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REPORT

RESPONSE TO OPTUS SUPPLEMENTARY SUBMISSION ON INVESTMENT INCENTIVES

Draft Decision on Telstra's Access Undertaking for ULLS

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Telstra

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1. OVERVIEW

Optus' chief contention in its supplementary submission[1] on Telstra's ULLS access undertaking is that the ACCC should avoid "rapid increase in the ULLS charge" because this "would indeed significantly discourage investment". In coming to this conclusion, Optus quotes the ACCC:

> *"a significant, unanticipated rate increase may also reduce the incentive for access seekers and potential new entrants to make infrastructure-based investment such as in DSLAMs"*

In considering this contention, the ACCC must take account of key legislative criteria governing the approval of access undertakings. Notably, the ACCC must be satisfied that a proposed access undertaking adopts reasonable terms and conditions[2]. In assessing reasonableness Part XIC of the Trade Practices Act 1974 provides a number of matters to which regard must be had. These include whether the terms and conditions promote the long-term interests of end-users (LTIE), the legitimate business interests of the carrier or service provider, the interests of persons with rights to use a declared service, and the economically efficient operation of the service or a facility[3].

In assessing the long-term interests of end-users, a range of further guidance is provided in the objects clause of Part XIC, Section 152AB. This guidance provides that in assessing the LTIE regard must be had as to whether the undertaking would result in the achievement of the objectives of promotion of competition, and of encouraging the economically efficient use of, and investment in telecommunications infrastructure.

In the light of the legislative criteria, this response provides six independent rebuttals of Optus' contention:

- **Regulatory processes should not substitute for or discourage prudent commercial behaviour** - A $30 ULLS price was fully anticipatable. Consequently, Optus' failure to hedge against ULLS price uncertainty provides no basis for a late call to the ACCC to hedge for it, let alone to do so at Telstra's expense (section 2).
- **Investors in facilities should not bear access seekers input cost risks** - Allowing Optus' request does not reduce the burden of uncertainty, contrary to Optus' claim, but shifts it to full-facility investors, including Telstra. This cannot be justified by efficiency arguments, and nor does it account for the legitimate business interests of full-facility investors (section 3).
- **Departing from cost standard would promote regulatory uncertainty** - Ignoring movements in underlying input prices so as to reduce fluctuations in the regulated ULLS price creates regulatory uncertainty, harming economic efficiency, including efficient investment (section 4).

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1 Optus Supplementary Submission to Australian Competition and Consumer Commission on Telstra's Access Undertaking for the Unconditioned Local Loop Service: Response to Draft Decision, March 2009.

2 See Trade Practices Act 1974, Section 152BV(2)(d).

3 See Trade Practices Act 1974, Section 152AH.

- **Goal should be facilitating efficient investment level, not simply more investment** - Optus' claim implicitly assumes investment is good per se, but this is not so and indeed investment may be wasteful (as the ACCC has itself frequently noted). Appropriate regulation encourages efficient investment, and nothing more than that. Requiring below cost prices is inappropriate and will lead to inefficiently high investment in, and overuse of, ULLS and too little deployment and use of new loops (section 5).
- **Academic findings on 'competitive stimulus hypothesis' are based on cost-based pricing** – that is, the reports cited by Optus do not provide any support to the proposition that the negative investment consequences of below cost prices are outweighed by a 'competitive stimulus' (section 6).
- **Academic literature supports cost-based pricing, but findings are mixed on its effects on investment** - Current, peer-reviewed, literature does not support below cost prices, and nor can it be said to provide any strong evidence for the claim that even cost-based network unbundling promotes efficient investment (section 7).

2. REGULATORY PROCESS SHOULD NOT SUBSTITUTE FOR COMMERCIALLY PRUDENT HEDGING

Optus wishes to claim that a rise in the price of ULLS to $30 per month amounts to "a significant unanticipated rate increase". Yet, over several years, Telstra has been presenting evidence, based on many different approaches, that the forward-looking total service long run incremental cost (TSLRIC) of ULLS exceeds $30 per month[4]. Further, for several years, Telstra has stood ready to supply Optus the service at a price of around $30.

No doubt, there was (and is) some probability that the ACCC would not accept some or all of Telstra's reasoning, and that a price less (or perhaps even more) than $30 could eventuate. But it is not open to Optus to claim, in the face of substantial submissions to the contrary, that a $30 price amounts to an unanticipated rate increase.[5]

It is also the case that Optus was (and is) better placed than any other party to judge whether ULLS price uncertainty was a risk it was prepared to bear, and if not, what strategies would be best adopted to reduce that risk. It appears, however, that Optus did not take any substantive actions to insure against a clearly anticipatable $30 ULLS price (as a prudent firm facing uncertain future input prices might have)[6]. This suggests Optus did not consider such action to be in its shareholders' interests. There is, therefore, no basis for Optus' claim that the ACCC should step in, after the fact, and provide Optus with a regulatory hedge at Telstra's expense. Such an action would only lead access seekers to inefficiently rely on the ACCC to protect them from input price volatility, when clearly access seekers are better

[4] It is this cost standard that the ACCC has repeatedly said the ULLS' price should reflect, even if more recently it has indicated it is not wholly committed to this benchmark.

[5] See, for example, Telstra's December 2005 ULLS undertaking, http://www.accc.gov.au/content/index.phtml/itemId/743655

[6] As discussed in section 2.2 below, Optus could have engaged in a range of actions that would have hedged its risks. It did not seek out any long-term commitments of any kind with Telstra, and, if anything, appears to have shied away from using its own infrastructure (see Ergas H (2008), *Wrong Number: Resolving Australia's Telecommunications Impasse*, Allen & Unwin, Sydney, pp19-23).

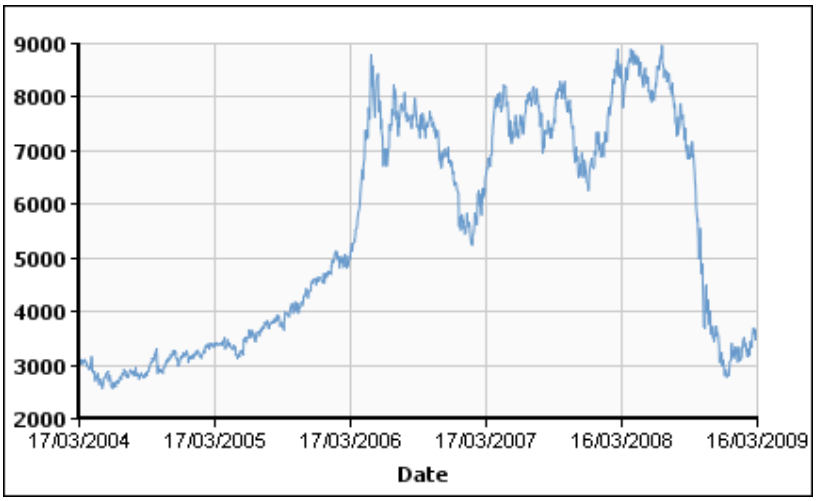
placed than the ACCC to engage in such hedges. Moreover, it takes no account of Telstra's legitimate business interests.

In what follows, two points are made. First, that input prices are generally uncertain (including wholesale prices subject to regulation), and hence successful firms (including access seekers) must employ substantial expertise in dealing with such uncertainty. This is all the more so for prices subject to regulation, since regulatory error introduces further uncertainty. Second, Optus had options for dealing with ULLS price uncertainty, but appears to have largely relied on hope or on the belief, that having failed to hedge, the ACCC would insure it from the consequences of its failing to do so. Consequently, Optus' request that the ACCC rescue it from a sudden adverse movement in ULLS prices has no merit and would merely open the ACCC to exactly the same form of moral hazard in future proceedings.

2.1. INPUT PRICE UNCERTAINTY IS UBIQUITOUS

Uncertainty is inherent in input prices and arises independently of regulatory actions. Input prices vary over time, and often in ways that are largely unpredictable. The price of copper, a key input to the cost of producing the ULLS, fluctuated widely over the course of the last 5 years—see Figure 1—often quite unexpectedly[7]. Similarly, forward-looking trenching costs change at different rates in different locations. Typically, they rise with labour costs, and in locations that become more built up or established, but they may also fall on a per line basis, for example, where old homes are demolished and replaced with high-density housing. Such price changes, even to the extent they are understood, are not readily forecast, and to the extent to which they are, those forecasts are fully built into current prices.

Figure 1 Copper Prices 17 March 2004-17 March 2009 (USD per Tonne)



Source: http://www.lme.co.uk/copper_graphs.asp

[7] As an example, in early February of 2005, GFMS Metals Consulting forecast that copper prices would average at $2,800/tonne over the year, with "a move towards $2,400/tonne as the year progresses," while the Chilean copper commission, Cochilco, forecast "that average prices in 2005 will be in a range of $2,557-2,645/tonne" (GFMS Metals Consulting increases copper price forecasts, 3 February 2005, http://www.gfms-metalsconsulting.com/Press%20Releases/Copper%20Price%20Forecast.pdf). In fact, copper never traded under US$3,000/tonne for the whole year, and closed the year in the US$5,000/tonne range (see Figure 1 in text below).

In the present case, Optus would (or at least should) also be aware that regulated prices can change, and not merely because underlying input prices change, but also because past regulatory errors may be corrected (or new ones committed) even if the regulator strives to provide a consistent principle-base price-setting process.

2.2. OPTUS, LIKE ANY COMMERCIAL FIRM, COULD HAVE EMPLOYED A VARIETY OF HEDGES AGAINST ULLS PRICE UNCERTAINTY

An obvious consequence of ubiquitous input price uncertainty is that firms everywhere must devise strategies for managing input pricing risks. To do this firms typically engage in some degree of long-term contracting where in effect input buyers and sellers commit to a price in advance, thereby providing a degree of certainty. Alternatively, in some cases they rely on self-provision.

In the case of ULLS, Optus had a range of options:

- At one extreme, Optus could solely rely on the regulatory process, in which prices ultimately would be set to the ACCC's estimate of the cost of ULL. The regulatory approach, of course, carries both commercial and regulatory risk. Commercial risk arises because the cost of ULLS likely changes over time, and could rise as compared with Telstra's commercially offered price, while regulatory risk occurs because regulatory outcomes are uncertain, including because of regulatory error (and the scope for their correction over time).
- At another extreme, Optus could have accepted the terms and conditions offered by Telstra and entirely side-stepped the regulatory process. Such acceptance would have removed the price uncertainty inherent in the regulatory process, but may have required accepting a price that was higher than what Optus expected the regulatory process to deliver. Moreover, from Optus' perspective, such an agreement might adversely influence the regulatory process.
- A third extreme would have been to hedge against ULLS price risk by developing its HFC network and/or deploying new access networks at maximal speed. This would have reduced its exposure to regulatory risk, and would have provided it with a more credible threat when negotiating ULLS prices.

Other options lay between these extremes. Optus could have sought conditioned long-term agreements, for example, a fixed price explicitly for the purpose of certainty, but which would be varied somewhat according to the ACCC's ultimate pricing decision, or lower prices in exchange for long-term fixed volume commitments. Such forward contracting would reduce price uncertainty while still allowing some reliance on the regulatory process. Other pricing arrangements may well have also been possible. At the same time, Optus could have chosen a more aggressive deployment of its HFC network than what it undertook, providing additional insurance.

In fact, it appears that Optus largely relied on the regulatory approach to the exclusion of all other strategies. This may have been a perfectly reasonable decision, but one that hardly allows Optus to claim that the ACCC should change the way it has committed to determine the ULLS' price, that is, to change the regulatory process, because Optus chose to rely on it.

3. FACILITY INVESTORS SHOULD NOT BEAR ACCESS SEEKERS' WHOLESALE INPUT PRICE RISKS

Optus' recommendation that the ULLS price be set below costs to avoid a "rapid increase in the ULLS charge" does nothing to reduce the burden of pricing uncertainty. Instead, it arbitrarily passes more of that burden on to full-facility investors.

In a competitive market, any unexpected rise in the costs of supplying a service like ULLS would result in ULLS price rises. This generally would be costly to both suppliers and purchasers of ULLS, who would both incur costs to reprice their final output and adjust output levels downwards. However, the extent of those losses would significantly depend on the extent to which the different parties had protected themselves against unexpected price movements.

A regulatory intervention, such as that proposed by Optus, that did not allow the ULLS price to fully reflect production costs, only holds the ULLS price down (it does not change the cost of providing ULLS) . Thus, assuming for simplicity that access seekers could obtain all the inputs they desired at the below cost regulated price (which in fact access regulation requires, but which would not be the case in a competitive market), the regulatory intervention would lower the price risks that ULLS purchasers face and greatly amplify the risks that ULLS suppliers face. Access seekers would face a lower, and hence more manageable, price rise than what would have occurred without the intervention. In contrast, access providers would face the full increase in costs, and would not merely have to manage these, but would have to do so while supplying ULLS at a price that does not recover those costs.

The situation is identical in the present case. The ACCC has indicated that it intends to set ULLS prices to a cost standard. All parties would therefore plan on the basis of their best expectation of what price that cost standard would dictate. If that cost standard were to deliver an unexpectedly high price (and in this case, the $30 ULLS price cannot be said to be unexpected—see section 4 above) and the ACCC were to impose a price that was lower than what the cost standard would dictate (increasing regulatory uncertainty—see section 4 below), then:

- the unexpectedly higher price determined by the cost standard (or the realisation that the previous price was too low) is not changed at all; instead
- what is changed is that the ACCC has unexpectedly deviated from its cost standard; and
- as a result, access seekers are better off and full-facility investors, including Telstra, worse off than otherwise would have been expected if the cost standard had been applied.

In short, the regulatory action has not reduced the price as determined by the cost standard (for example, due to the realisation that previous prices understated costs), but rather has merely protected access seekers at the expense of full-facility investors. This does not amount to a reduction of uncertainty, but to a shifting the burden of dealing with uncertainty away from access seekers and toward full-facility investors.

Further, while the proposed action may encourage access seeker investment (whether such investment will be efficient is discussed in section 5 below), it will inefficiently discourage investment by full-facility investors, including Telstra and access seekers who would otherwise invest in facilities. The proposed policy raises the risks any full-facility investor must bear, because ULLS prices will not reflect the costs of supplying local loop if those costs rise sufficiently. This caps retail prices and hence returns on full-facility investment. Further, such a cap is not accounted for in the weighted average cost of capital (WACC) afforded to the regulated access provider, since the cap would truncate the distribution of returns violating the assumptions of the CAPM model used by the ACCC and Telstra to determine the WACC.

That is, any claim that the proposed policy of setting prices below cost would increase investment by access seekers, regardless of whether this would be efficient, must give some account of lost investment in loop, as well as of how the policy takes account of the legitimate business interests of facility investors, including Telstra.

In summary, failing to ensure the ULLS price reflects costs so as to prevent "unexpected" price rises does not reduce risk, but instead transfers it from access seekers and to access providers. Accepting such a policy would appear to violate the legitimate business interests of access providers for no gain, but rather probable long run efficiency losses. After all, even if setting the ULLS price below costs did not result in inefficient levels of ULLS purchases and access seeker investment (and there is no reason to think that consumption or investment based on prices that do not reflect cost would be efficient), it would reduce efficient investment by access providers.

4. DEPARTING FROM COST STANDARD TO AVOID PRICE IMPACTS WOULD PROMOTE UNCERTAINTY

A policy aimed at preventing a "substantial, rapid increase in the ULLS charge" not only fails to reduce price uncertainty, but it increases regulatory uncertainty. The effect is to harm economic efficiency, including by reducing efficient investment, and ultimately the long-term interests of end-users.

Investors dislike uncertainty. Investors become more hesitant to undertake an investment and require higher compensation for risk as the profitability of the investment becomes more uncertain[8]. As a consequence, it has always been Telstra's view that regulators should avoid actions that create unjustifiable uncertainty.

Restricting the ULLS price to less than the level of cost creates regulatory uncertainty by arbitrarily changing the ground rules set by the ACCC. In particular, the past actions and planned investments of industry players have been predicated on the presumption that the regulatory process was intended to produce access prices that reflect underlying costs measured by TSLRIC+[9]. What Optus proposes is that the TSLRIC+ cost benchmark be

[8] Guthrie, G. (2006). "Regulating Infrastructure: The Impact on Risk and Investment." *Journal of Economic Literature* 44(4): 925-972.

[9] The ACCC defines TSLRIC+ in terms of its component parts: "'Total service" refers to the cost of production of an entire service, not to the cost of a particular unit… "Long run" means that the concept refers to a period where all factors of production can be varied, as opposed to the short run, where the amount of at least one factor of production is fixed. "Incremental cost"… refers to the additional costs of supplying the service over and above the situation where the service was not supplied, assuming the scale of all other production activities remains unchanged. Strictly speaking, the concept refers to only those costs that can be attributed to the production of the service. In practice, the strict TSLRIC concept is often expanded to include a contribution for

abandoned where that benchmark gives an outcome that is sufficiently unfavourable to access seekers, even though it harms full-facility investors. If that were to be accepted, then it would become substantially more difficult for involved parties to forecast the ACCC's actions, creating regulatory uncertainty. Having once abandoned a principled regulatory benchmark to favour a particular set of parties, all market participants would consider the ACCC might behave in a similar manner again.

Such uncertainty would directly reduce investor confidence, and hence efficient investment, to the long-term detriment of end-users, not only in telecommunications markets but also in other markets the ACCC regulates, as firms in other markets would fear the ACCC might also depart from established standards in those markets. It would also harm economic efficiency and the long-term interests of end-users in two further ways:

- Setting prices that do not fully reflect input costs provides poor signals for efficient input use and for full-facility investment. Moreover, such pricing is not competitively neutral, so is unlikely to promote efficient competition (with further negative consequences for economic efficiency).
- Reducing price uncertainty (to access seekers) is better addressed by commercial hedging strategies, rather than regulatory actions, so further undermines economic efficiency.

The three sections that follow respectively discuss how abandoning the cost benchmark raises regulatory uncertainty, distorts efficient input use and investment, and leads to inefficient hedging against price uncertainty.

4.1. CONSISTENT PRINCIPLED REGULATORY ACTION REDUCES UNCERTAINTY AND ENCOURAGES INVESTMENT

Arbitrary changes of regulatory approach create greater uncertainty than consistent principle-based regulatory action, and hence harm investment incentives. The consistent application of a principle (whether it is that of cost-based pricing or something else) allows observers some capacity to predict regulatory outcomes. If the ACCC were to switch its regulatory position explicitly to avoid changes that reliance on its regulatory position would predict then this increases uncertainty. Further, use of a cost benchmark can, when properly applied, anchor the approach to reality. While pricing based on forward-looking TSLRIC involves substantial regulatory discretion, there should be empirical constraints on plausible cost-ranges, and these provide some degree of certainty, transparency and replicability around regulatory decision-making.

The consequence of abandoning a commitment to cost-based pricing, in favour of some less specific interpretation of the long-term interests of end-users (if such a claim could be sustained), would be greater uncertainty. This would result in weaker incentives to invest in facilities, not merely by Telstra, but also by any of Telstra's rivals that were considering or were actually deploying full-facility networks. The abandonment of a commitment to TSLRIC-based prices in favour of even lower prices would remove any assurance that investors might have as to their prospects for cost recovery. Thus, neither Telstra nor its rivals could be sure that facility-based investment would ever be profitable. Moreover, even access seekers,

indirect and overhead costs (TSLRIC+)'. Refer to ACCC, *Unconditioned Local Loop Service (ULLS): Final Pricing Principles*, November 2007, pp7-8

would, looking forward, face greater regulatory uncertainty, because they cannot be sure whether, how and in whose favour, the ACCC might violate its pricing principle again.

4.2. SETTING PRICES THAT DO NOT REFLECT INPUT COSTS IS NEITHER EFFICIENT NOR COMPETITIVELY NEUTRAL

Both economic efficiency and competitive neutrality generally require that ULLS prices reflect the underlying prices of the inputs used to supply ULLS, including transformation costs. This is necessary to ensure efficient signals are provided to access seekers and full-facility investors in their choice between ULLS and full-facility investment, and to prevent competition between access seekers and full-facility investors from being distorted. It is also necessary to ensure that inputs such as copper and labour are purchased for their most valuable uses, whether in telecommunications or somewhere else in the broader economy, and so that competition between sectors is not distorted.

There is, additionally, the issue of the allocation of the costs of uncertainty as between agents. Optus seems to propose that the costs of that uncertainty be borne by Telstra, by proposing that the ACCC set the ULLS price below the level that reflects the cost standard the ACCC itself has long advocated. This would amount to forcing Telstra to bear the costs of regulatory error (or in this case, of a failure to correct regulatory error).

Such an allocation is inefficient, not least because Telstra is obliged to provide the regulated service. It has, in other words, no option but to supply it and to supply it at the regulated price, and hence cannot effectively hedge its position. In contrast, access seekers are under no obligation to purchase the service or to purchase it at a particular price. This makes them better placed to hedge the risks associated with uncertainty in the level of the regulated ULLS price[10]. As a result, allocating that risk to Telstra would be both inefficient – and hence directly contrary to the long-term interests of end-users – and inconsistent with Telstra's legitimate interests (which include an interest in consistent cost-based pricing of the services it is required to supply).

4.3. REDUCING INPUT PRICE UNCERTAINTY IS AN ESSENTIAL COMMERCIAL - NOT REGULATORY - SKILL

The ACCC has no capacity to influence input prices for ULLS services, so it cannot prevent variation in cost-based ULLS prices. Similarly, its ability to provide efficient insurance against price changes is likely quite limited. Rather, this is best left to the firms in question to choose (as all firms must) how best to hedge against price uncertainty.

As previously discussed in section 2.1.1 above, input price uncertainty is ubiquitous. Consequently, to be successful, firms must be able to identify the most efficient means available to them for dealing with price fluctuations. In contrast, the ACCC cannot hope to understand the specific situation of an individual firm as well as that firm does, nor does it face the same incentives to get solutions to the firm's needs as that firm does, and finally, it cannot tailor specific policies that are suited to all the firms, which typically have competing interests. In sum, it is entirely improbable that the ACCC can provide, relative to self-provision, efficient hedging for the industry or even just for access seekers.

[10] As noted, Optus could reduce its risks by investing in its own infrastructure ,or by seeking to negotiate long-term contracts.

Putting aside, the ACCC's inability to provide an efficient hedging service, there are additional negative efficiency consequences of it attempting to do so. This is no less the case when what is involved is correcting past regulatory mistakes, especially as firms themselves should be well placed to know such mistakes have occurred and to be prudent in the extent of their reliance on them persisting. Taking on such a hedging role would discourage those firms the ACCC sought to protect (for example, in this case access seekers) from themselves undertaking commercially routine and efficient hedging against adverse input price movements. Instead, the parties would to some extent rely on ACCC intervention, most especially knowing that lobbying for ex post intervention might be effective. This would further increase overall regulatory risk at least for parties who might be expected to be harmed rather than protected by such interventions. Worse, it would encourage more general rent-seeking, since if the ACCC can be coopted to provide, for example, access seekers, with hedging, it may also be that the ACCC could be further pressed to provide access seekers with other protections and benefits that are also inefficient.

5. GOAL IS EFFICIENT INVESTMENT LEVELS

Optus' concern that "the proposed substantial, rapid increase in the ULLS charge would… significantly discourage investment" fails to recognise that some investment may be inefficient, and hence not in the long-term interests of end-users[11]. If the costs of ULLS are higher than signalled by existing regulated prices, then it is possible that access seekers have overinvested (and/or will overinvest) in the service and the service has been (and/or will be) over-used. Thus, the relevant question is not whether holding the ULLS price below its cost would increase investment (and, as discussed above, this is not obviously the case), but whether a below cost price would encourage efficient investment (which, again as discussed above, is almost certainly not the case).

Put somewhat more bluntly, maximising telecommunications investments generally, or access seeker investment specifically, is not in the long-term interests of end-users. Ultimately, investment is merely a cost like any other, and encouraging firms to incur costs for their own sake would not be reasonable. Indeed, if access seeker investment was all that was important, as Optus seems to suggest, then (assuming there is a simple relationship, of the kind Optus seems to posit, between access charges and access seeker investment levels) a zero or negative access price should be imposed. No doubt, Optus is not proposing this, but neither does it provide any sense that its call for promoting investment must be guided by some constraining principles.

In this light, it is ironic that Optus has relied on analysis of what became known as the CLEC[12] meltdown in the US as evidence of efficient investment.[13] For example, CLECs are

[11] Optus appears to recognise this when starts its conclusion, "Optus submits that effective access regulation does not discourage efficient investment in infrastructure" but then seems to discard the point by finishing, "and Telstra's proposed ULLS undertaking will not encourage such investment." The difficulty is that Optus at no point discusses how setting the ULLS price below its costs could encourage efficient investment.

[12] CLEC stands for competitive local exchange carrier.

[13] In this respect, the Optus Supplementary Submission, *ibid*, p3 lists the following papers: K A. Hassett and L. J. Kotlikoff, *The Role of Competition in Stimulating Telecom Investment*, AEI PUBLICATION (October 2, 2002); Ford and Spiwak, *The positive effects of unbundling on broadband deployment*, Phoenix Center Policy Paper No. 19, September 2004; R. D. Willig, W. H. Lehr, J. P. Bigelow, and S. B. Levinson, *Stimulating Investment and the Telecommunications Act of 1996*, Unpublished Manuscript (October 2002); G. S. Ford and M. D. Pelcovits, *Unbundling and Facilities-Based Entry by CLECs: Two Empirical Tests* (July 2002); T. R. Beard, R. B. Ekelund Jr., and G.S. Ford, *Pursuing Competition in Local Telephony: The Law and Economics of Unbundling and*

reported to have spent US$65 billion on capital expenditure over the five years ending in 2001, yet at that point their market capitalisation amounted to US$4 billion, suggesting 94 percent of the capital invested was wasteful[14].

Optus also fails to note substantial differences, and does not describe subsequent developments, in the US market, all of which place its conclusions in some doubt. The US Federal Communications Commission (FCC) does not regulate shared access, applies a retail minus approach to setting resale prices, and requires that prices for the US equivalent to ULLS, called UNE-L, be set to cover their total element long run incremental cost (TELRIC, the equivalent of TSLRIC in Australia). By the late 1990s, UNE-L was widely available and this remains the case. Several years later, in 2003, the FCC announced it would not regulate fibre-to-the-home (FTTH) next generation access networks (NGANs) (beyond requiring lease of a 64 Kb/s, that is, voice-grade loop), and in 2004, extended this to cover fibre-to-the-node (FTTN) NGANs[15]. The FCC found this was in part "necessary to ensure that regulatory disincentives for broadband deployment are removed"[16], a position that is consistent with Ofcom's recent decisions to reduce regulatory requirements for subloop unbundling on FTTN networks and to provide clearer regulatory guidance on how it would regulate FTTH networks[17].

In apparent response, and consistent with the FCC's view, midway through 2004, Verizon announced a FTTH overbuild network[18] so as to compete with the voice, broadband and subscription television offerings (the so-called 'triple-play') of its cable rivals. Again consistent with the FCC's views, even critics considered that the key factor that may have made FTTH viable was that it would not be subject to access regulation[19]. In January of 2005, AT&T announced an FTTN rollout[20].

By January, 2009:

Impairment (November 2002); T. R. Beard, G. S. Ford, and T.M. Koutsky, *Mandated Access and the Make-or-Buy Decision: The Case of Local Telecommunications Competition* (December 2002)

14 Darby, L. F., J. A. Eisenach, et al. (2002). "The CLEC experiment: Anatomy of a meltdown." Progress on Point: Periodic Commentaries on Policy Debate, http://www.pff.org/publications/communications/pop9.23clecexperiment.pdf, page 14.

15 See FCC, In the matter of review of the section 251 unbundling obligations of incumbent local exchange carriers […], FCC 04-248, 18 October 2004; paragraph 1-2.

16 *Ibid*, paragraph 9; see also (2004). United States Telecom Association v. FCC 359 F.3d, US Court of Appeals for the District of Columbia: "any damage to broadband competition from denying unbundled access to the broadband capacities of hybrid loops is likely to be mitigated by the availability of loop alternatives or intermodal competition" (at page 582) and is "likely to delay infrastructure investment, with CLECs tempted to wait for ILECs to deploy FTTH and ILECs fearful that CLEC access would undermine the investments' potential return" (page 584).

17 On FTTN, see Proposed variation to BT's Undertakings under the Enterprise Act 2002 related to Fibre-to-the-Cabinet, 3 March 2009. On FTTH, see Ofcom "Next Generation New Build", 23 September 2008; and Ofcom "Delivering super-fast broadband in the UK: Setting the right policy framework, 23 September 2008.

18 Press release, Customers Over Its Fiber-to-the-Premises Network, 19 July 2004, http://investor.verizon.com/news/view.aspx?NewsID=532. In the preceding months there had been earlier announcements of initial FTTP deployment in Keller, TX.

19 Weinschenk, Carl, "Verizon's Clever Corridor Play", IT Business Edge, 20 March 2006, http://www.itbusinessedge.com/item/?ci=13778&nr=1.

20 Press release, SBC Communications Unveils U-Verse(sm) Experience At International Consumer Electronics Show, 6 January 2005, http://www.att.com/gen/press-room?pid=4800&cdvn=news&newsarticleid=21541.

- Verizon's network passed 12.7 million homes (about 40 percent of Verizon's territory). Verizon could provide the triple-play to over 9 million homes, and had nearly 2.5 million FiOS broadband subscribers, with 1.9 million subscription television services[21];
- AT&T's FTTN network had passed 17 million homes, with more than a million subscriptions of the 9.3 million homes it was marketing to[22].
- It was estimated that Comcast, the largest cable company in the US, faced overbuild competition in 20-21 percent of its area, and that, despite the recession, this might grow to 30 percent before the end of the year[23]. In response, new Comcast investment appears set to bring DOCSIS 3.0 to 65 percent of its footprint by the year's end[24].

In summary, regulation imposed TELRIC priced UNE-L shortly after the passage of the Telecommunications Act of 1996. Yet, it took approximately seven years from that point for ILECs to start to undertake substantial network modernisation. Moreover, Verizon (with respect to FTTH) and AT&T (with respect to FTTN) began making their respective investments almost immediately after the FCC respectively announced it would not force access to FTTH and then FTTN networks. Consequently, it is unlikely that UNE-L drove this change. Rather, the trigger seems to have been the FCC's decision not to force access to NGANs.

6. 'COMPETITIVE STIMULUS HYPOTHESIS' BASED ON COST-BASED PRICING

Optus cites some US case studies of the competitive stimulus hypothesis, but fails to note that all of these studies are predicated on the stimulus arising in the context of cost based pricing of the type that underpins Telstra's access undertaking. The studies cited do not provide support for the proposition that the effects of the competitive stimulus hypothesis outweigh clearly detrimental impacts on investment incentives and competition that would arise from access prices being set below cost.

The assumption of cost based pricing is an essential feature of the studies cited by Optus. For example, Willig (2003) defines the Competitive Stimulus Hypothesis as asserting that:

> *"the availability of UNEs [unbundled network elements] at TELRIC [total element long-run incremental cost] based prices is necessary for competition. It is this competition that enables them [competitive local exchange carriers, CLECs] to invest, and that motivates the ILECS [incumbent local exchange carriers to increase their investment in network facilities]."* (emphasis added)

In other words, the competitive stimulus hypothesis as defined by Willig does not assert that competition at any price will encourage investment. It explicitly assumes that prices must be

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21 Press release, Verizon Reports Sustained Revenue Growth and Continued Strong Cash Flows for 4Q and Full-Year 2008, 27 January 2009, http://investor.verizon.com/news/view.aspx?NewsID=961.

22 Stump, Mat "AT&T Q4 '08: U-verse TV up 264K, 1M in phone losses", 28 January 2009, http://www.onetrak.com/ShowArticle.aspx?ID=3879.

23 Spangler, Todd "Comcast: 50% 'All-Digital' in 2009", 5 March 2009, http://www.multichannel.com/blog/BIT_RATE/11472-Comcast_50_All_Digital_in_2009.php.

24 *id.*

based on TELRIC costs, and Willig's paper refers repeatedly to the availability of UNEs at TELRIC-based prices.

Willig goes on to analyse the investment incentives for ILECs and CLECs under UNE availability with cost based pricing. He notes that under either monopoly or competition, firms will have an incentive to invest as long as incremental revenues from such investments exceed their costs:

> *"Like any rational firm, the firm's investment will be governed by the perspective that the firm will install further units of capital so long as the incremental expected revenues from these units exceed the costs (inclusive of risks) of acquiring them."*

If prices are set below cost, it is difficult to see how an ILEC's incremental expected revenues from investment could exceed costs under any market structure, let alone under competitive conditions.

The assumption that prices must be based on costs for the competitive stimulus hypothesis to hold is also explicitly recognised in other papers cited by Optus. For example, footnote 13 of Ford and Spiwak's (2004) empirical study notes that prices must be TELRIC-based.[25] In fact, in footnote 14 Ford and Spiwak note the critical part played by costs:

> *"One of the major arguments supporting the movement to remove these access and pricing decisions from state commissions is that there are allegedly high differences in the prices for that access. This argument does not withstand scrutiny, however, because it has been statistically proven that that [sic] differences in UNE-P prices both across States and within States are due to genuine cost differences and differences in TELRIC and are not because of regulatory failure by the States." (emphasis added)*

Similarly, Hassett and Kotlikoff, who Optus also cite, do not suggest that access prices should be set below cost to encourage efficient investment. Using the standard textbook model of static monopoly pricing under conditions of falling average costs, Hassett and Kotlikoff argue that from an efficiency point of view, average cost pricing will be too high, but also note that marginal cost pricing will not be incentive compatible unless the monopolist is provided with a fixed payment to compensate for its losses. However, their discussion recognises that cost-based pricing of some form should be implemented, not that below cost prices are necessary or could be used to encourage efficient investment.

7. MIXED FINDINGS ON THE EFFECT OF COST-BASED PRICING

Finally, it is far from clear that the availability of ULLS at prices intended to recover long run incremental costs is key to driving efficient facility investment decisions (as US courts, the FCC and Ofcom have recognised).[26] The difficulty is that while ULLS prices based on long run incremental cost, relative to prices that take a broader approach to costs, encourage

[25] Ford G.S. and L.J. Spiwak, 'The Positive Effects of Unbundling on Broadband Deployment', Phoenix Center Policy Paper No. 19, September 2004.

[26] See footnotes 16 and 17 above.

access seekers, and hence increase competition, they discourage full-facility investment, and it is generally accepted that full-facility competition is superior to access seeker competition.[27]

Indeed, on the question of investment incentives, the bulk of the published economics literature (in contrast to the unpublished advocacy pieces from five or more years ago that Optus cites) either concludes against the Optus claim[28], or concludes that the evidence is mixed. This is despite the fact that the studies cited by Optus assume access prices that are intended to recover *at least* long run incremental costs. In fact, we have not seen any literature that advocates below cost pricing as a means of promoting efficient investment.

In a recent survey of the literature in one of the profession's leading academic journals, Guthrie (2006) concludes that:

> *"Almost ten years have passed since the Telecommunications Act transformed telecommunications regulation in the United States and economists still do not have a thorough understanding (theoretically or empirically) of how local loop unbundling affects investment. Understanding of the investment response to electricity transmission pricing is even less developed. More study of access regulation and its impact on investment behaviour, especially investment timing, is needed."*

There are many good reasons for this lack of thorough understanding of the effects or regulation on investment.

As a general proposition investment returns are subject to uncertainty, and the situation is no different in telecommunications. Regulation – even cost based price regulation – alters the allocation of risk between firms, shareholders and consumers and the simple act of reallocating risk can deter investment. Simple static models of monopoly pricing under conditions of certainty ignore this reality.

Second, regulation may suffer from credibility or time consistency problems. Once an investment has been undertaken, the regulator may have an incentive to engage in opportunistic regulatory behaviour to take advantage of the fact that the investment may be partially or fully irreversible.

This is the classic "capital-levy" problem that Fischer (1980) first identified[29]. The point is not that the regulator will engage in opportunistic behaviour, or that this has occurred in the past.

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[27] The ACCC has noted this on a number of occasions, including in its 2007 review of fixed network regulation (ACCC, *Fixed services review – second position paper*, April 2007, p. 41). It has also been acknowledged by the ACT (*Re Application by Chime Communications Pty Ltd* [2008] ACompT 4 (22 December 2008) and overseas regulators such as Ofcom (Ofcom, *Strategic Review of Telecommunications: Phase 1 Consultation Document*, April 2004, pp17-18) and the FCC (*Triennial Review Order*, 18 FCC Rcd 16978, paragraph 70). Two recent academic papers that have not yet been published in peer-reviewed journals are also instructive. The first finds that while ULLS competition does increase broadband penetration, the larger long-term effects come from full-facility competition (H. Gruber and M. Denni (2005) The Diffusion of Broadband Telecommunications: The Role of Competition, http://ssrn.com/abstract=829504), while the second finds "that while inter-platform competition drives broadband adoption, competition in the market for DSL services does not play a significant role" (Distaso, W. and P. Lupi (2004). "Platform Competition and Broadband Adoption in Europe: Theory and Empirical Evidence from the European Union", http://129.3.20.41/eps/io/papers/0403/0403005.pdf).

[28] For example, as is the case for most of literature surveyed in Baranes, E. and M. Bourreau (2005). "An Economist's Guide to Local Loop Unbundling." *Communications and Strategies* 57: 13-31; papers not cited that find ULLS harms investment include: Hausman, J. A. and G. J. Sidak (2005). "Did Mandatory Unbundling Achieve its Purpose? Empirical Evidence from Five Countries." *Journal of Competition Law and Economics* 1(1): 173-245.

[29] Fischer S (1980), 'Dynamic inconsistency, cooperation and the benevolent dissembling government', *Journal of Economic Dynamics and Control*, 2(1): 93-107

They key issue is that unless the regulator can credibly commit, industry participants believe that there is some chance (no matter how small) that this kind of behaviour may occur in the future.

One solution to this problem is for the regulator to employ a costly commitment device; another is to establish a reputation for not engaging in opportunistic behaviour over time. The inability of the regulator to commit to a regulatory rule or to quickly build up reputational capital, however, means that no or little investment may take place to begin with.

Third, there is the structure of industry competition. If new entrants can profitably pre-empt an incumbent's investments then they may have an incentive to speed up investment. But if they do not have such a first-mover advantage then the opposite set of incentives apply. Even under competitive conditions and cost-based pricing, it is unclear which set of incentives applies and whether those same set of incentives will always apply over time. There is no hard and fast rule that says that one set of players always has an incentive to pre-empt the other.

Fourth, there is a body of literature that suggests regulatory pricing of ULLS, by failing to take account of the option value access seekers gain by not having to sink investments, can discourage efficient investment in full-facilities[30]. Many telecommunications investments are irreversible and cannot be resold for price paid or are industry-specific. Even if investment returns were not uncertain, pricing rules that do not reflect sunk costs may deter future investments. The reason is simple: under long run incremental cost pricing any future sunk costs may not be recovered. This creates a disincentive to make the sunk cost investment in the first place. Any pricing rule – even one based on some form of costs – that ignores the true economic nature and characteristics of future sunk costs will be likely to distort investment incentives.

Obviously, a failure by a regulator to set prices to costs, or to consistently apply a cost benchmark, adds to the perceived risk of time inconsistency and hence is more likely to harm than to promote efficient investment.

In summary, whether making ULLS available at long run incremental cost prices boosts investment is far from being a settled issue and, if anything, the literature expresses some concern that long run incremental cost pricing may provide inefficiently low investment incentives. Moreover, it is a common finding in published literature that below cost pricing will discourage efficient investment by facility providers and promote inefficient investment by those who make use of below cost access to those facilities.

[30] For a cogent statement of the problem see Pindyck, R. S. (2007). "Mandatory Unbundling and Irreversible Investment in Telecom Networks." *Review of Network Economics* 6(3): 274-298; For a survey of the literature see Alleman, J. H., G. Madden, et al. (2008). "Real Options Methodology Applied to the ICT Sector: A Survey." *Communications and Strategies* 70: 27-44; see especially pages 31-33. For a modern empirical demonstration of such regulatory mis-pricing see Benzoni, L., N. Gresser, et al. (2008). "Invest Today or… Tomorrow? A Real Option Approach to Strategic Development in the French DSL Market." *Communications and Strategies* 70: 89-99.