

Telecommunications Access Pricing: The Australian Experience

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TABLE OF CONTENTS

1.	BACKGROUND	1
1.1.	FORWARD LOOKING COSTING	3
1.2.	THE CONSISTENCY TEST	7
1.3.	ADDING UP AND FULL COST RECOVERY	8
1.4.	RELATIVE PRICE DISTORTIONS	11
1.4.1.	Local calls	12
1.4.2.	Access services.....	13
1.5.	TIME INCONSISTENCY	15
1.5.1.	Provisioning.....	16
1.5.2.	Depreciation and the capital charge	19
1.6.	AGGRAVATED BY PRICE CHANGES	23
1.7.	CONCLUSIONS	24
2.	REFERENCES.....	26

TABLE OF FIGURES

Figure 1: ACCC Decisions on Monthly Band 2 ULLS Charges, 2002 to 2007	22
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TABLE OF TABLES

Table 1: ACCC local call estimates and under-recovery of costs	10
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Third party access regimes impose on an incumbent an obligation to provide third parties with access to designated services and facilities at regulated terms and conditions. This article examines the manner in which the ACCC has set the terms and conditions of third party access in telecommunications. It finds that prices have been set below costs and more generally in ways that are likely to discourage efficient use and investment.

1. BACKGROUND

Third party access rights are provided for in Australia under both economy-wide instruments and through legislation specific to particular industries. The economy-wide regime is set out in Part IIIA of the Trade Practices Act, which was enacted in 1995 subsequent to the Independent Committee of Inquiry into Competition Policy in Australia (1993) (the “Hilmer Report”). A separate access regime for telecommunications is set out in Part XIC of the Trade Practices Act, which came into effect in July 1997. There are also specific access regimes for natural gas and for electricity. However, unlike the telecommunications regime, these broadly operate within the Part IIIA framework.

While there are significant differences between these access regimes, there are some broad, “architectural”, similarities. In Australian access regimes, the precise scope of mandated third party access is typically determined not by statute but by an essentially administrative process which includes or excludes individual services from a requirement to provide access. What is determined by statute are the mechanisms involved in that process as well as the broad criteria that process must consider, so that it is through these (as well as through the attitude adopted by the administrative decision-makers) that the degree to which the regime is ‘conservative’ (i.e. restrictive) in granting access is determined.

In Part IIIA and in Part XIC, services covered by the regime are said to be “declared”. However, the criteria and relevant process for declaration differ and there are more stringent checks and balances against declaration in the former regime than in the latter.¹

The main result of these differences is that far more services have been declared under Part XIC than under Part IIIA. Moreover, Part XIC declarations have involved a number of services that are close substitutes and some that are simply intended for resale. Both of these outcomes would not be possible under Part IIIA. Finally, very few services have had declaration revoked or subsequently limited under Part XIC.

¹ Thus, in Part IIIA, the criteria for declaration involve a list of hurdles, each of which must be met, while Part XIC simply involves a number of loosely-specified criteria which can be traded off. Additionally declaration decisions under Part IIIA are made on the recommendation of the National Competition Council, which plays no part in regulating declared services. Those decisions are then subject to review by a Minister and, if appealed, by the Australian Competition Tribunal (“ACT”). In contrast, under Part XIC, declaration decisions are made by the Australian Competition and Consumer Commission (“ACCC”), which then regulates access to the service. In that sense, the regulator is in a position to expand the scope of its own control. Moreover, those decisions are not subject to review on the merits.

Once a service is declared, the ACCC can, in the event of dispute between an access seeker and an access provider, use powers of mandatory arbitration to determine the terms and conditions of access to that service. Under both Part IIIA and Part XIC, an access provider has the scope to submit an Undertaking setting out the terms and conditions on which it will provide a service. If the Undertaking is accepted, the ACCC must arbitrate an access dispute in a manner consistent with that Undertaking. The Undertaking, in other words, provides access providers and access seekers with a degree of certainty as to the terms and conditions of access.

In practice, the Undertaking mechanism under Part XIC has not been effective, in the sense that Undertakings are rarely accepted for key services. To date, only two Undertakings offered by Telstra have been accepted, one that merely copied the indicative prices issued by the ACCC immediately prior to the Undertaking being lodged, while another had very short duration (and was accepted on the basis of that fact).² All the other Undertakings offered by Telstra have been rejected, as have the Undertakings offered by SingTel Optus and by Vodafone. There is a right to appeal to the ACT for review on the merits of decisions in respect of Undertakings. All such appeals by Telstra, Optus and Vodafone have failed.

When an Undertaking is not in place, the ACCC must arbitrate disputes taking account of a list of considerations set out in the legislation. Here too, Part IIIA and Part XIC differ. These differences go both to the substance of the factors the ACCC must take into account and to the relevant process.

With respect to the factors, Part IIIA was initially relatively non-prescriptive regarding the determination of the terms and conditions of access to services brought within the scope of the access regime – indeed, its broad structure was similar to that of Part XIC.

Thus, many of the provisions which the ACCC was initially required to take into account under Part IIIA were very general in character and hence capable of wide interpretation, much like the analogous provisions in Part XIC. Under s44X³, the ‘legitimate business interests’ of the service provider must be considered, as well as the interests of those with a right to use to service. The section also requires some assessment of the competitive benefit of access, such that the ACCC must consider the ‘public interest in having competition in markets’. Consideration must also be given to ‘the direct costs of access’. These considerations are substantially similar to the “laundry list” of factors set out, for the determination of access disputes, in s152CR of Part XIC.

Additionally, the legislation did not assign weights to the criteria in the section; it simply obliged the ACCC to have regard to each and every factor. As a result, the ACCC could

² Telstra’s 2003 Public Switched Telephone Network Originating and Terminating Access (PSTN OTA) undertaking was accepted primarily because “Telstra’s proposed disaggregated PSTN O/T rates result in headline rates only marginally above Commission’s model price terms”. See ACCC (2004a, p. 2). Telstra’s 2003 LCS undertaking was accepted, inter alia, “given... the fact that the LCS undertakings will only apply for six months”. See ACCC (2004a, p. 2).

³ The section of Part IIIA which defines the relevant criteria but to which other sections, discussed below, have now been added.

simply trade one factor off against another, thereby determining disputes much as it thought fit.

This situation has changed as significant modifications have been made to Part IIIA and specifically, to s44X (changes which have *not* been replicated in Part XIC). The most important change is the insertion of 'pricing principles' which the ACCC *must* take into account. These principles require that the regulated price be sufficient to cover the efficient costs of providing access, including a return commensurate with regulatory and commercial risk.⁴ In contrast, under Part XIC, there is no explicit requirement for access prices to cover costs.

Regarding the process by which access charges are set when an access Undertaking is not in place, the most significant difference is that Part XIC does not provide for a right of review on the merits of ACCC arbitration decisions, while Part IIIA does. Effectively, if an Undertaking is not in place, there are few constraints on the manner in which the ACCC can set access charges under Part XIC.

In short, the telecommunications access regime provides the ACCC with very wide discretion regarding both the range of access services it mandates and the manner in which it sets access charges for those services.

1.1. FORWARD LOOKING COSTING

Ultimately, every form of access charging involves some consideration of the costs of supply. Regulators face a choice in this respect between alternative cost bases.

Faced with that choice, the ACCC has relied not on historical costs (i.e. the outlays actually incurred in acquiring and operating assets) but rather on current costs. While the term "current cost accounting" covers several differing methodologies,⁵ common to these methodologies is that cost estimates are based on current input prices and technologies (and expectations about future input prices and technologies) rather than on amounts actually outlaid in the past. They are in this sense "forward" rather than "backward" looking.

At a conceptual level, forward-looking approaches can be seen as involving a particular kind of "fair bargain" between the regulated firm and the regulator. In this bargain:

1. The firm agrees to undertake an investment; in exchange for which
2. The regulator agrees to provide the firm with an income in each future period which reflects the current cost of its assets in that period; where, if the participation constraint is to be met,

⁴ Additionally, the pricing principles also allow for multi-part tariffs and price discrimination where such a pricing structure is more efficient. It is important to note that, as well as applying in the arbitration context, the pricing principles also apply to the assessment of undertakings.

⁵ A useful taxonomy can be found in Ma and Mathews (1979, p. 478 and following).

3. The expectation of that current cost income stream is equal, in present value terms, to the cost of the investment.

As a general matter, a “bargain” expressed in these terms means that the firm is more vulnerable to asset stranding than it would be under conventional historical cost accounting. In historical cost accounting, the value of the asset base is determined by the outlays the firm has made; once made, those outlays remain on the asset side of the ledger until they are completely written off. In contrast, in the bargain set out above, the asset base for which the firm ultimately receives payment will be determined by the periodic re-estimations, which creates a risk of the firm securing an actual income which falls below its actual costs.

Were depreciation in each period set on an actuarially fair basis, then – so long as the regulator acts in a manner that is time consistent (i.e. depreciation is paid as and when it falls due) – the firm should recover its costs, at least in an expected value sense. This is simply because actual depreciation in each period must (if the expected amount has been set on an actuarially fair basis) be no less likely to exceed the expected or forecast amount as to fall below it. However, whether the firm can indeed expect to thus be compensated depends on whether the “bargain” that it is being offered is credible, i.e. whether, once the investment is made, the firm can hold the regulator to the terms of the commitment.

One factor this hinges on is whether the “bargain” is based on conditions that are *verifiable*. There are, in this respect, two crucial differences between historical cost accounting on the one hand and forward-looking costing on the other.

First, the historical cost accounts, given their role in statutory financial reporting, are highly standardised. This limits the scope for discretion in their application. Forward-looking accounts do not have the same statutory significance; there are consequently no detailed, widely accepted, standards as to how those accounts should be constructed that can limit the regulator’s discretion in the costing exercise.⁶

Second, the historical cost accounts are *ex post*, relating to transactions that have actually occurred. This makes them capable of independent audit, that audit being based on the primary record of the underlying transactions. In contrast, forward-looking approaches are reliant on estimating prices for transactions that have not occurred (and in many cases could not occur) – such as the hypothetical reconstruction of networks that are in place. They also depend on estimates of future events, for example in determining price trends relevant to the selection of the technology to be used as the basis for the modelling. These estimates may be tested as to their plausibility, but they are plainly not capable of being audited in the conventional sense.

As a result, any system of costing that is primarily forward-looking will create issues of verifiability, which must cast at least some doubt on the viability of the “fair bargain” set out above.

⁶ As discussed below, this is especially so for the approach to forward-looking costing adopted by the ACCC, which makes it all the more incomprehensible that the ACCC should claim that compared to TSLRIC, the historic cost accounts are not “reliable”. See ACCC (2007a) at page 8.

While these difficulties are inherent in forward-looking costing, some approaches to forward-looking costing are more discretionary and uncertain than others.

Thus, as a practical matter, the approaches adopted by regulators to implementing forward-looking costing fall into two broad types.

The first takes a “top down” perspective. It starts from the firm’s management accounts and revises these on a forward-looking perspective. On the asset side, it does this by estimating for each asset class the cost of replacing that asset class’ outstanding service potential, either through a “modern equivalent asset” approach or by the reproduction cost approach, that is, by repeated application of price indices measuring the asset’s reproduction cost.⁷ Adjustments are also made to current (non-capital) outlays so as to put these on a basis that reflects market prices and available technologies. Finally, a reconciliation is effected to the historical cost accounts by creating reserves in the Balance Sheet for supplementary and backlog depreciation and for holding gains and losses.

The second involves a “bottom up” approach, centered on developing and estimating an engineering cost model of a hypothetical, optimised telecommunications network. Although these models usually share some parameters of the existing network (such as the location of key nodes), they essentially involve recreating the network from a blank sheet of paper. The models that do this have two characteristics: they rely on measuring the costs that a hypothetical efficient supplier would incur in the longer term; and they define the relevant costs as those that would be incurred by such a supplier in the provision of a specified increment of output. They thereby combine the optimisation emphasis that characterises the Optimised Deprivation Value (ODV) approach to valuation of the asset base⁸ with the marginal approach, and the resulting emphasis on the relevant output increment, characteristic of economic decision analysis.⁹

TSLRIC (total service long run incremental cost) and TELRIC (total element long run incremental cost) are the main practical forms this approach takes in telecommunications. It is on these methodologies that the ACCC has (with exceptions noted below) relied for determining access charges in telecommunications.

In essence, TSLRIC and TELRIC¹⁰ involve three elements: the relevant increment that is costed is defined as the *total* volume of the service at issue (for instance, the total telephony traffic carried over the network); the decision at issue is taken to be whether the increment is supplied over the longer run – so that the capital stock is fully variable, and

7 Although the reproduction cost approach is less frequently used, it can be shown that the risk of error is smaller in using reproduction accounting in the face of obsolescence relative to conventional Modern Equivalent Asset valuation – see Revsine (1979).

8 See Whittington (1983, pp. 131-136).

9 See, for example, Fabrycky, Thuesen and Verma (1998) and Ergas (1998).

10 The ACCC claims that its approach to forward looking costing in telecommunications involves TSLRIC. Technically, this is not correct, as it is really a variant of TELRIC. However, I will follow the ACCC in referring to it as TSLRIC.

hence is included in the cost pool; and the concern is with the resources that would be needed to provide this service with current technology and management practices, as against those that may have been inherited from earlier periods.

In theory, the top down and bottom up approaches should be equivalent – indeed, if a “bottom up” costing is properly constructed, it should be capable of being reconciled with the “top down” accounts and hence ultimately traced back to the historical cost accounts. In practice, however, such reconciliation is never complete, so that the two approaches can (and usually do) yield quite different estimates.

Of these estimates, those based on “top down” approaches are more readily verified than are those based on “bottom up” models. This is for two reasons.

First, “top down” methodologies have at least some role in conventional accounting. Indeed, there have been periods during which the restatement of statutory financial accounts on to a “current cost” basis was mandatory, so that some (admittedly patchy) accounting conventions have been established about how that restatement is to be made. Moreover, “top down” approaches are widely used in EU regulation (including of telecommunications), encouraging standardised methodologies to be developed. In contrast, “bottom up” models tend to be bespoke and have little by way of detailed standardization from model to model.

Second, because it is “keyed off” the regulated firm’s own accounting records, the “top down” approach is necessarily capable of being connected back to what the firm actually does and the investments that have actually been made in the firm over time. However, no such linkage exists for “bottom up” costing.

This means that “bottom up” approaches have less of an anchor to the regulated firm’s operational environment; rather, they are inherently hypothetical exercises that involve constructing hypothetical networks in situations that are unlike those ever experienced. For example, no actual telecommunications network is ever built from scratch essentially over-night; rather, networks evolve over time, with that sequential development having an important influence on how they are designed, built and operated. In contrast, TSLRIC-type models usually assume immediate construction from a clean slate.

The hypothetical, difficult to verify, nature of the resulting “bottom up” estimates exposes the firm to added regulatory risk, as the regulator’s discretion with respect to costs increases the scope for regulatory opportunism. Adding to the risk that creates is the risk of error in the calculation of the various elements involved in a TSLRIC model.

This risk of error reflects the sheer number of interacting assumptions on which any such hypothetical cost model must rely.¹¹ As errors can be made in each of these, the firm may be exposed to having its income reduced (so as to reflect “optimisation” by the regulator of its costs) by an amount that is only an approximation – and may be a very poor approximation – of the *actual* gap between its costs and the costs that would be incurred by an efficient firm.

11 These various elements are listed in Ergas (1998).

Combined, periodic re-optimisation, limited verifiability and measurement complexity (and associated measurement error) inevitably expose the regulated firm to greater income risk than it would bear under a less discretionary approach to cost estimation. The access provider may experience:

- Asset stranding from “*actual*” gaps between the *expected* optimized asset value in each period (that expected value being the basis for the depreciation charge) and the *properly measured* optimized asset value in that period;
- Asset stranding from *measurement error* – that is, from incorrect estimation of the difference between the expected optimized asset value in a period and the actual asset value in that period; and
- Asset stranding from *regulatory opportunism* – that is, from the regulator using the discretion inherent in limited verifiability to reduce the firm’s income stream by arbitrarily writing off some part of its assets; as well as
- *Interactions* between all of these.

Moreover, the nature of the “bottom up” methodology limits the firm’s ability to differentiate between these, much less demonstrate to third parties the extent and sources of the unjustified losses that have been inflicted upon it.

1.2. THE CONSISTENCY TEST

It is against the backdrop of this income risk that the ACCC’s determination of telecommunications access charges will be examined. The key criterion used in this assessment is that of *consistency*.

The thought experiment underlying TSLRIC is that the regulator commits to paying the access provider an amount that corresponds to the current cost of building and operating a new, fully efficient, wholesale-only network capable of providing the access service. As that network provides a range of services, the regulatory promise has both a within-period and a between-period dimension.

The within-period dimension refers to the multi-service adding-up constraint. The sum of the regulated access charges across the range of services provided by the network must be no less than the amount which would cover the costs of the network.

The between-period dimension refers to the need for the expected path of access charges over time to be no less, in present value terms, than the initial cost. Clearly, were this condition not expected to be met, no investor would enter voluntarily into the “regulatory bargain”. This is no different from the familiar concept of time-consistency in economic policy.¹²

¹² Time-inconsistency arises when a policy that is optimal (from the point of view of the regulator) *ex ante* turns out not to be the optimal policy *ex post*. If the policymaker cannot commit to a policy, it may then find itself wanting to change its policy *ex post* (say, after a firm has made its investment decision), regardless of what it said *ex ante*. Such an approach to policy is said to be time-inconsistent. Kyland, F. and E. Prescott (1977)

In examining the pattern of ACCC access charging, it will be shown that:

1. Access charges have been set in a way that does not respect “adding up” constraints, and notably the requirement for full cost recovery (section 1.3);
2. The resulting shortfalls have been increased by distortions in relative prices between substitutable services (section 1.4);
3. The failure to allow recovery of even “efficient” costs has been aggravated by decisions by the ACCC that plainly involve “time inconsistency” (section 1.5); and
4. The distortions associated with thus setting the *level* of access charges incorrectly have been accentuated by very steep rates of *decline* in access charges that far exceed any reasonable estimate of the rate of reduction in costs (section 1.6).

1.3. ADDING UP AND FULL COST RECOVERY

Telecommunications networks are characterised by extensive economies of scope (that is, cost savings that result from providing many different services jointly). Those economies arise from the fact that many services are provided over a common set of assets, most notably the links that run from customers’ premises to points of traffic aggregation (such as routers, multiplexers and switching systems) and shared traffic management facilities (including switching and network management systems). Reflecting those economies, the incremental costs of any particular service tend to be low relative to average costs (that is, the unit cost of all traffic considered jointly¹³). Were access charges set only on the basis of incremental costs, total costs would never be recovered.¹⁴

Forward-looking costing systems deal with this through cost allocation rules that attribute to each service responsibility for recovering some share of joint and common costs. Those rules work on the basis of “cost drivers”, which (at the network level) involve the attribution of the costs of individual network elements to services on the basis of each service’s share of each network element’s use. A key feature of these rules is that the resulting allocations “add up”. A failure to “add up” obviously implies a shortfall between total costs and the revenues that would be generated were each service sold at a price that reflected its allocated cost responsibility.

That the ACCC’s price setting has resulted in such failures is readily illustrated using the Local Call Service (LCS). That service is a “resale” version¹⁵ of a retail service – local calling – that is directly price capped. Specifically, under the price capping arrangements,

13 Strictly speaking, average costs are not generally uniquely defined for a multi-product technology. Here, the term is used to refer to the unit cost estimate generated by the unique cost allocations of a particular TSLRIC model.

14 The importance of recovering common costs is recognised by the ACCC in ACCC (1997), see p. 39 and 41 and footnote 41 at p. 39.

15 That is, the declared service is no more than a “wholesale” version of the retail product, where the end-to-end service is provided by Telstra but the access seeker is responsible for marketing and billing.

the retail price for an un-timed local call is capped at 22 cents, excluding Goods and Services Tax (GST), with such an un-timed service to be available nationally at an essentially uniform price.¹⁶

The capped retail price for un-timed local calls has generally been regarded both by Telstra and by the ACCC as being below the average cost of a local call, where that average cost is determined by attributing to local calls some responsibility for the joint and common costs of the network. Given that, the ACCC has had two options:

- It could set wholesale (i.e. access) charges on the basis of costs, so that the wholesale charge might exceed the capped retail price; or alternatively,
- It could set the wholesale charges on the basis of the capped retail price. To the extent to which this would result in those charges being below a relevant benchmark of costs, the issue of where the cost shortfall would be recovered would need to be addressed.

Some regulators, faced with this choice, have chosen the former approach – on the basis that this places access seekers in a position that is competitively neutral with the access provider, as both incur a cost shortfall in supplying the price capped services.¹⁷ The ACCC, however, has opted for the latter, which it has implemented by setting the wholesale price on the basis of subtracting from the capped retail price the cost of those activities that a wholesale-only provider would avoid (a price determination methodology generally referred to as “retail minus”).¹⁸ As a result, to the extent to which there is a shortfall between the capped price and costs, that shortfall will remain and need to be recovered elsewhere.

¹⁶ *Telstra Carrier Charges — Price Control Arrangements, Notification and Disallowance*, Determination No. 1 of 2005, later amended by *Telstra Carrier Charges — Price Control Arrangements, Notification and Disallowance*, Determination No. 1 of 2005 (Amendment No 1 of 2006), Clause 16 “Untimed local calls”. The effect of the requirements set out in the price determination in ensuring that call charges for an untimed local call are the same in all areas is discussed in ACCC (2005a, p. 111 and follows).

¹⁷ This approach was adopted by the UK regulator OFTEL when setting wholesale local charges at the time when prices for retail local calls in the UK were still capped. It might be thought that adopting this approach would simply lead access seekers to not provide the services that would need to be offered at a loss. However, the rationale for requiring that these services be available at wholesale was that consumers placed a significant premium on being able to obtain the bundle of services, including the price-capped services, from a single supplier. As a result, competitive pressures would induce access seekers to provide those services and to recover any losses through the pricing of the bundle as a whole.

¹⁸ Whether this is a competitively neutral approach is highly questionable, as Telstra is subject to a statutory requirement to provide the services on demand to retail consumers, and hence cannot avoid the fixed costs that obligation entails. A more neutral approach would be to determine a wholesale price that only excluded the variable costs a supplier subject to the obligation would avoid or alternatively, treats as unavoidable those costs that must be incurred so as to be able to meet the service obligation.

The extent of the shortfall can be estimated by reviewing the ACCC's setting of LCS prices for 1999/00 and 2000/01, when it still disclosed detailed information on its cost estimates and methodology.¹⁹ The relevant estimates are set out in Table 1.

Table 1: ACCC local call estimates and under-recovery of costs

	1999/00	2000/01 (GST exclusive)
Total costs allocated to local calls	21.54 cents	21.21 cents
Wholesale local call price	19.26 cents	17.51 cents
Under-recovery per call	2.28 cents	3.7 cents
Number of local calls	11,566 million	11,987 million
Under-recovery of costs (based on ACCC cost estimates)	\$264 million	\$443 million

Three points help explain the Table.

First, the ACCC, when it calculates the cost of PSTN services, allocates costs to all types of PSTN traffic, including local calls.²⁰ For the years here at issue, the Commission allocated PSTN costs of 21.54 cents to each local call in 1999-00 and 21.21 cents to each local call in 2000-01 (see Table 1, first row).

Second, despite that cost allocation, the ACCC, in setting the price for LCS, used a retail-minus approach which involved starting with the retail price of local calls and then deducting the "avoidable" local call retail costs. For 1999/00 through to 2002 the ACCC used an estimate of 2.74 cents per call for retail costs and adjusted this to 2.49 cents when the GST was introduced on 1 July 2000.²¹ As a result, in 1999/00 the LCS price was 19.26 cents per call and in 2000/01 was 17.51 cents per call (see Table 1, second row).

Third, there was consequently an under-recovery of costs for each local call, that under-recovery being of 2.28 cents per local call in 1999/00 and of 3.70 cents per local call in 2000/01 (see Table 1, third row). The aggregate under-recovery was of \$264 million in 1999/00 and of \$443 million in 2000/01. Additionally, the quantum of that under-recovery would have continued to increase up to 2002/03, as local call minutes increased more rapidly than all call minutes until then.

¹⁹ ACCC (2000).

²⁰ The sum of those allocated costs equals total costs, so that total cost recovery in the relevant thought experiment requires that each service be priced in such a way as to recover the share of costs allocated to it.

²¹ ACCC (2002a).

That shortfall is essentially a common cost that the hypothetical builder of the new, wholesale-only network would have had to recover from other services. Consistency with the thought experiment therefore suggests that the shortfall should have been allocated to other PSTN wholesale services, notably PSTN Originating and Terminating Access, and within that, largely to terminating switched access.²² Had that been done, total revenues from the hypothetical network would indeed have equalled total costs, both being evaluated using total call minutes. But the ACCC failed to make any such allocation – rather, it simply ignored the inconsistency in its price-setting.²³

As a result, a cumulative shortfall that (capitalised to the present) probably amounts to close to \$1 billion, was simply placed upon Telstra, which was left with access charges plainly below access costs.

1.4. RELATIVE PRICE DISTORTIONS

Further failures to respect “adding up” constraints have arisen from substitution between declared services caused by inconsistencies in their relative prices.

The approach the ACCC has adopted to declaration has resulted in access charges needing to be determined for a wide range of services that are close, and in some cases very close, substitutes. Errors in setting relative prices for these services will have two consequences:

- They will distort production choices, as access seekers replace inputs that are “over-priced” with those that are “under-priced”. This is a first-order welfare loss (meaning, in this case, a distortion that affects all of output, rather than merely having an effect at the margin); and
- When the “under-priced” services are priced below costs (or make a contribution to common costs that is insufficient to allow all of those costs to be covered), the shift in access seeker demand to these services will prevent full cost recovery (or worsen what would in any event have been losses).

22 Originating and Terminating Access (OTA) involves the origination and termination of switched calls over Telstra’s PSTN (for example, from a calling customer preselected to Optus to a called customer who is preselected to Telstra, where both are connected to Telstra’s Customer Access Network). In general, it is efficient to place higher markups on terminating than on originating access, as it is more difficult for terminating access to be bypassed.

23 It is important to note that had the ACCC allocated the shortfall to other wholesale services, this **would not** mean that the shortfall would have been largely or entirely borne by access seekers. Rather, because the shortfall would have been allocated over **all** minutes of use, each user of the network, including Telstra, would have faced the same unit charge per end-minute-of-use. In contrast, under the ACCC’s approach (of simply ignoring the shortfall), the deficit would only fall on Telstra. This is the natural consequence of the definition of the relevant increment. In the ACCC’s approach, that increment is the total traffic carried over the PSTN. As a result, common costs are unitised over that total. Analytically, the shortfall is merely a common cost to the PSTN as a whole and hence would be spread over all the traffic making use of that network.

1.4.1. Local calls

Access seekers can provide local carriage service over Telstra's network either by using the Local Carriage Service, or by using the PSTN OTA service. The latter involves "over-riding" the default routing of the call by inserting a long distance code in front of the called number and hence is referred to as "Local Call Over-ride" (LCO).

From a technical perspective, LCO is a highly inefficient way of providing local carriage service. An LCO call must use a local switch at least twice (although a quarter or so of local calls would otherwise only use a local switch once), and additionally requires transmission resources to and from the access seeker's Point of Interconnection.²⁴ As a result, a local call made using LCO requires between 1.5 and 2 times the resources actually needed to complete a local call. The additional amount is a pure waste of society's resources.

That waste notwithstanding, LCO accounts for non-negligible share of total local calling minutes. This is because the ACCC prices LCS on an un-timed basis, while pricing PSTN OTA (and hence LCO) on a timed basis (that is, access seekers are charged per minute of use). As a result, it is highly profitable for access seekers to use LCO, rather than LCS, for short-held calls. As local calls generated by businesses tend to be of below-average duration, this can be done by modifying the software businesses have on their PABXs (the private exchanges that manage their traffic) to insert an over-ride code into local calls.

LCO has two effects on the economics of the local carriage service. The first is that it results in the technical inefficiency discussed above. The second is that it aggravates the shortfall Telstra incurs in the supply of local calls.

That shortfall – which results from the ACCC's failure to provide any means of recovering the difference between the costs it attributes to local calls (and hence removes from the rest of the PSTN cost pool) and the price it sets for wholesale local calls – is aggravated because removing short-held local calls from the stock of local calls in and of itself saves very few costs. In effect, the costs of the inter-exchange network (the part of the network that goes between, and includes, local exchanges) tend to be almost completely insensitive to even substantial variations in traffic volumes.²⁵ Moreover, in reality, LCO does not remove those calls but merely re-routes them through the inter-exchange network, potentially increasing the actual costs that Telstra bears. As a result, revenues are obviously reduced while no costs are avoided, reducing the extent of cost recovery even further.

24 The Point of Interconnection is the point at which the call exits the Telstra network and is handed over to the access seeker's network, where it is "turned around" and handed straight back to the Telstra network for termination.

25 For example, using the Hatfield model for seven US States, the percentage of the dominant local exchange carrier's total costs that is traffic sensitive can be calculated as ranging from 15.0 per cent (for Georgia) to 21.1 per cent (for New York). However, increasing traffic by 30 per cent above the default level specified in the model increases total costs in each of the States by less than 1 per cent. The cost savings associated with a similar reduction in traffic levels would be no greater.

1.4.2. Access services

Even more serious distortions have arisen as between the ULLS, WLR and LSS services, which are all access line services. Simplifying somewhat, these services are broadly alternative ways of providing the same set of end-user services, including telephony and ADSL.²⁶

The ACCC has set prices for these services in a manner that creates enormous scope for arbitrage. Underpinning these distortions is the fact that retail prices for line rental services are capped.

Specifically, Telstra has for many years provided basic line rental services throughout Australia at the same price. While this was previously done voluntarily, geographical uniformity of charges was formalised into an enforceable obligation by a price determination issued by the Minister for Communications, Information Technology and the Arts in December 2005.²⁷ As a result, Telstra must offer specified line rental services at the same price in all parts of Australia.²⁸

Whether charges for line rental service cover costs is controversial. It is likely that non-traffic sensitive costs account for 80 per cent or more of total PSTN costs. Were those costs to be covered by line rental charges, those charges would need to be substantially higher than they currently are, at least going by Telstra's estimates of network costs. However, what is clear is that the geographically averaged line rental charge that is applied in non-metropolitan areas is significantly below the costs of providing line rental service in those areas, with the gap being especially large in areas of sparse population settlement.

As with LCS, the ACCC therefore faced a choice in terms of how it set access charges for WLR:

- It could set WLR charges on the basis of cost, which would have resulted in those charges exceeding retail line rental charges in rural and remote areas; or alternatively,

²⁶ The ULLS (Unconditioned Local Loop Service) provides access seekers with the copper pair that runs from a customer's premise to the local exchange. That copper pair can be used to provide voice and/or data services, including ADSL. WLR – the Wholesale Line Rental service – is essentially the Telstra line rental service, and provides the capability to place and receive telephone calls. Combined with LCS and PSTN OTA, WLR can provide the full suite of telephony services. LSS – the Line Sharing Service – allows access seekers to use that part of the spectrum available on a Telstra copper pair that is not required for conventional (circuit-based) telephony. That spectrum – essentially, the higher frequencies – can be used by the access seeker to provide ADSL service. As a result, the combination of WLR and LSS can provide all the services available through ULL, with the exception of some business-oriented data services that require exclusive use of the copper pair.

²⁷ The price determination was pursuant to subsections 154 (1), 155 (1) and 157 (1) of the *Telecommunications (Consumer Protection and Service Standards) Act 1999 (Cth)* (TCPSS Act).

²⁸ Although whether such a constraint exists has been controversial (being disputed by the ACCC and Optus), that there is such a constraint was found by the Australian Competition Tribunal in *Telstra Corporation Ltd (No 3)* [2007] ACompT 3 (17 May 2007) at paras. 218-224.

- It could use a “retail minus” methodology, which would mean that charges would be well below costs, most clearly so in rural and remote areas.

The ACCC has chosen the latter approach.

At the same time, the ACCC has set charges for LSS on the basis of assuming that WLR charges, at least on average, entirely cover network costs, so that all that LSS charges need to cover are some incremental costs.²⁹ Since these costs are assumed to be the same in all areas, the resulting LSS charge is geographically uniform.

Finally, the ULLS charge has been set so as to recover network costs *in each area*. Specifically, ULLS charges have been set by “Bands”, with Band 1 covering the CBDs, Band 2 being the main metropolitan areas (excluding the CBDs), Band 3 being outer metropolitan areas and non-metropolitan population centres (such as regional centres) and Band 4 covering rural and remote areas.

As a result:

- WLR and LSS charges are set on a geographically *averaged* basis, with the sum of these charges being well below costs in non-metropolitan areas;
- ULLS charges are set on a geographically *de-averaged* basis, and hence tend to be well above charges for WLR and LSS in non-metropolitan areas.

This “mix and match” pricing methodology has invited “cherry picking” in which access seekers have swung their demand to the inputs that are relatively under-priced.

The “cherry picking” opportunities arise from the juxtaposition of geographically de-averaged charges for some declared services with geographically averaged charges for others. This juxtaposition makes it possible for access seekers to use the declared services for which charges are geographically *de-averaged* in those areas where costs are *low*, while using the declared services for which charges are geographically *averaged* in those areas where costs are *high*.

Thus, for ULLS, which allows an access seeker to provide both voice and data services, the geographically de-averaged prices mean that access seekers can use Telstra’s CAN at an access price of \$6 per month in CBD areas and \$14 per month in other metropolitan areas (2007/08 prices). The ACCC has not made any determination for ULLS prices in rural areas, and has not disclosed (despite calls for it to do so) any recent estimate of ULLS costs in those areas. However, it has previously suggested that the price of ULLS

²⁹ Originally, those incremental costs were the “LSS specific” costs – that is, the fixed set-up costs of providing and managing LSS. However, the ACCC subsequently changed its view on this and shifted to only allowing the LSS to recover a contribution to the averaged costs of managing all wholesale ADSL services – averaged costs that (given the number of ADSL services now in use) are very small.

in rural areas would be \$100 per month³⁰ and research undertaken by the Productivity Commission suggests that costs in those areas are substantially higher³¹.

Whether the ULLS price in rural areas should be \$100 or \$200 per month is, however, in many respects irrelevant. In effect, the ACCC has set the charges for Telstra's CAN in rural areas on a *geographically averaged* basis. Thus, at the time of writing, access seekers can provide voice services in rural areas using the wholesale line rental service for \$23.12 per month for residential customers and \$25.84 for business customers.³² At the same time, they can provide data service to those same customers using the (also geographically averaged) LSS service. The ACCC's most recent decision on LSS sets a geographically averaged price of just \$2.50 per month.³³ The effective input price access seekers face for the CAN in non-metropolitan areas is therefore capped at some \$26 per month for residential customers and \$29 per month for business customers. These charges are obviously far below costs in those areas, even on the ACCC's estimates.

As a result, the ACCC's wholesale pricing allows the access provider to recover from access seekers *no more than* the cost of the CAN in low cost areas and *well below* the cost of the CAN from access seekers in rural areas. Total recovery must therefore fall short of total costs.

1.5. TIME INCONSISTENCY

The resulting distortions to investment and to build/buy decisions have been aggravated by ACCC pricing decisions which are clearly "time inconsistent".

Time-inconsistency arises when a regulator will have incentives *ex post* to reverse commitments it may have wanted to make *ex ante*.

For example, given that many of Telstra's costs result from past investment that are now sunk, *ex post* the regulator may want to discount some of those costs, thereby reducing user charges. As Telstra's obligations to provide service prevent it from "walking", the temptation for a regulator to gain public standing and political legitimacy by being seen to be "tough", and by forcing down prices, can be very strong. However, those gains come at a steep long-run cost: as the regulated firm comes to expect such "time inconsistent" conduct by the regulator, it either refuses to put new assets at risk or demands a higher risk premium for doing so. As a result, prices must ultimately rise, the quality and range of service must suffer, or both.

30 See for example, ACCC (2003, Table 10.4, p. 84).

31 See Productivity Commission (2000). This research indicates that line costs in low density areas of Australia are 6 to 14 times higher than in the rest of Australia. Given the line density in rural areas of Australia and based on the ACCC's own cost estimates in other areas of Australia this suggests that monthly CAN costs in rural areas are in the order of \$140 to \$209 per line.

32 See ACCC (2006).

33 See ACCC (2007b)

Most regulators therefore try to avoid acting in ways that are “time inconsistent”. Indeed, the ACCC itself, in its approach to regulating electricity transmission, has stressed the risks of “time inconsistency” and sought to make credible commitments to avoid it.³⁴ This has not, however, been its approach in telecommunications, as can be seen from a consideration of the manner in which the ACCC has determined provisioning levels for the PSTN (section 1.5.1) and of depreciation and the PSTN capital charge (section 1.5.2).

1.5.1. Provisioning

In a wide range of circumstances, the minimum cost expansion path for a network involves installing additional capacity in large increments (that is, increments that can expand output by many times the individual units in which output is generally sold). Given this “lumpy” nature of the optimal expansion path, the holding of excess capacity to provision for future demand is generally efficient – a fact recognised since at least Rapp (1939).

The need to provision ahead of demand is especially binding on Telstra, which faces substantial penalties if it fails to meet demand within tight time frames.³⁵ Given those penalties, Telstra has little choice but to sink the capital investment needed to meet growth in, and changes in the location of, demand. The issue which then arises is how much such excess capacity should be held, and given that amount, how its costs – which Telstra must incur – should be recovered.

Were future demand known with certainty, the problem would reduce to that of ensuring that the willingness to pay of future consumers covered the holding cost of the efficient level of pre-provisioning. However, as a general matter, future demand is not known with certainty, and this itself affects the level of pre-provisioning that is efficient, as well as significantly complicating the optimal charging problem. Thus, in industries where it is not possible to hold inventories such as telecommunications and electricity, some excess capacity is needed to subsume the inventory function in the face of demand uncertainty. Higher variability in demand manifests itself in higher investment costs and cost-minimisation then requires a **higher** incremental installed capacity level. In other words, the *more* uncertain nature of demand means that it is efficient to hold *more* excess capacity than would otherwise be the case. This is because a larger capacity level reduces the risk of unmet demand, while the advantages of economies of scale mitigate the risk of a low demand situation.³⁶

34 ACCC (2004b, p.38 and follows).

35 Since 1997, Telstra has been required to make payments to customers when service is not provided to specified time frames; those time frames have been tightened repeatedly since the requirements were first introduced. Additionally, in 2002, the Government introduced a “Network Reliability Framework” (NRF), under which Telstra is exposed to what are effectively open-ended fines should Telstra fail to meet the set time frames for service provision, as well as a range of other indicators of network performance. Those penalties are clearly intended to require Telstra to hold sufficient capacity to respond rapidly to customer demands.

36 That said, if uncertainty is resolved progressively over time, the optimal strategy will involve some deferral of capacity expansion, but with scale economies, excess capacity will continue to be held. See generally Manne (1967). Specific models for optimal provisioning for telecommunications networks are examined in Freidenfelds (1981).

However, the ACCC has sought to either minimise, or entirely deny, cost recovery for forward provisioning. It has, in other words, sought to prevent costs that must be incurred in the present for the sake of efficient future resource use from ever being recovered. We consider first the approach the ACCC adopted initially before examining the ACCC's current view.

The initial ACCC position

In its initial cost modelling, the ACCC's approach was simply to reduce the allowed level of sparing (that is, of excess capacity being held for future demand) in respect of the number of copper pairs provisioned per SIO.³⁷ This amounts to reducing the extent of pre-provisioning in the distribution network (which is the network of ducts, trenches and other forms of cabling that links customers to exchanges).

Telstra's distribution network planning has evolved over time and in so doing has adopted a number of different planning bases (initially per lot of land and later per dwelling) and a number of different assumptions on the copper pairs required per planning base unit (from less than one *per lot* in the late 1950s, rising eventually to two copper pairs *per dwelling* in 1994). These changes have been driven by changing levels of penetration of telephony and increases over time in demand for additional services (successively second lines, faxes, internet, ISDN and now Digital Subscriber Line (DSL)³⁸). Many telecommunications providers internationally adopt far higher levels of sparing than Telstra's two copper pairs per SIO.³⁹

However, in its 2000 assessment of the prices proposed in Telstra's undertaking for PSTN access, the ACCC simply reduced the sparing levels from 2 copper pairs per SIO to 1.33 copper pairs. No explanation was provided of how this lower sparing level, which translated into a smaller required capital stock, could be justified.

Indeed, purely from a network design perspective, it is not clear how it could be implemented without radical network redesign, as a provisioning rule of 1.33 pairs per SIO obviously requires joints servicing dwellings in multiples of three, which has never been attempted in Australia. The costs of developing and implementing the required new

37 An SIO can broadly be taken to be equivalent to an individual service, such as a customer's telephone service.

38 The impact of DSL on optimal provisioning strategy is complex. In the long run, FTTN will reduce, if not eliminate, residential demand for supplementary lines, as multiple logical addresses (for example, multiple phone numbers, all terminating at one destination) can be easily handled over a single physical connection. This reduces the number of pairs required per residential address. However, DSL and the move to FTTN make it important for there to be 'clean' copper in the network, which increases the optimal degree of redundancy. Additionally, the economics of FTTN depend on the ability to pre-provision all lines at each cabinet to high-speed capability. As a result, the transition to FTTN will be characterised by a high degree of provisioning ahead of demand.

39 Additionally, Telstra's modelling reflected provisioning rules that provisioned 1.30 line cards per SIO at the Integrated Remote Integrated Multiplexer (IRIM) (a multiplexer located between the customer premises and the exchange) and 1.18 line cards per SIO at Remote Switching Stages (also a unit placed between customer premises and exchanges) – those being relatively conservative (in the sense of low) levels of provisioning by international standards. The ACCC reduced these to 1.25 line cards per SIO at the IRIM and 1.11 line cards per SIO at the RSS.

design were completely ignored by the ACCC. However, even putting this engineering constraint aside, it is clear that lower levels of sparing would need to be offset by higher levels of operating and maintenance expenditures, as more manual intervention would be required to install new services and repair existing ones.

A rough indicator of the required increase in operating and maintenance (O&M) expenditures is derived in Ergas (2008) using a data set on O&M expenditures by exchange area for the year covered by the ACCC's decision. This estimate is based on a regression model specified as follows:

- O&M hours per SIO as the dependent variable;
- Sparing ratio ((SIOs + Vacant pairs)/SIOs) as the main independent variable; and
- An additional explanatory variable, being the number of requests on which CSG's applied per SIO (to measure the effect of demand for O&M work).

Confining the analysis to those exchanges with sparing no greater than 2.3,⁴⁰ the resulting regression model is statistically significant in overall terms. The model gave a statistically significant sparing coefficient of -0.228. Using an estimate of the total cost of O&M per hour of \$55.20,⁴¹ the estimated coefficient implies that increasing sparing from 1.33 to 2 would lead to an O&M saving of \$8.43 per SIO per month (or \$101.20 per annum).

Given that line costs at a national average level were calculated by the Commission (using the NERA model) at \$336/year (\$28/month) for 1999-00 and \$346/year (\$28.83/month) for 2000-01,⁴² the exclusion of \$8.43 per SIO per month amounts to an under-statement of costs by nearly a third.

The ACCC's later approach

Having initially dealt with the issue of forward provisioning through the arbitrary reduction in sparing discussed above, the ACCC has more recently changed its approach. It now simply denies that sparing is an issue that needs to be addressed, as the decision to hold excess capacity is a "commercial" choice made by Telstra:

40 The data set was truncated to only include exchanges with sparing of less than 2.3 copper pairs per SIO, for three reasons: (1) The resulting sparing range covered the sparing range in dispute – and, indeed, went beyond it to some degree. (2) Although there were exchanges with sparing above 2.3, sparing at levels above a reasonable threshold value was unlikely to result in continued benefits in respect of O&M. Including these in the sample would tend to obscure the relationship under consideration. And (3) higher sparing was likely to be a function of factors unrelated to O&M savings, such as wastage related to low network density, which were not being corrected for in the model.

41 This estimated was derived by dividing O&M expenditure for August by the product of Full Time Equivalent (FTE) staff and an estimate of working hours per month.

42 ACCC (2000, p. 65, Table A2.6).

*Provisioning for spared capacity is a commercial decision. The Commission does not contend that efficient provisioning for future demand is unreasonable. Rather, the Commission contends that the costs of provisioning for future demand should be recovered when that demand eventuates.*⁴³

While it is not clear what this means, the most generous interpretation that can be placed on it is that:

- As the ACCC re-estimates TSLRIC for each year, when higher levels of demand eventuate, those higher levels of demand will be reflected in the capacity specified in the model;
- As a result, the higher costs associated with provisioning will be recouped through the higher cost base that will be estimated for those high demand years.

However, this reasoning is completely flawed. In effect, even in the simplest case, in which demand is known with certainty, simply estimating costs required to serve demand in some years from now will not cover the holding costs associated with carrying the spare capacity from now to that future date. Rather, those holding costs are in effect being written off, i.e. taken as a loss by investors. Had investors known this at the outset, they would never have incurred those costs in the first place.

The losses when demand is uncertain are even greater, as the “high demand” states (for which forward provisioning is being made) may never eventuate. The greater the uncertainty is as to whether that state will eventuate, the greater the penalty to efficient investment (and the loss to investors who have undertaken that investment) will be.⁴⁴

1.5.2. Depreciation and the capital charge

Problems of time consistency have also arisen in respect of the determination of the capital charge, that is, the allowed level of the return on, and the return of, capital.

The capital costs determined in a TSLRIC are essentially a lump of costs, and those costs need to be spread over time. As a general matter, the costs associated with each year will vary – that is, the values associated with year 1 will not be same as those in year 2, which themselves will differ from those in year 3 (and so on). As a result, the choice of which year is taken as a base can matter – that is, the revenue ceiling arising from the estimate will be different depending on whether it is assumed that we are in year 1 (the network has just been built) or in year 10 (the network is now 10 years old).⁴⁵

43 In the Australian Competition Tribunal, File No 8 of 2006, Re: Final decision by the Australian Competition and Consumer Commission dated August 2006 pursuant to Section 1562BU in respect of ordinary access undertakings submitted by Telstra Corporation Limited for the unconditioned local loop service (“ULLS”), By: Telstra Corporation Limited ACN 051 775 556 (Telstra), *Commission’s Response to Questions raised by Tribunal on Day 3, 6 December 2006*.

44 See Productivity Commission (2001, p. 636).

45 The choice of base year is irrelevant if depreciation only reflects price changes but not otherwise – see Ergas (1998).

This issue can be avoided if instead of calculating the capital charge for a particular year, the capital charge is levelised, that is, is set such that its value is equal in each year of the asset's life. Adopting this approach, the annual capital charge would be calculated as:

$$C_l = \frac{r}{1 - (1 + r)^{-n}} \cdot \sum_{t=1}^n \frac{(\bar{w}_t \times r + d_t)}{(1 + r)^t} \quad (1)$$

where C_l is the levelised capital charge;

r is the WACC;

n is the useful life of the asset;

w is the written down value of the asset; and

d is economic depreciation.

The issue of choosing between these alternative approaches first arose in the context of Telstra's PSTN Undertaking for 1997/98. In assessing that Undertaking, the ACCC commissioned NERA, as its expert, to estimate the TSLRIC of PSTN access.

NERA's view, which was clearly expressed in its report to the ACCC,⁴⁶ was that the depreciation profile used in the calculation of TSLRIC must reflect economic depreciation.⁴⁷ If the depreciation profile that is actually used fails to mirror the economic depreciation profile, this will lead to a failure to recover the cost of investment over time.⁴⁸

NERA expressly rejected the use of an annuity approach, stating that it is even less appropriate than straight-line depreciation because a constant annualised capital cost (depreciation plus cost of capital) means that depreciation increases each year, i.e. it is actually back-loaded.⁴⁹ While it is possible to tilt the annuity to allow for price and output declines, NERA argued that it requires a large tilt to achieve a declining depreciation profile over time.

Despite NERA's findings, the ACCC requested NERA to calculate results based on an annuity function. For call conveyance costs, NERA found that using an annuity function

46 NERA (1999).

47 The NERA report defines economic depreciation for any period as the change in the value of the asset during the period. The economic value of an asset at a particular point in time is the present value of expected future revenues derived from the output of the asset less the present value of the operating costs associated with running the asset.

48 NERA (1999, p. 11).

49 NERA (1999, p. 11).

had a significant effect on the results: charges for the Undertaking period were 20 per cent lower than the results obtained using proxy economic depreciation profiles.⁵⁰

In its Final Report on the Assessment of Telstra's Undertaking,⁵¹ the ACCC failed to rely on (or even present) any of the NERA results that used economic depreciation profiles, instead relying solely on the annuity-based results, which were undertaken only as a sensitivity analysis by NERA and only at the suggestion of the ACCC.⁵²

The ACCC has, since that first Undertaking assessment, continued to rely on the tilted annuity for estimating the TSLRIC of both PSTN OTA and ULLS.⁵³ Particularly in the case of ULLS, where asset prices are increasing over time,⁵⁴ the effect of the tilted annuity formula is to steeply back-load the time profile of cost recovery. This is inconsistent with the profile of economic depreciation, as it fails to take into account other factors that impact the declining value of the asset over time such as wear and tear.⁵⁵

However, even putting the contrast with economic depreciation aside, the central problem is that the ACCC *has never brought the deferred costs to account*. Rather, at each assessment it has brought the counter back to zero, thus setting prices in each and every time period "as if" the deferred costs could be simply written off.

The consequences of this approach can be seen from Figure 1. Figure 1 compares actual ULLS charges, as determined by the ACCC, with the charges that would have prevailed had the ACCC respected the time profile of cost recovery as implied by its initial cost modelling.

50 NERA (1999, p.63).

51 ACCC (1999, p. 60).

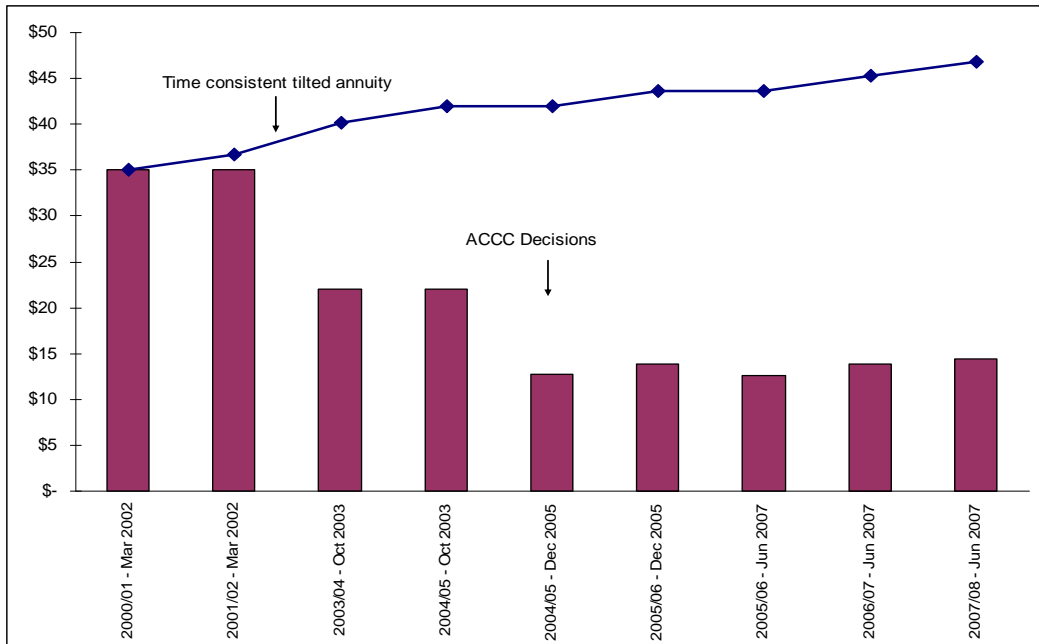
52 See NERA (1999, footnotes 48 and 49, p. 63).

53 The ACCC's tilted annuity, TX_t , is given by $TX_t = (1+g)^{t-1} \cdot V \cdot (r-g) / \{1 - ((1+g)/(1+r))^N\}$ $t = 1, 2, \dots, N$, where V is the cost of the asset, r is the rate of return, g is the tilt factor and N is the asset life. See ACCC (2000, p. 102).

54 The ULLS price decision by the French telecommunications regulator ARCEP provides a very useful discussion of the time profile of cost recovery for ULLS under alternative depreciation approaches. See ARCEP *Décision n° 05-0834 de l'Autorité de régulation des communications électroniques et des postes en date du 15 décembre 2005 définissant la méthode de valorisation des actifs de la boucle locale cuivre ainsi que la méthode de comptabilisation des coûts applicable au dégroupage total*, Paris 2005.

55 This too was noted by NERA, which emphasised that even where asset prices are not falling over time, declining output and rising operating costs may still require a declining (i.e. frontloaded) depreciation schedule – see NERA (1999, p. 11).

Figure 1: ACCC Decisions on Monthly Band 2 ULLS Charges, 2002 to 2007



Sources: ACCC (2002b), ACCC (2003), ACCC (2005b), ACCC (2007a), CRA calculations.

Specifically, the line in Figure 1 above provides an indication of what ULLS prices would have been had a time consistent tilted annuity been applied to the Commission’s initial pricing decision on ULLS. The points traced out by that line are the sequence of charges required for the “fair bargain” to be paid out. The line slopes up as the ACCC’s decision had deferred costs to future years.

However, what the ACCC has done is not to set prices on the basis of that “fair bargain”. Rather, in part by constantly restarting the clock, the ACCC has reduced its estimate of the TSLRIC of ULLS in Band 2 areas from \$35/service/month to just \$13.90/service/month (see bars in Figure 1).

What is striking is not only the extent of the overall reduction (and hence of the departure from the pattern of prices implied by the tilted annuity) but also its pattern. In effect, as estimated by the ACCC, costs largely decrease, often sharply, but there are only exceptionally moderate rises. However, if depreciation in a forward looking cost model is set on an actuarially fair basis, the changes in costs at re-estimation should follow a normal distribution (so long as cost shocks are independent), as it should be as likely that the initial estimate of depreciation (which reflects the anticipated change in asset values) will be an under-estimate as it is that it will be an over-estimate. This obviously contrasts with the pattern of the successive ACCC estimates.⁵⁶

⁵⁶ Of course, it is not impossible that a “technology surprise” would have occurred that reduced costs by some 60 per cent. However, there is no evidence of such a “surprise” nor has the ACCC ever claimed such a “surprise” has occurred.

The best explanation of this outcome is that what the ACCC has done is to ignore the price path implied by its back-loaded depreciation profile, while successively reducing the estimate of the levelised cost. These reductions are equivalent to writing off the amount that (through the back-loading of the annuity) had implicitly been deferred to each period from previous periods.

The extent of the resulting cost recovery shortfall is extremely large in absolute terms. It can be quantified in terms of the loss that would be borne by a hypothetical, wholesale-only, access provider, operating a continuously fully optimised network. That amount, taken as a loss compounded from 2002 to the present at an interest rate of 10 per cent, approaches \$22 billion.

1.6. AGGRAVATED BY PRICE CHANGES

The overall effect of each of the decisions surveyed above has been to set the level of regulated access charges in a way that compromises overall cost recovery. The resulting distortions have been accentuated by the very rapid *declines* the ACCC has mandated in the level of charges, declines that have also changed the relativities between prices in ways that seem in themselves be distorting.

The extent of the price declines that have been imposed by the ACCC is striking and far exceed comparable price trends overseas. Thus, in real (inflation-adjusted) terms, regulated access charges declined:

- For LSS, an annual rate of 28.2 per cent per annum over the period from September 2002 to September 2007;
- For ULLS, an annual rate of 12.7 per cent per annum over the period from April 2002 to September 2007; and
- For PSTN OTA, an annual rate of 7.1 per cent per annum over the period from September 1997 to September 2007;

It is very difficult to believe that costs could have declined at rates anywhere close to the rates mandated by the ACCC. Even on the ACCC's own estimate, total factor productivity in Telstra's fixed network has been increasing at an annual average rate of 5.4 per cent, and (in trend terms) of less than two per cent.⁵⁷ Moreover, even with that total factor productivity growth, input prices (for important items such as copper and trenching) have been rising in nominal terms, as the "China boom" has increased world demand for those inputs. Simulations with Telstra's forward-looking cost model suggest that each one per cent increase in the price of copper-based network elements increases the average cost of ULLS by 0.24 per cent. At the same time, prices for the other key inputs (notably labour

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The ACCC's estimate of 5.4 per cent is heavily influenced by what appears to be a data error in respect of a single year (2000-01). When a trend is fitted, excluding that year, the resulting rate is 1.6 per cent, which is close to the author's own best estimate which is around 2 per cent. The ACCC estimates are in: [http://www.accc.gov.au/content/item.php?itemId=670116&nodeId=87d2b6e9b5f93ed6ede6c61dd8ad1a3d&fn=Final%20report%E2%80%942004%20review%20of%20Telstra%20price%20control%20arrangements%20\(Feb%2005\).pdf](http://www.accc.gov.au/content/item.php?itemId=670116&nodeId=87d2b6e9b5f93ed6ede6c61dd8ad1a3d&fn=Final%20report%E2%80%942004%20review%20of%20Telstra%20price%20control%20arrangements%20(Feb%2005).pdf).

and fuel) have also increased, in both nominal and real terms.⁵⁸ As a result, the expected trend would be for access charges based on replacement costs to be rising – not decreasing at dramatic rates (since these input price rises have exceeded reasonable estimates of total factor productivity growth).

Underscoring this point is the fact that the ACCC's initial access charges – from which these very large declines have occurred – were derived from estimates of costs for a fully optimised network: that is, for a network that had *already* achieved all the efficiencies that could be secured. As a result, productivity growth for this "ideal" network would likely be significantly slower than that achievable in the actual network, as some of the productivity growth in the latter will be "catching up" to best practice (i.e. to the technological frontier). This makes it even more implausible that the declines mandated by the ACCC have any sensible basis in costs.

As well as potential disincentive effects on investment, the price falls have skewed the pattern of use that access seekers make of the various substitutable inputs. More specifically, since July 2002, LSS charges have declined at more than twice the annual rate of decline in ULLS charges to levels that are now the lowest in the OECD area. As a result, LSS use has become extremely attractive, all the more so as the access seeker can (by combining LSS with WLR) place on Telstra the burden of meeting the many social obligations associated with providing telephony (including the Customer Service Guarantees). The result has been a shift from ULLS to LSS, which is apparent in the take-up data.⁵⁹

1.7. CONCLUSIONS

Individual instances of regulated price setting will always be complex and contentious. This will be all the more the case in telecommunications, given its technical complexity and the rate at which telecommunications technology advances. Further complications arise from the wide range of services the ACCC has sought to regulate, a range that includes many services that are substitutes, as well as several for which retail prices are also directly regulated. Given those circumstances, there will always be arguments about any particular instance of regulatory price setting.

However, there can be little real doubt about the overall pattern that emerges from the instances described above. That pattern has three key elements:

- A willingness to set prices below costs, even as those are determined by the ACCC's own cost estimates;

⁵⁸ Prices for electronics have been falling, but electronics accounts for a small share of the cost of a ULLS network. The main cost items in such a network are copper, trenching, maintenance labour and fuel.

⁵⁹ Thus, in early 2004, ULLS use was significantly greater than LSS use, and the forecasts access seekers provided to Telstra suggested that trend would continue (and indeed become more pronounced). By late 2007, LSS use was significantly greater than ULLS use, with a trend growth rate (off a now larger base) that remains above that for ULLS.

- A tendency to exacerbate the resulting shortfalls by distorting relative prices between substitutable services, creating incentives for inefficient arbitrage; and
- A willingness to act in a way that is “time inconsistent”, especially by deferring cost recovery without providing any means by which those deferred costs can ever be recovered.

Under those circumstances, it is unsurprising that access seekers have seen little point in upgrading their existing networks, much less building new ones, while Telstra has become ever more reluctant to invest.

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