1, which demonstrates that Optus' use of regulated access is growing at a significantly faster pace than its on-net connections⁹. I am informed that Telstra estimate that there is almost 80% overlap between the Telstra exchange areas in which Optus has deployed its HFC and where it has deployed DSLAMs, including in exchange areas where Telstra believes that Optus has 100% HFC coverage.

⁹ Although regulated access is not restricted to Optus' cabled areas, as on-net customers are.

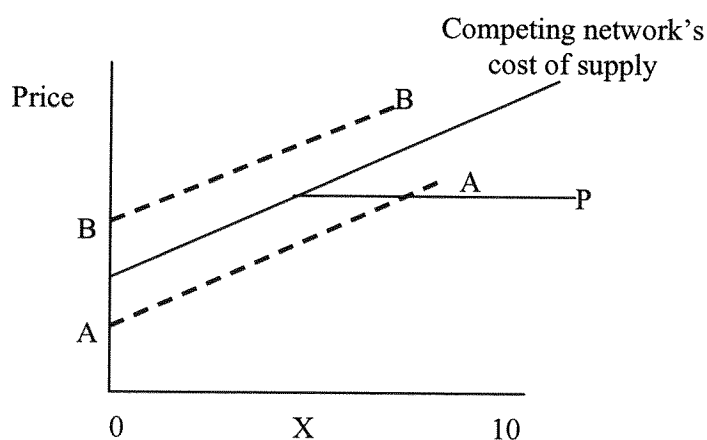
Figure 1: Customers of SingTel Optus' Voice and Broadband Services, by platform, Dec-01 to Sep-07



Source: Ergas, H. (2005) *Can Telstra be Privatised?* presented at the Industry Economics Conference, 29 September 2005, La Trobe University, Melbourne, Australia, as updated by CRA International from SingTel, 'Management discussion and analysis of financial condition, results of operations and cashflows' for periods 2002 – 2007; IBISWorld.

The behaviour recorded above is highly unusual. I am not aware of any historical precedent of a network owner choosing on an apparently permanent basis to serve customers in its own area on this scale using the incumbent's unbundled loops, although ULLs are frequently deployed to serve customers outside the network service area. It is thus necessary to speculate why the 'dual sourcing' policy is adopted. I focus in particular upon two explanations. The first stems from cost difference in serving different customers. The forward-looking incremental cost of serving a set of customers using the competing operator's own loops will be distributed as shown in Figure 2 (where for convenience it is assumed that the distribution is uniform).

Figure 2



If the operator has access to Telstra's loop at a uniform price of \$14.40 in band 2 (P in the figure), it will choose to serve customers up to index X with its own loops, and rent Telstra's loops for the remainder. In other words, the dual sourcing may simply reflect the consequences of a variable cost of self-supply and a constant regulator-set price of renting loops.

The implications of this in terms of static efficiency clearly hinge on the relationship between Telstra's resource cost of supplying loops and the competing operator's own costs. However, even if the cost to Telstra's of supplying loops fall below those of the operator (as indicated in the dotted line AA in figure 1), the dynamic benefits of infrastructure competition may still make it desirable to maintain network duplication.

Such dynamic benefits are the reason for the preference expressed by many regulators, including the ACCC, for infrastructure competition, and are thus, explicitly or implicitly, given great weight. In present circumstances, when a new generation of access networks is at the stage of design or early implementation, the benefits of infrastructure competition may be especially large, as I argue below.

Secondly, in order to replace Telstra's loops with its own, the competitor may have to incur avoidable investment costs. These would be associated with such activities as

- making the final drop to newly connected premises
- serving multi-dwelling units
- strengthening the upstream network.

In Optus' case, its business policy (as reported by the ACCC in 2006) on use of Telstra's loops has the effect of eliminating over 35% of the customers in its service area (0.8 million out of 2.2 million) from being serviced by HFC¹⁰. This may reflect the fact that it

¹⁰ Senate Economics Legislation Committee. *Answers to Question on Notice. Treasury Portfolio*. Additional Estimates 16 February 2006, Question AT 47.

does not find it profitable to make the investments necessary to supply these customers with its own loops.

I am not able to gauge the level of investment involved to serve alternative numbers of additional customers. But clearly the investment would be subject to risks, whereas the option of purchasing Telstra's loops at \$14.40 in band 2 avoids that risk. To persuade a competitor to invest, the access price must meet the competitor's costs plus the value of the option of deferring the decision whether to invest (see pp 4-5 above). If this is large, it will shift the own-supply cost to the dotted line BB in figure 1, thus curtailing investment. This is not necessarily inefficient in a static sense, but the curtailment of investment clearly has consequences for the scope of competition, discussed below.

There may be other explanations for the dual sourcing policies pursued by Optus, including those associated with longer term strategies for gaming the regulator, or with short term capital constraints, or with expectations of further falls in the access price, but I do not consider these further here.

To summarise, the competitive environment for broadband in Australia exhibits what I believe is a unique feature: the decision by end-to-end competitors to supply a significant number of their customers on the basis of loops rented from the incumbent, in preference to relying on their own loops. This conduct, which can be described as a partial stepping down from the pinnacle of the ladder of investment – full end-to-end competition – coincides with the conduct of ISPs without end-to-end networks making early attempts to gain broadband customers, also using Telstra's loops. This state of affairs raises unusual issues for the ACCC.

5. *Alternative policies for Australia*

The ACCC is required to base its decisions on mandating access on the basis of the long term interests of end users (LTIE) test, the long term interests of end-users, via the objectives of promoting competition achieving any-to-any connectivity and encouraging the economically efficient use of and investment in infrastructure. In practice, such objectives may involve conflicts between the promotion of service, access-based and infrastructure competition and between short-term and longer-term goals.

In relation to the current regulation of broadband in Australia, it is possible to identify several policies which further the objectives noted above in various degrees. These are:

- A. maintenance of the *status quo* – i.e. an obligation on Telstra to provide local loops at \$14.40 per month or whatever the prevailing regulated price is from time to time (in band 2 areas) to all access seekers.
- B. the abandonment of a requirement to provide local loops in areas where competing end-to-end networks exist; in those areas the renting of loops would become a matter for commercial negotiation.
- C. An obligation to provide local loops to operators without end-to-end networks, but no obligation to supply operators in areas where they have such networks (Telstra's proposed exemption).

For the purposes of this paper, I do not consider other possible options, including changes in the price of ULLS. While an increase in the ULLS price may moderate the

extent of the behaviour, it seems likely to persist. In any case, it can be argued that an operator which has built out a full network in an area should not expect to have regulated, mandated access to a competitor's network at any price. Regulated access has fulfilled its purpose under the ladder theory, at least in relation to that entrant.

In undertaking the analysis, I focus on the three dimensions of performance relating to competition and investment in relation to both current generation and next generation access networks, omitting for these purposes the possible beneficial effects of greater competition in voice services. The three dimensions are:

the impact on competition for current generation broadband;
the implications for the development of next generation access networks; and
the long-run effects on incentives in the market.

A. Maintaining the *status quo*

The consequences of maintaining Telstra's current obligation to supply local loops to all parties, including those with their own networks, is likely to be, first, a continuation of Optus' dual sourcing policy, which I would expect rationally to be based on a comparison of the costs of the make and buy options, (though as noted above, other motives may be in play as well). Although ULLS prices in Australia are different across the geographically de-averaged bands used by the ACCC, it is clearly impractical to extend that variation to allow the prices of providing loops to different premises to reflect the costs of serving each place, even though higher levels of granularity than a simple rural/urban distinction might be practical.

Accepting this constraint, the question, then becomes: what are the effects of this outcome in terms of the various kinds of economic efficiency. If Telstra's incremental cost of service to any location were always lower than its competitors', then productive efficiency would require setting an access price which caused all premises to be served by Telstra's loops. In practice, the relationship between Telstra's and its rivals marginal costs is likely to be complex. In these circumstances, it may be impossible to do more than conclude that the policy has unpredictable effects on productive efficiency.

It is reasonable to suppose that the regulated ULLS price feeds through into retail prices charged in the Australian broadband market place, and for the purposes of allocative efficiency this is a good reason for seeking to set ULLS prices, where access to ULLS is mandated, in line with their marginal (or, in practice, forward-looking incremental) costs.

Finally, there is the effect on dynamic efficiency, especially via competition and innovation. It is recognised by the ACCC that 'competing forms of standalone infrastructure allow different providers to have greater control over their own costs and supply chain as well as a greater ability to improve services and differentiate service offerings. In turn this is more likely to lead to sustainable competition and improved services over time.'¹¹

¹¹ Speech by Michael Cosgrave, Group General Manager, Communications Group, ACCC, *The regulation of Australia's broadband market*, 21 August 2007.

Reliance by competing network operators on Telstra's ULLS must in some degree curtail product differentiation, thus imposing a partial loss of the dynamic benefit of infrastructure competition. This loss can be attributed to the impact on investment incentives, noted in sections 2 and 4 above, of the 'guaranteed price' buy option represented by a mandated access product. To be persuaded to invest in such circumstances a competitor must not only be satisfied that the proposed investment yields a rate of return which exceeds its cost of capital, but that it does so by a margin which exceeds the benefit represented by the option of postponing sunk investment while continuing to enjoy the certainty of access to the mandated product. I make no attempt to estimate the value of this option – to do so requires estimation of the relevant risk parameters. But past estimates have suggested that the value of the option may be high.¹²

In summary, the reasoning above suggests a likely continuation of the 'dual sourcing' policy on the part of Optus and a very limited incentive to invest in its own network. This has led and will lead to a diminution of the arena of competition and hence to a loss of dynamic efficiency. That loss of dynamic efficiency is associated not only with decreased investment by Optus, but also with reduced incentives for Telstra itself to invest, rather than milk its existing assets.

B. Removal of Telstra's obligation to supply ULLS in areas with duplicated fixed networks

In the European regime described above, it is unlawful to impose regulation in markets which are effectively competitive – i.e. not characterised by significant market power or dominance. It would follow that if, in any identified market, characterised in terms of the service provided and the geographical area in which it is supplied, an unregulated end-to-end retail market were effectively competitive, there would be no basis for mandating access to any wholesale product in the corresponding value chain.

In the case of analysis of a wholesale market, it would be appropriate to take account of both services supplied to third parties (e.g. local loops provided to ISPs), and to self-supply (i.e. cases where an operator supplied its retail customers using its own loops).¹³

It is also worth pointing out that an access provider may choose to meet the needs of an access seeker even if it is not required by a regulator to do. Agreement on commercial terms are commonplace in both the communications sector and elsewhere. Australia is clearly not bound by the same legislation as Europe, but the ACCC must nonetheless reach conclusions on similar access matters in the light of its own legislation and administrative practice, which would in any case would prevent Telstra from engaging in any anti-competitive refusal to supply.

It is possible to observe the consequences of a policy of large scale withdrawal of access obligations in the United States, where the obligation on the telecommunications incumbent to supply access services to competitors has sharply diminished since 2004.

¹² See Cave *op. cit.* in fn.3 p. 234.

¹³ The roles of third party and self supply in promoting downstream competition are explored in R. Inderst and T. Valletti, 'Market analysis in the presence of indirect constraints and captive sales', *Oxford Journal of Competition Law and Economics*, 2007, pp203-231.

As a result, the broadband market has effectively turned into a duopoly, with the addition of limited competition from wireless providers.

I have not attempted to conduct a competitive analysis of broadband (and related) markets in the areas of Australia for which Telstra seeks an exemption. But it seems clear that:

- in terms of relative size, endowment with network assets and competitive strengths, the comparative positions of Telstra and Optus in those areas of Australia is different from the more evenly matched relationship between AT&T and Verizon and the major cable companies in the United States;
- the risk of triggering the exit from the relevant Australian markets of small operators starting to 'climb the ladder of investment', and of increasing the chance of a duopoly in the short to medium term is a considerable one;
- it would probably not be safe to rely on wireless broadband operators to impose much of a competitive constraint on a wire-based in the short term.

For these reasons, I provisionally conclude that abandoning all access obligations in the relevant areas places at risk the long term interests of end users (LTIE)., because wholesale competition may not emerge in a timely or sufficient way.

C Implementing a policy of exempting Telstra for supplying access to ULLS to operators with their own networks in the relevant area

This involves an access policy which discriminates among operators with different endowments, and hence contradicts the argument for a non-discriminatory policy made at pp3-4 in section 2 above. In other words it recognises that a bespoke solution may be needed for the bespoke problem which has arisen in Australia.

What are its likely effects? The following assumes that the policy is implemented after a lag, to permit those operators which would be denied access to implement alternative strategies.

In relation to current generation broadband, the key issue is the response of a competitor with a network. The policy is intended to encourage it to undertake economically efficient investments (with a positive net present value) which it has previously decline to undertake in favour of the option of waiting. If it were to invest, the result would be a deepening of infrastructure competition. If it did not, and if also it did not negotiate access with Telstra on commercial terms, its customers connected via Telstra's loops would have the option of switching either to Telstra or to an ISP still able to rent Telstra's loops or other wholesalers buying services from Telstra and ULLS acquirers. Such a transfer would be unlikely to lead to service degradation, but it might weaken marginally retail competition in broadband, though this effect would be mitigated by the presence almost everywhere of one or more DSLAM providers and resellers, as well as Telstra. It is also noteworthy that Optus faces a further incentive to maintain its customer base in the fact that many of its customers buy a bundle of wireless and wireline services. This will create additional incentives for Optus to retain its wireline customers, rather than sacrifice them to competitors.

In immediate terms there is then the prospect of higher investment, leading to enhanced competition among operators and the prospect of greater dynamic efficiency, purchased at the cost of what is likely to be a comparatively small loss of productive efficiency. Against this must be balanced the risk of no new investment and, perhaps, a slight reduction of competitive pressure. Evaluating these risks requires a detailed knowledge of cost data, which is only likely to be available to the ACCC, but it is nonetheless possible to comment, below, on the likely scale of the risks.

The second consideration proposed above for the evaluation of the alternative policies is the likely impact on next generation broadband, especially the roll out of fibre-based access networks. I noted above that the different architectures of such networks will probably preclude access at certain points currently available, such as the local exchange.¹⁴ In the first place, this casts some doubt on the long term value of investments made by competitors in the local loop. As the network is redesigned and the local exchange assets are stranded, regulators may come under pressure to make costly arrangements to compensate competitors, even though the likely development of technical change has been as well known to them for several years as it is to others. Secondly, access at the sub-loop may be technically feasible, but it is questionable whether it is technically feasible everywhere (because of congestion problems) and questionable whether a competitor could gain a sufficient number of customers in the area served by any but the busiest subloops to justify the investment. This is likely to place greater emphasis on competition between end-to-end networks as the most effective means of addressing any concerns about the remonopolisation of telecommunications services. In areas where two networks exist, there is the prospect, however, of end-to-end competition between operators with their own access networks. It is not hard to envisage circumstances where this would be in the long term interests of end users.

In my opinion, these gains are more likely to be realised in Australia if there already existed two networks each with an infrastructure capable of providing service to (almost) all the premises in an area, thus permitting a convergence of market shares. This would make competitive investment in next generation access networks more likely and reduce the probability of there being a need for long-term regulation in that area, with all its attendant costs.

It can be argued, as noted in Section 2 above, that a discriminating access policy will create disincentives for investment in the future: an operator will fear that if it invests, it (and it alone) will be forced to negotiate for access on commercial terms, or be denied access, (a future version of bitstream, for example) which continues to be available to other competitors which have undertaken less infrastructure investment. This is a serious issue, but one which I believe a regulator could resolve by clearly limiting the set of circumstances in which such an exceptional policy could be adopted. It would be confined to circumstances, such as the present one, in which an operator had constructed for itself nearly all the assets permitting it to self-supply, but none the less sought access products from a competitor which was broadly equivalently endowed. Such a statement of intent would, if it were believed, prevent the routine application of different access arrangements for different operators. Alternatively, or additionally an Optus-specific

¹⁴ See also M Cave *op. cit.* in fn 4..

exemption can be presented as the precursor of a review of the obligation with respect to other operators at some future date based on market developments, including as a result of this exemption.

To summarise, the ACCC is dealing with an unusual situation in which there has been substantial investment in competing end to end networks, but the investor has nonetheless chosen to have recourse to Telstra's loops even in areas covered by its network. This leads to conflicts with the ACCC's preference for end-to-end competition.

The motives for the 'dual sourcing' policy adopted by Optus may be various, but to the extent that they are based on exploiting imperfectly calibrated access charges and avoiding investment costs, as discussed above, the current regulatory regime has the effect of curtailing the scope of competition in current generation broadband, and is likely to diminish the scope for the duplication of next generation access networks in areas with existing duplicative structures.

Can these outcomes be avoided? In the current competitive situation, the case for fully dismantling the access regime seems premature. There is, however, the option of adopting the discriminatory access regime described above. Whether it would work depends crucially on how the operator with competitive network reacts. If the competitor simply withdrew from serving their existing clients, there would be no gain in competition and, possibly, a small diminution in competitive pressure in the broadband market. But if the competitor responds by further investment in the connection to premises already passed by its network, there would be the gain in competition described above.

The ACCC is in a position to gather information from Optus about its HFC network and its practices in using access and from Telstra about Optus' use of wholesale services. This would allow the ACCC to definitively determine what is actually happening on the ground. However, in my opinion, in view of what is at stake, and of the balance of upside benefits of enhanced dynamic competition versus the downside risks of reduced competition, it is likely that this option is likely to benefit consumers in the long run.

There would be a further collateral losses associated with adopting the discriminatory policy- the possible deterrent effect on infrastructure investment in the future, on the part of operators which will fear that their access to products will be removed if they invest. The regulator should be capable of dealing with this issue by emphasising the unusual nature of the current situation and disclaiming any intention to do the same except in similar highly unusual (and unhappy) circumstances.

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Education

BA, First Class, Philosophy, Politics and Economics, Balliol College, University of Oxford, 1969

BPhil in Economics, Nuffield College, University of Oxford, 1971

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Academic Employment to Date

1971-1974	Research Fellow, Centre for Russian and East European Studies, Birmingham University.
1974-1987	Lecturer and Senior Lecturer, Department of Economics, Brunel University.
1981-1982	Visiting Associate Professor, Department of Economics, University of Virginia.
1987 to 2001	Professor of Economics, Brunel University.
1988 to 1994	Head, Department of Economics, Brunel University.
1989 to 1994	Dean, Faculty of Social Sciences, Brunel University.
1994 to 1996	Pro-Vice-Chancellor, Brunel University.
1996 to 2001	Vice-Principal, Brunel University.
2001 to date	Professor and Director, Centre for Management under Regulation, Warwick Business School, University of Warwick.

Journals

Member, Editorial Board –

Economics of Education
European Journal of Law and Economics

Member, Advisory Board - *Communications and Strategies*

Advisory and Consultancy Experience for Government Organisations*

Appointed independent director of **UK Payments Council** (supervising the development of payment systems in the UK) 2007-2010

Appointed by **Department of Communities and Local Government** to conduct independent review of the regulation of social housing. 2006-7

Appointed special adviser to the **European Commissioner for Information Society and Multimedia**, 2006

Adviser to **OFGEM** from 2005

Appointed by **Chancellor of Exchequer** to conduct review of major spectrum holdings, December 2004- November 2005.

Adviser to **Lord Chancellor's Department** on legal deregulation 2004-5.

Vice-Chair, **Guernsey Utility Appeals Tribunal**, from 2004

Ofcom Spectrum Advisory Board (OSAB), Member from 2004.

Ofcom: Economic Advisor, from 2003

DEFRA regulatory task force, member, 2003

OFWAT Non-Executive Advisory Director, 2002 -2006

Appointed by **Chancellor of the Exchequer and the Secretary of State for Trade and Industry** to prepare an independent report on spectrum management, March 2001 – March 2002

Postal Services Commission: Adviser from 2000.

Civil Aviation Authority. Adviser 2000-2003.

Spectrum Management Advisory Group, DTI, member 1999-2003

French Ministry of Finance (1999) Member, Groupe d'Expertise, electricity grid pricing.

Competition Commission Member, (1996-2002).

Office of Utility Regulation (Jamaica) Economic Adviser (1998-2000).

OFGAS (1994 – 1999) Member of OFGAS Panel of Economic Experts, to advise the Director General of Gas Supply on a variety of economic issues relating to regulation of the industry.

Office of Fair Trading (1990-1992 and 1995-9) Acted as Broadcasting Adviser to the Office of Fair Trading in matters relating to the regulation of networking arrangements for the television

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industry (1990 to 1992). Adviser on BSkyB Inquiry (from 1995-96). Expert witness for DGFT (1998-1999).

French Ministry of Posts and Telecommunications (1991)

Member, Groupe d'Expertise – advisory committee on universal service and interconnection.

Ministry of Agriculture, Fisheries and Food (1993-1996). Adviser to the Ministry on appropriate procedures for tendering for the decommissioning of the fishing fleet.

HM Treasury (1986-1990) Economic Adviser undertaking advisory work on a consultancy basis for the Public Enterprise Analytical Unit and the Economics of Industry Division involving participation in the design of regulatory regimes for the water and electricity supply industries during privatisation. Secretary to an Inter-Departmental Group reviewing the discount rate and rates of return in the public sector.

Home Office (1985-1986) Consultant to the Committee on financing the BBC, chaired by Sir Alan Peacock. Advice on cost and revenues.

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Referees


Sir Ian Byatt,
Chair, Scottish Water Commission

Nigel Stapleton
Chairman, Postal Services Commission

STATEMENT of Professor Martin Cave

On 17 December 2007, I, Martin Cave, Scarman Road, University of Warwick, Coventry CV4 7AL, United Kingdom, say as follows:

- 1 I am the Director of the Centre for Management Under Regulation at the University of Warwick in the United Kingdom.
- 2 I was retained Peter Waters & Associates as an independent expert in this exemption application.
- 3 I was provided with a copy of the Guidelines for Expert Witnesses in Proceedings in the Federal Court of Australia (**Guidelines**), a copy of which I have included in my report, and I have prepared my report in accordance with the Guidelines.
- 4 The factual premises on which I have based my statement are the descriptions of the deployment areas of the SingTel Optus HFC network and data on the number of Exchange Serving Areas in which SingTel Optus has ULLS and HFC infrastructure provided to me by Peter Waters and Associates, which are set out in the Telstra submission which is Schedule A to Telstra's exemption application.
- 5 I have made all the inquiries that I believe to be appropriate, having regard to the instructions of Peter Waters and Associates.
- 6 Exhibited to me at the time of signing this statement is a copy of my report dated 17 December 2007 which has been prepared for the purposes of these proceedings.


Martin Cave

Dated: 17 December 2007

Filed on behalf of the Seventh, Eighth and Twenty-First Respondents by:

GILBERT + TOBIN

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Federal Court of Australia



Guidelines for Expert Witnesses in Proceedings in the Federal Court of Australia



This replaces the Practice Direction on Guidelines for Expert Witnesses in Proceedings in the Federal Court of Australia issued on 11 April 2007.

Practitioners should give a copy of the following guidelines to any witness they propose to retain for the purpose of preparing a report or giving evidence in a proceeding as to an opinion held by the witness that is wholly or substantially based on the specialised knowledge of the witness (see - **Part 3.3 - Opinion** of the *Evidence Act 1995* (Cth)).

M.E.J. BLACK

Chief Justice

6 June 2007

Explanatory Memorandum

The guidelines are not intended to address all aspects of an expert witness's duties, but are intended to facilitate the admission of opinion evidence (footnote #1), and to assist experts to understand in general terms what the Court expects of them. Additionally, it is hoped that the guidelines will assist individual expert witnesses to avoid the criticism that is sometimes made (whether rightly or wrongly) that expert witnesses lack objectivity, or have coloured their evidence in favour of the party calling them.

Ways by which an expert witness giving opinion evidence may avoid criticism of partiality include ensuring that the report, or other statement of evidence:

- (a) is clearly expressed and not argumentative in tone;
- (b) is centrally concerned to express an opinion, upon a clearly defined question or questions, based

on the expert's specialised knowledge;

(c) identifies with precision the factual premises upon which the opinion is based;

(d) explains the process of reasoning by which the expert reached the opinion expressed in the report;

(e) is confined to the area or areas of the expert's specialised knowledge; and

(f) identifies any pre-existing relationship (such as that of treating medical practitioner or a firm's accountant) between the author of the report, or his or her firm, company etc, and a party to the litigation.

An expert is not disqualified from giving evidence by reason only of a pre-existing relationship with the party that proffers the expert as a witness, but the nature of the pre-existing relationship should be disclosed. Where an expert has such a relationship the expert may need to pay particular attention to the identification of the factual premises upon which the expert's opinion is based. The expert should make it clear whether, and to what extent, the opinion is based on the personal knowledge of the expert (the factual basis for which might be required to be established by admissible evidence of the expert or another witness) derived from the ongoing relationship rather than on factual premises or assumptions provided to the expert by way of instructions.

All experts need to be aware that if they participate to a significant degree in the process of formulating and preparing the case of a party, they may find it difficult to maintain objectivity.

An expert witness does not compromise objectivity by defending, forcefully if necessary, an opinion based on the expert's specialised knowledge which is genuinely held but may do so if the expert is, for example, unwilling to give consideration to alternative factual premises or is unwilling, where appropriate, to acknowledge recognised differences of opinion or approach between experts in the relevant discipline.

Some expert evidence is necessarily evaluative in character and, to an extent, argumentative. Some evidence by economists about the definition of the relevant market in competition law cases and evidence by anthropologists about the identification of a traditional society for the purposes of native title applications may be of such a character. The Court has a discretion to treat essentially argumentative evidence as submission, see Order 10 paragraph 1(2)(j).

The guidelines are, as their title indicates, no more than guidelines. Attempts to apply them literally in every case may prove unhelpful. In some areas of specialised knowledge and in some circumstances

(eg some aspects of economic "evidence" in competition law cases) their literal interpretation may prove unworkable. The Court expects legal practitioners and experts to work together to ensure that the guidelines are implemented in a practically sensible way which ensures that they achieve their intended purpose.

Guidelines

1. General Duty to the Court (footnote #2)

- 1.1 An expert witness has an overriding duty to assist the Court on matters relevant to the expert's area of expertise.
- 1.2 An expert witness is not an advocate for a party even when giving testimony that is necessarily evaluative rather than inferential (footnote #3).
- 1.3 An expert witness's paramount duty is to the Court and not to the person retaining the expert.

2. The Form of the Expert Evidence (footnote #4)

- 2.1 An expert's written report must give details of the expert's qualifications and of the literature or other material used in making the report.
- 2.2 All assumptions of fact made by the expert should be clearly and fully stated.
- 2.3 The report should identify and state the qualifications of each person who carried out any tests or experiments upon which the expert relied in compiling the report.
- 2.4 Where several opinions are provided in the report, the expert should summarise them.
- 2.5 The expert should give the reasons for each opinion.
- 2.6 At the end of the report the expert should declare that "[the expert] has *made all the inquiries that [the expert] believes are desirable and appropriate and that no matters of significance that [the expert] regards as relevant have, to [the expert's] knowledge, been withheld from the Court.*"
- 2.7 There should be included in or attached to the report; (i) a statement of the questions or issues that the expert was asked to address; (ii) the factual premises upon which the report proceeds; and (iii) the documents and other materials that the expert has been instructed to consider.

2.8 If, after exchange of reports or at any other stage, an expert witness changes a material opinion, having read another expert's report or for any other reason, the change should be communicated in a timely manner (through legal representatives) to each party to whom the expert witness's report has been provided and, when appropriate, to the Court (footnote #5).

2.9 If an expert's opinion is not fully researched because the expert considers that insufficient data are available, or for any other reason, this must be stated with an indication that the opinion is no more than a provisional one. Where an expert witness who has prepared a report believes that it may be incomplete or inaccurate without some qualification, that qualification must be stated in the report (footnote #5).

2.10 The expert should make it clear when a particular question or issue falls outside the relevant field of expertise.

2.11 Where an expert's report refers to photographs, plans, calculations, analyses, measurements, survey reports or other extrinsic matter, these must be provided to the opposite party at the same time as the exchange of reports (footnote #6).

3. Experts' Conference

3.1 If experts retained by the parties meet at the direction of the Court, it would be improper for an expert to be given, or to accept, instructions not to reach agreement. If, at a meeting directed by the Court, the experts cannot reach agreement about matters of expert opinion, they should specify their reasons for being unable to do so.

footnote #1

As to the distinction between expert opinion evidence and expert assistance see *Evans Deakin Pty Ltd v Sebel Furniture Ltd* [2003] FCA 171 per Allsop J at [676].

footnote #2

See rule 35.3 Civil Procedure Rules (UK); see also Lord Woolf "Medics, Lawyers and the Courts" [1997] 16 CJK 302 at 313.

footnote #3

See *Sampi v State of Western Australia* [2005] FCA 777 at [792]-[793], and *ACCC v Liquorland and Woolworths* [2006] FCA 826 at [836]-[842]

footnote #4

See rule 35.10 Civil Procedure Rules (UK) and Practice Direction 35 – Experts and Assessors (UK); *HG v the Queen* (1999) 197 CLR 414 per Gleeson CJ at [39]-[43]; *Ocean Marine Mutual Insurance Association (Europe) OV v Jetopay Pty Ltd* [2000] FCA 1463 (FC) at [17]-[23]

footnote #5

The "*Ikarian Reefer*" [1993] 20 FSR 563 at 565

footnote #6

The "*Ikarian Reefer*" [1993] 20 FSR 563 at 565-566. See also Ormrod "*Scientific Evidence in Court*" [1968] Crim LR 240.

Overview

In Australia, certain telecommunications services can be “declared” as regulated wholesale services by the regulator (the Australian Competition and Consumer Commission or ACCC), if the regulator determines that this would improve competition in the long term interests of end users. If a service is declared then it must be supplied to access seekers in accordance with standard access obligations and at a price based on a pricing principle determined by the regulator (for unbundled products, the pricing principle is usually Total Service Long Run Incremental Cost or TSLRIC). An exemption from the obligation to supply a declared service is available if the service is not, in effect, a bottleneck.

Peter Waters & Associates seeks expert opinion on the economic issues relating to a proposed exemption which Telstra is seeking from having to supply regulated access services to SingTel Optus within the footprint of the SingTel Optus HFC network.

Scope of work

Peter Waters & Associates wishes to retain you to provide a report covering the following questions:

- (a) what is the current thinking on the application of and success of the ladder of investment theory amongst regulators and commentators in Europe;
- (b) what is the application of the ladder of investment theory in an NGN environment;
- (c) to what extent is the ladder of investment theory consistent with a network operator with its own local access network continuing to use regulated access within its network footprint;
- (d) to what extent is the LTIE test consistent with a network operator with its own local access network continuing to use regulated access within its network footprint ; and
- (e) if you consider that there are adverse implications of a network owner using regulated access within its network footprint, the options available to a regulator in respect of regulated access and their relative advantages and disadvantages, including the proposed option of withdrawing access to the network owner and not to other access seekers.

Information to be provided by Peter Waters & Associates

We will provide to you background material on the existing networks in Australia both HFC and PSTN. We would ask that you provide your report in accordance with the Federal Court Guidelines for expert witnesses which we attach to this draft brief.