

**APPROPRIATE MEASUREMENT (AND RECOVERY)
OF THE 'ACCESS DEFICIT'**

A Report for Optus

Prepared by NERA

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EXECUTIVE SUMMARY

In February 2003 the Australian Competition and Consumer Commission (ACCC) released a discussion paper entitled 'The Need for and ADC for PSTN Access Service Pricing'. Optus has engaged NERA to respond to this discussion paper and specifically to address the questions:

- How should an access deficit be measured?; and
- How should, if at all, any measured access deficit be recovered? In particular, should any access deficit be recovered through an access deficit contribution (ADC) levied on regulated PSTN access services?

In examining these questions we have come to the conclusion that there is no single appropriate measure of an 'access deficit'. Rather, the measurement of the access deficit, and any associated ADC, will depend on what 'deficit' is under consideration. In particular, we have identified three different types of 'access deficit':

- i. Any deficit in revenues received by Telstra relative to future necessary expenditure on the customer access network CAN, ie, ensuring revenues provide Telstra with sufficient incentive to continue operating the CAN.
- ii. Any deficit in revenues received by Telstra relative to the revenues required in order to allow Telstra a 'fair and equitable' return on sunk investments in the CAN.
- iii. Any deficit in costs faced by an efficient potential new entrant in the call conveyance network¹ (CCN) when considering the alternatives of investing in the CCN or relying on Telstra's CCN (via purchase of PSTN O/T access from Telstra).

Each of these three definitions is related to a particular policy goal, respectively:

- minimising prices to end users while ensuring Telstra's future revenues exceed future expenditures;
- ensuring Telstra is treated 'fairly' in relation to its sunk PSTN assets, including avoiding the appearance of unreasonable 'stranding' of sunk assets;
- ensuring that new entrants in the CCN have an incentive to invest if they are at least as efficient as Telstra in providing CCN services.

¹ The traffic sensitive component of the PSTN – including switching and the inter exchange network.

The measured access deficit will be different depending on which of the above definitions is appropriate for the objective at hand. It is useful to note at the outset that TSLRIC is not necessarily a relevant cost benchmark for consideration of the first two objectives. However, this does not represent a criticism of TSLRIC in the context of access pricing per se. Rather for the purposes of measuring an access deficit it may not be the appropriate cost concept.

Telstra's Incentive to Invest

In the ACCC's discussion paper it is argued that Telstra's incentive to invest in the CAN can not be divorced from its incentive to maintain the entire PSTN as a necessary input into all PSTN services. Consequently, the ACCC draws the conclusion that:

“Only if the entire PSTN were in deficit would abandonment of it be a consideration.”
(Page 15)

We tend to agree with this statement. However, even if Telstra could conceivably cease investment in the CAN and still continue to operate the remainder of the PSTN (eg, by ceding ownership of the CAN to the Government or some other business) current revenues would be sufficient for it not to have an incentive to do so. In other words, there is no access deficit in terms of Telstra's incentive to invest in the CAN. However, this is not a particularly interesting finding as all businesses with substantially sunk infrastructure will require considerably less than TSLRIC+ revenues in order to have an incentive to maintain that asset (especially if the infrastructure is comprised of a number of interdependent sunk assets with varying remaining asset lives). Consequently, we believe that the relevant (or 'binding') definition of an access deficit is much more likely to hinge considerations of fairness and new entrant investment incentives (discussed in the following sections).

Nonetheless, if the access deficit is to be measured in terms of Telstra's incentive to maintain ownership of the CAN then the definition of the access deficit should be:

- the present value of future efficient expenditure on maintenance/expansion of the CAN; less
- the present value future net revenues foregone as a result of not undertaking efficient maintenance/expansion of the CAN.

In contrast to the ACCC's estimate of an access deficit this definition derives an access surplus primarily because:

- Telstra ownership of the CAN may confer some monopoly power on Telstra in downstream markets which is not captured in the calculation of CAN revenues;
- the present value of TSLRIC+ exceeds the present value of future CAN expenditure because:

- The present value of TSLRIC costs will exceed the present value of future expenditure on the CAN at all times (both now and in the indefinite future) by the replacement value of sunk assets at the relevant time; and
- TSLRIC+ includes an allocation of organisational level costs that Telstra will not include in any comparison of future revenues and expenditures associated with maintaining the CAN unless those costs are avoided by Telstra's ceasing ownership of the CAN.

Of course, setting Telstra's revenues at the minimum level necessary to cover future CAN expenditure would result in significant stranding of Telstra's sunk costs. This would almost certainly not constitute 'fair and reasonable' treatment of Telstra's sunk costs nor would it be likely to be consistent with appropriate consideration of Telstra's legitimate business interests (discussed in the next section). It is also possible that stranding sunk costs today could engender an expectation of further stranding in the future (both in Telstra and in other businesses regulated by the ACCC). That is, reducing revenues today could create the expectation that future revenues will also be reduced. This may have implications in terms of the incentives to invest.

Nonetheless, it is analytically important to divorce issues of fairness and regulatory precedent from an analysis of whether CAN revenues are sufficient to ensure Telstra has an incentive to maintain ownership of the CAN. We conservatively estimate that even in the absence of an ADC and ignoring any downstream monopoly profits attributable to the CAN, Telstra's annual CAN revenues will exceed annual expenditure by in the vicinity of \$800m. Only if Telstra legitimately expected the removal of the ADC to signal the likelihood that other revenues would also be reduced by over \$800m annually would Telstra's incentive to invest in the CAN be affected.

Fair and Reasonable Treatment of Telstra's Sunk Costs

Economists have no special expertise in deciding what is a 'fair and reasonable' treatment of sunk costs. However, alternatives to the ACCC's current allocation of costs and revenues to the CAN may be able to meet such criteria. In particular, the following considerations may suggest alternative allocations are superior:

- it is likely that recovery of historical costs is more in accordance with fair treatment of sunk costs than is recovery of forward-looking (TSLRIC) costs. This is because, unless regulatory depreciation perfectly anticipates technological change then use of TSLRIC to set revenues will result in windfall losses/gains being incurred by the regulated business;
- Telstra appears to derive significantly more net revenue from its ownership of the PSTN than that included by the ACCC in its calculation of the access deficit, eg, from the sale of optional vertical features;

- to the extent that Telstra derives net revenues in other parts of its (non-PSTN) operations as a result of its historical position as a supplier of the ubiquitous CAN then fairness may suggest that these net revenues offset any access deficit; and
- if an allocation of excess profits from other services to the costs of the CAN is not considered 'fair', it may still be considered 'unfair' to allocate organisational level costs to the CAN (ie, use TSLRIC"+") in calculating the access deficit. This view would hold if it was considered 'unfair' for organisational costs to be recovered once by profits on other services and again through access deficit related charges.²

However, as has been noted by NECG,³ while it may be considered 'fair' to fund any access deficit by a 'profit tax' levied on Telstra's excess profits, it need not be efficient to do so. We would tend to agree with NECG on this point as an 100% tax rate applied to excess profits will almost certainly result in a stifling of innovation by Telstra. However, to the best of our knowledge the prospect of a profit tax being used to fund the access deficit has not been raised in the current debate.

As we understand the debate, the ACCC has raised the prospect of removing the ADC on the basis that Telstra more than recovers any narrowly defined access deficit with excess profits from other services. However, the ACCC has not raised the possibility of monitoring Telstra's profitability and adjusting other revenues earned by Telstra on an ongoing basis. As such, if the ACCC's proposal were to be characterised as a tax, it would not be characterised as a profit tax but rather as a 'poll tax' - which is recognised in the public finance literature as the most economically efficient tax structure. This is because such a 'tax' (traditionally levied on a 'per head' basis) does not vary with any actions undertaken by the payee. To the extent the removal of the ADC is a 'one off' event then Telstra's incentive to innovate in an attempt to earn future excess profits will be undiminished.

Efficient Signals for New Entrant Investment

Scorched node versus scorched earth

The standard economic rationale for the use of TSLRIC in setting access prices is to eliminate the incentive for inefficient bypass of natural monopoly infrastructure. That is, by setting prices at or below the costs of a new entrant the new entrant will have no (inefficient) incentive to duplicate a service already in existence. If the risk of inefficient duplication of natural monopoly infrastructure is to be eliminated then access prices must be based on the new entrant's costs of supply (ie, a scorched earth TSLRIC).

² The inclusion of organisational level costs on top of TSLRIC costs generally reflects fairness considerations as, if all other markets are competitive, then it is possible that an incumbent will not be able to recover all their organisational costs from those markets. However, if other markets are not competitive then this rationale for the use of TSLRIC"+ is less compelling.

However, in the case of the call conveyance network (CCN)⁴ the rationale for the use of TSLRIC is less clear as it is presumed that the CCN is capable of competitive supply (ie, is not necessarily a natural monopoly in all areas). Consequently, it can be efficient for competing CCN's to cover the same areas. This raises the obvious question of why regulate the CCN in those areas in the first place? Ignoring this question here (but addressed in section 5) the potential for competitive supply means that there is a risk that setting access prices below the efficient costs of the incumbent (scorched node TSLRIC) will deter new entrants - even if the new entrant has lower costs than the incumbent.

In summary, access prices can have a role in signalling new entrants not to invest in any circumstance (even if they are lower cost than the incumbent) and in signalling investors to invest only if they are lower cost than the incumbent. Which of these is appropriate will depend on whether the underlying infrastructure is a natural monopoly or not.

Balance of risks

When setting access prices for the incumbent's CCN there is a trade-off between creating too much incentive for investment in the CCN and too little. What point in this trade off is chosen will depend on the cost of each potential 'error'. Ignoring issues of fairness, the economic cost of setting access prices at the incumbent's costs and engendering inefficient entry in a natural monopoly industry is equal to:

- the value of any unnecessary investment induced; plus
- the efficiency loss as a result of prices being set above truly forward-looking costs.

The cost of setting access prices at new entrant costs and preventing efficient entry is equal to:

- the difference between the incumbent and the (deterred) new entrant's long run costs; plus
- any costs associated with unfair treatment of the incumbent (to the extent that the incumbent suffers an unavoidable windfall loss as a result of prices being set below its TSLRIC).

If the probability of each type of error is the same, and if issues of fairness are adequately addressed elsewhere, it would appear that setting prices at the new entrant's costs would minimise the potential cost of regulatory error. This is of relevance to consideration of an

³ "On profits and funding the access deficit", September 2001.

⁴ The traffic sensitive component of the PSTN

ADC to the extent that adding an ADC to access prices based on the incumbent's costs (ie, scorched node) increases the probability of inefficient bypass.

Role of ADC in signalling investment

If it is assumed that the CCN is not in all areas a natural monopoly, it is possible that the ADC has a role to play in signalling efficient investment by new entrants. This is because new entrants in the CCN will have to incur the access deficit associated with the customers they serve (either through building their own CAN or through purchase of ULL from Telstra). Consequently, if an access deficit exists (and would be payable on roll out of a new entrants CCN to customers) but no ADC is included in PSTN O/T access prices then potential new entrants may have an artificial incentive to serve customers via Telstra's PSTN rather than their own CCN – even if they have lower CCN costs than Telstra.

While the above argument in favour of an ADC is intuitively appealing at a high level of analysis, the case for an ADC is much less clear when a thorough analysis is performed. In fact, an ADC as currently calculated will tend to create 'too much' incentive for investment in productively inefficient bypass in most areas of interest to new entrants. This is because:

- signalling efficient investment in the CCN requires the use of TSLRIC not TSLRIC+. This is because a new entrant will not factor in overhead costs into its decision to invest in a CCN unless such investment increases overhead costs;
- net revenues Telstra receives from its PSTN related services but not used to offset the ADC (eg, from optional vertical features) already create a non-cost based incentive for investment in the CCN;
- the ADC paid when serving each customer (or sub-set of customers) over Telstra's PSTN bears little relationship to the access deficit that would be paid by a new entrant if it served those customers over its CCN;
 - This is because the ADC is an average of access deficits across all geographical areas which is then further averaged across all PSTN calls/call minutes. Consequently, customers located in low CAN cost areas with high call volumes will attract significantly more ADC than would be incurred in actually serving them over a competing CCN. Consequently, the ADC creates an artificial incentive to invest in competing CCNs serving those areas/customers; and
- the CCN is almost certainly a natural monopoly in a large number of areas.

Distortion of Retail Prices by ADC

The imposition of an ADC on variable PSTN O/T rates has the effect of increasing the cost of calls above cost and creating an artificial disincentive for retail customers to reduce usage of the PSTN (ie, to make fewer calls). To the extent that demand for calls (and in particular long distance calls) are more price sensitive than connection to the PSTN then using an ADC to finance any 'access deficit' (however defined) will result in a loss in consumer welfare compared to either:

- financing the access deficit through a reduction in Telstra's profitability from its current levels; or
- rebalancing.

NERA believes that this basic conclusion is well understood by all parties to the current debate in Australia. Nonetheless, it is useful to note that precisely this conclusion has driven reform of ADC schemes throughout the world including in:

- Canada (See CRTC, Changes to the Contribution Regime , Decision 2000-745, 2000);
- the EC (See, for example, *Commission Recommendation on Interconnection in a liberalised telecommunications market*, 1998); and
- the US (see, for example, the FCC's *Access Charge Reform Order*, 1997).

Summary

In summary it does not appear that any access deficit exists in terms of the first two definitions considered, ie, capacity to finance future investment and fair treatment of sunk costs. It is possible that an access deficit may exist in relation to the signalling of efficient investment by new entrants. However, while this could be true in an 'average' sense, it is unlikely to be true in those areas where potential new entry is most likely, ie, highly urbanised areas especially containing high concentrations of business customers. In addition, the inclusion of an ADC in PSTN O/T access charges creates potentially significant distortions in the consumption decisions of final consumers.

Given these consideration we consider that it would be a reasonable decision by the ACCC to remove the ADC from PSTN O/T charges.

1. INTRODUCTION AND BACKGROUND

1.1. Background and Report Structure

In February 2003 the Australian Competition and Consumer Commission (ACCC) released a discussion paper entitled 'The Need for and ADC for PSTN Access Service Pricing'. Optus has engaged NERA to respond to this discussion paper and specifically to address the questions:

- How should an access deficit be measured?; and
- How should, if at all, any measured access deficit be recovered? In particular, should any access deficit be recovered through an access deficit contribution (ADC) levied on regulated PSTN access services?

This report will explain why we have reached the conclusion that there is no single appropriate measure of an 'access deficit'. Rather, the measurement of the access deficit, and any associated ADC, will depend on what 'deficit' is under consideration. In particular, we have identified three different types of 'access deficit':

- i. Any deficit in revenues received by Telstra relative to revenues required to provide Telstra with sufficient incentive to invest in the efficient maintenance and expansion of the customer access network (CAN).
- ii. Any deficit in revenues received by Telstra relative to the revenues required in order to allow Telstra a 'fair and equitable' return on sunk investments in the CAN.
- iii. Any deficit in costs faced by an efficient potential new entrant in the call conveyance network⁵ (CCN) when considering the alternatives of investing in the CCN or relying on Telstra's CCN (via purchase of PSTN O/T access from Telstra).

The following three sections discuss how an access deficit could be measured consistently with each of the above three definitions. Section 5 discusses the overall economic efficiency implications of each definition and section 6 summarises our conclusions. At relevant points in the analysis we have drawn on regulatory precedent in other jurisdictions to highlight where different approaches have been adopted.

⁵ The traffic sensitive component of the PSTN – including switching and the inter exchange network.

1.2. Legislative Criteria

- In the matters under consideration, the ACCC must make its decisions consistent with the legislative criteria established in Part XIC of the Trade Practices Act. The object of Part XIC is to promote the long-term interests of end-users of carriage services or of services provided by means of carriage services.

In assessing this objective the ACCC must have regard to, inter alia, the following matters:

- i. whether the terms and conditions promote the long-term interests of end-users of carriage services or of services supplied by means of carriage services;
- ii. the legitimate business interests of the carrier or carriage service provider concerned, and the carrier's or provider's investment in facilities used to supply the declared service concerned; and
- iii. the economically efficient investment in the infrastructure by which listed services are supplied.

In this report we reach the conclusion that each of the above numbered considerations is consistent with each of the previously numbered potential definitions of an access deficit. However, we note that the criteria above are interdependent. In some cases promoting one criterion will promote another. In other cases, the criteria are conflicting. For example, an access price that promotes the economically efficient use of infrastructure in the short or long term, in some cases, may not be consistent with the legitimate business interests of the access provider.

In addition to promoting the economically efficient use of, and investment in, infrastructure, the access regime established by Part XIC attempts to open up to competition markets which are potentially competitive but where the scope for competition depends on the services of bottleneck facilities.⁶ The access price should allow more efficient sources of supply to displace less efficient sources within these potentially competitive markets. However, the access price should also allow vertically-integrated firms to exploit economies of scale and scope to deliver services to end-users at least cost to the extent that these exist.

⁶ A bottleneck facility is used to provide services that are necessary inputs for firms to supply in dependent (upstream or downstream) markets. A bottleneck facility is usually uneconomic or impossible to duplicate. As such, there is scope for the owner of a bottleneck facility to reap abnormally high profits through restricting the supply of services from the infrastructure or demanding monopoly rents for use of that facility, thereby reducing competition in dependent markets.

2. THE EXISTING CALCULATION OF THE ACCESS DEFICIT

The ACCC's current calculation of the access deficit is equal to an estimate of the cost of the CAN less an estimate of the revenue from the CAN. The cost of the CAN is estimated as:

- the total service long run incremental cost (TSLRIC) of the CAN; plus
- line rental retail costs; plus
- an allocation of organisational costs;

The revenue from the CAN is estimated as:

- line rental revenue; plus
- line connection revenues; plus
- net universal service funding.

The TSLRIC of the CAN is equal to the annualised cost of replacing and maintaining the CAN in its entirety given current equipment and other costs (using Telstra's existing switch placements rather than optimised switch placement).

3. TELSTRA'S INCENTIVE TO INVEST IN THE CAN

In the ACCC's discussion paper it is argued that Telstra's incentive to invest in the CAN can not be divorced from its incentive to maintain the entire PSTN as a necessary input into all PSTN services. Consequently, the ACCC draws the conclusion that:

"Only if the entire PSTN were in deficit would abandonment of it be a consideration."

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We tend to agree with this statement. However, even if Telstra could conceivably cease investment in the CAN and still continue to operate the remainder of the PSTN (eg, by ceding ownership and operation of the CAN to the Government or some other business) current revenues would be sufficient for it not to have an incentive to do so. That is, even if Telstra could give away ownership of the CAN it would not do so as the cost to it in terms of CAN revenues foregone would exceed the benefit in terms of future expenditure avoided. In other words, there is no access deficit in terms of Telstra's incentive to invest in the CAN. We note, however, that this is not a particularly interesting finding as all businesses with substantially sunk infrastructure will require considerably less than TSLRIC+ revenues in order to have an incentive to maintain that asset (especially if the infrastructure is comprised of a number of interdependent sunk assets with varying remaining asset lives). Consequently, we believe that the relevant (or 'binding') definition of an access deficit is much more likely to hinge considerations of fairness and new entrant investment incentives (discussed in the following sections).

Nonetheless, if the access deficit is to be measured in terms of Telstra's incentive to maintain ownership of the CAN then the definition of the access deficit should be:

- the present value of future efficient expenditure on maintenance and expansion of the CAN in order to meet the universal service obligation (USO); less
- the present value future net revenues foregone as a result of not undertaking efficient maintenance and expansion of the CAN in order to meet the USO.

3.1. Organisational Costs Not Relevant to Incentives to Invest in the CAN

The ACCC's current calculation of the access deficit is based on TSLRIC+ which includes an allocation of organisational level costs. However, Telstra will only take such costs into account when deciding to continue investing in the CAN if:

- these costs would be avoided if Telstra ceases investing in the CAN; or

- future revenues from the entirety of Telstra's operations are not expected to recover all future costs (including organisational level costs) - in which case Telstra would rationally cease to operate not just the CAN but all services.

It is not obvious that Telstra would avoid the organisational level costs currently allocated to the CAN if Telstra ceased operation of the CAN (as these costs are shared by the entire business). Similarly, the ACCC's profitability analysis in section 4.2 of its discussion paper appears to show Telstra's revenues from other operations more than recover organisational costs. If this is the case, any failure to recover these costs from the CAN would not cause Telstra to cease operations all together ie, the CAN and all other services.

For the above reasons it does not appear likely that Telstra's incentive to retain ownership of the CAN would require revenues to recover an allocation of organisational costs.

3.2. ACCC's CAN Revenues Underestimate True Revenues Foregone

The ACCC's estimate of CAN related revenues received by Telstra include line rental, line connection and USO payments. However, this may significantly underestimate the net revenues that Telstra would forego if it did not retain ownership of the CAN. This will be true to the extent that ownership of the CAN confers monopoly power on Telstra in relation to the sale of other services. We discuss these issues more fully in the following section, which deals with the fair and reasonable treatment of Telstra's sunk investments in the CAN.

3.3. TSLRIC Revenues Exceed Future CAN Expenditure

If Telstra were to receive TSLRIC based revenues then there would always be a surplus of revenues compared to future expenditures to the extent that:

- there are sunk⁷ assets associated with the CAN;
- the replacement of sunk assets is spread over time; and
- Telstra does not have the option to allow the CAN to lose functionality in some areas while still receiving revenue from customers in areas where the CAN is still operational, ie, Telstra must meet the service standards across the entire CAN or lose the right to all revenues from the CAN.

⁷ Telstra's existing investment in the CAN is primarily sunk in the sense that CAN assets have little or no value in uses other than providing access to the fixed line telephone network.

The reason that the present value of TSLRIC based revenues will tend to exceed the present value of future expenditure under the above conditions can be seen from the following definition of TSLRIC⁸.

$$\begin{aligned} \text{PV of TSLRIC revenues} &= \text{PV of (O\&M expenditure + return on existing (sunk) assets +} \\ &\quad \text{return of}^9 \text{ existing (sunk) assets).} \\ &= \text{PV future expenditure (as all this will translate into O\&M and} \\ &\quad \text{return on/of any future capital expenditure) + PV of return} \\ &\quad \text{on/of existing (sunk) assets.} \end{aligned}$$

Clearly, if there exist sunk assets at the time the calculation is undertaken then:

$$\text{PV future TSLRIC revenues} > \text{PV future expenditure}$$

With the difference between the left and right sides of the equation equal to the component of TSLRIC revenues that relates to sunk investments. This means that TSLRIC revenues will always (ie, in the long run even after all existing sunk assets will require replacement) be in excess of revenues a business will require to maintain an infrastructure asset at its existing functionality, provided:

- some sunk assets are always required for operation of the infrastructure (without this condition a business will simply sell all existing assets if revenues fall below TSLRIC);
- not all sunk assets will need simultaneous replacement (without this condition the business may maintain the infrastructure up to the time of replacement of sunk assets but will not re-invest in additional sunk assets, ie, , if all sunk assets require simultaneous replacement, then PV TSLRIC revenues = PV future expenditure); and
- the infrastructure asset is integrated/interdependent in the sense that loss of one asset will reduce the functionality of others (without this condition the business may progressively shed functionality as sunk assets wear out without losing revenue being earned on functionality provided by other sunk assets).

In a competitive market if a business is operating with sunk assets with various remaining asset lives then it may well stay in business in the long run even if future revenues are always less than TSLRIC. Of course, it would not enter the business under these conditions.

⁸ For simplicity in the following analysis we assume that all assets once invested are sunk, the conclusions of the analysis do not depend on this simplifying assumption.

⁹ "Return of" capital signifies recovery of depreciation costs.

However, if it is already in business then it may well still stay in business in the long run. (Appendix A provides a mathematical illustration of this point.)

3.3.1. Relevance of TSLRIC > future expenditure

Of course, providing Telstra with the minimum revenue required to cover future expenditure would effectively involve an expropriation of Telstra's sunk investments in the existing CAN. We do not believe that such an approach would be appropriate and we are unaware of any serious argument that such an approach would be appropriate (consideration of Telstra's legitimate business interests is discussed in the next section). Such a policy would also likely create uncertainty surrounding the fairness of future actions of the ACCC in this and other regulated industries.

Unfair treatment of sunk costs can create uncertainty about the future treatment of investments not yet sunk. Unwillingness to invest may also be rational (notwithstanding the fact that future revenues more than recover future expenditures) if Telstra reasonably expects the ACCC to further reduce revenues in the near future (below the level that would cover future expenditures). However, as discussed immediately below it is not clear that removal of the ADC would constitute unfair treatment of Telstra's sunk costs. Further, it does not appear that any decision that the ACCC takes in relation to the access deficit could reasonably engender such an expectation of future revenue reductions on the part of Telstra management.

3.3.2. Estimate of the surplus in CAN revenues over expenditure

With available information it is difficult for NERA to estimate exactly the present value of future CAN revenues and future CAN expenditures. However, we note that the ACCC's assessment of the access deficit in 2000-01 was based on an assumption of revenues of \$2,811m¹⁰. These revenues do not include any revenues from the ADC and do not include any revenues generated by monopoly power conferred on Telstra by ownership of the CAN.

On the expenditure side, the ACCC's discussion paper provides CAN related capital expenditure figures over an 8-year period with the average being \$890m¹¹ in 2001. Even if Telstra's operating and maintenance costs were as high as its average capital expenditure (which appears to us a highly conservative assumption) then total revenues would exceed total expenditure by \$869m per annum (or around 40 percent of line rental revenues). Assuming a 10 percent discount rate and a constant annual difference between revenues and expenditure, the present value of this net income stream is equal to \$8,690m. On this basis

¹⁰ ACCC, "A report on the assessment of Telstra's undertaking for the Domestic PSTN Originating and Terminating Access services" July 2000.

¹¹ It is not clear whether these figures are nominal or real.

we consider that it would be unlikely for Telstra to cede ownership and responsibility for the CAN – even in the hypothetical situation where this was practicable.

This is not to say that Telstra's revenues should be reduced in order to eliminate this surplus. Doing so would result in a significant level of stranding of Telstra's sunk assets (discussed below). Rather, it is important that the debate surrounding the access deficit is fully informed in the knowledge that there is no credible probability that removal of the ADC would create an incentive for Telstra to stop investing in the CAN. As discussed below, the present value of current CAN revenue streams will remain significantly above the present value of CAN related expenditures in the long run - with or without an ADC.

4. FAIR AND REASONABLE RECOVERY OF TELSTRA'S SUNK COSTS

While current revenues may be more than sufficient to provide Telstra with an incentive to invest in the maintenance of CAN functionality, this tells us little about whether current revenues reflect a 'fair and reasonable' return on Telstra's sunk investments in the CAN. An alternative definition of the 'access deficit' is the difference between revenues reflecting a fair and reasonable return on sunk CAN assets and revenues actually received by Telstra. This definition would presumably be the definition adopted if sole weight was placed on the legislative requirement to consider Telstra's 'legitimate business interests'. When an access deficit is defined in these terms there are a number of reasons to question whether the ACCC's current definition of an access deficit is appropriate.

Historic Costs versus Forward Looking Costs

The ACCC's current definition of the cost of the CAN uses TSLRIC to value all existing assets at their forward-looking replacement cost (FLRC). TSLRIC uses forward-looking costs to set access prices that provide an important signalling role for new entrants. However, it is not clear that FLRC alone is an appropriate proxy for the fair and reasonable value of the incumbent's historically sunk assets. While economists have no special expertise in determining what constitutes 'fair treatment', there is no obvious reason to prefer FLRC over historic costs. Indeed, once the issue of efficient bypass (discussed in the next section) is separated out from the analysis of 'fair treatment' it may well be reasonable to prefer the use of historic¹² rather than FLRC when determining fair value of sunk assets.

The reason for this is that basing future revenues on FLRC can lead to windfall losses/gains to the regulated business if movements in FLRC are not fully anticipated in prior regulatory depreciation rates. For example, if technological innovation results in an unexpected reduction in replacement costs then the regulated business will suffer a windfall loss if revenues are based on FLRC. Similarly, if replacement costs rise over time (eg, if trenching costs increase) then the regulated business will receive a windfall gain - unless a negative depreciation rate was previously applied to these assets in the calculation of TSLRIC revenues.

In contrast, it is arguable that an appropriate interpretation of Telstra's legitimate business interests would be that Telstra should be able to recover its sunk costs provided those sunk costs were prudently incurred at the time of the relevant investment. If this position were accepted, and fair treatment were the sole objective, then it would be appropriate to value existing sunk assets on their historic costs less accumulated depreciation (provided that the investment was prudent at the time it was incurred). From a 'fairness' perspective such an

¹² By historic cost we refer to the original investment cost incurred by the regulated business. This cost would then be indexed to inflation and reduced by any accumulated depreciation revenues received by the business (in the form of revenues received above a normal return on capital).

approach would have the benefit that a regulated business would recover no more and no less than it prudently incurred in the operation of its business. Indeed, such an approach may also have benefits from the incumbent's investment incentive perspective to the extent it removes uncertainty inherent in the future FLRC valuation of assets.

In implementing such an approach it would be necessary to determine both the (inflation adjusted) value of historic asset costs and the value of accumulated depreciation. In this fairness context, accumulated depreciation would reflect the difference between past revenues and a reasonable rate of return on historic cost. To the extent that past revenues exceeded a reasonable rate of return on historic costs then this reflects a return of the value of the initial investment (ie, an implicit compensation for depreciation) and the depreciated value of historic costs would fall accordingly. If past revenues did not recover a reasonable rate of return on historic costs then it is possible that accumulated depreciation could be negative. The level of accumulated depreciation under this definition will critically depend on what revenues are included in the calculation of what Telstra's past rate of return had been (discussed below).

The ACCC has addressed the use of historical costs in its February 2003 discussion paper, and on page vi it asks the question:

“Should costs of lines be measured using historic cost accounts (such as the RAF) to reflect the actual financial cost of the AD rather than the costs estimated using either the n/e/r/a or PIE models? How would this approach be reconciled with the Commission's forward-looking approach to access price determination?”

In response to this question we would answer that there may well be a strong case for defining the access deficit using historic costs to the extent that the ACCC is concerned primarily with addressing Telstra's legitimate business interests. In this context, there is no need to reconcile this with the forward looking costs used in the NERA or the PIE models as the use of forward looking costs in these models is primarily aimed at avoiding creating any incentive for inefficient bypass of Telstra's PSTN (discussed in the following section). The Commission also note on page 13/14 of their discussion paper that:

“However, the Commission's estimate of historic cost based economic profits of the PSTN for 2001-02 suggest that Telstra would still have earned substantial economic profits, even in the absence of an ADC on access charges.”

NERA is not in a position to comment on the validity of this statement and we are unsure if the Commission's analysis includes an explicit or implicit estimate of accumulated depreciation as defined above. However, to the extent that it is true then adopting an historic cost definition for the purpose of setting the access deficit is likely to be consistent with the legitimate business interests of Telstra and also be in the long-term interests of end users (as it would lower prices). It is also true that the long-term interests of end users would likely be increased significantly more than the loss to Telstra as a result of any reduction in the estimate of the access deficit. This is because the ADC currently results in

prices exceeding costs for services downstream to the PSTN and these services, such as long distance, tend to be price sensitive. Consequently there is likely to be a substantial efficiency gain to consumers (which is not a loss to Telstra) from the reduction/removal of the ADC. Furthermore, this would not impact on Telstra's incentive to maintain the CAN as discussed above.

Fair Allocation of Joint and Common Costs

The ACCC's current definition of an access deficit includes an allocation of joint and common costs (eg, organisational level costs) to the TSLRIC of the CAN (the sum of these is termed TSLRIC+ by the ACCC). Any such allocation is inevitably arbitrary and it is difficult to come to a definitive conclusion as to what, if any, is a 'fair' allocation of these costs to the CAN. Organisational level costs must be recovered in full from all of Telstra's services in order for Telstra to earn a 'fair and reasonable' rate of return on all its investments. Nodoubt this consideration largely drove the ACCC's decision to adopt TSLRIC+ rather than TSLRIC in its cost modelling.

However, if Telstra is more than recovering its organisational level costs from other services it is difficult to see how fairness requires that Telstra effectively recover these costs twice (by allocating some portion of them to its regulated PSTN services despite the fact that they have been fully recovered by net revenues from other services). A similar position was put by consultants to the European Commission when examining the desirability of an ADC on fairness grounds.

*"Among other things, treating the AD issue as a compensation issue rather than a price signalling problem will provide for a level of double collection by the incumbent where a level of 'other' subsidies are maintained, i.e. cases where interconnection prices are not cost-based, international and long distance sectors are not thoroughly competitive, or an official universal service fund operates."*¹³

In section 4.2 of its discussion paper the ACCC puts forward evidence that Telstra is indeed more than recovering its organisational level costs both as a business and in respect of the PSTN alone.

Once more, NERA is not in a position to comment on the evidence put forward by the ACCC. However, to the extent that it is valid then removing organisational level costs for the purpose of setting the access deficit is likely to be consistent with Telstra's legitimate business interests. To the extent that this resulted in a reduction/removal of the ADC then, as discussed above, this would be in the long-term interests of end users

¹³ Study on Universal Service in the Accession Countries, Main Report Annexes to Main Report June 30, 2001 produced for the European Commission under Study contract no 71080 by Cullen International SA and Wissenschaftliches Institut für KommunikationsdCCNste GmbH. Page 50.

and would reflect an overall 'positive sum gain' (ie, the benefit to end users would exceed the loss to Telstra).

4.1. Fair Definition of Revenues

As the ACCC has noted, ownership of the CAN cannot meaningfully be separated from ownership of the PSTN. Indeed, the ubiquity of Telstra's entire PSTN (including the CAN) gives rise to Telstra's substantial market power in a number of markets (as discussed below) and it is not surprising that the ACCC has found that the PSTN as a whole is highly profitable. If PSTN revenues exceed PSTN costs overall then any 'loss' on the CAN must be more than made up by a 'gain' on the remainder of the PSTN. Imposing an ADC to increase Telstra's revenues 'derived'¹⁴ on the remainder of the PSTN effectively ensures that the 'loss' on the CAN is recovered (at least) twice. It is therefore important that a strong case be made for why such an outcome is appropriate.

The ACCC's current definition of an access deficit reflects an estimate of TSLRIC+ CAN costs less line rental, USO and connection revenues. This definition of revenue does not include net revenue (ie, revenue above economic costs) from the sale of services in which Telstra's ownership of the PSTN gives it some market power in the sale of those services.

It appears likely to us that most definitions of a 'fair' allocation of revenues to the CAN would include the revenues of the type described by the first dot point. That is, if above economic profits on some (unregulated) services result directly from Telstra's ownership of the PSTN then these excess profits should be used to offset the costs of the CAN before requiring access seekers to pay for the unrecovered costs of the CAN.

4.1.1. Examples of Monopoly Profits

Vertical features

A strong case can be made excess profits earned on the sale of vertical features (such as call waiting) should be included in the calculation of any access deficit. These services can only realistically be supplied by the owner of the CAN (or lessee of the CAN through the purchase of ULL service from Telstra).

It is common to include net revenues from the sale of vertical features in that calculation in other jurisdictions. The Canadian Radio television and Telecommunications Commission (CRTC) recently decided that an implicit subsidy towards the cost of the CAN from the sale of 'switch based optional services' of \$60 Canadian per line per annum was appropriate.¹⁵

¹⁴ Inverted commas are used here as if the CAN can not meaningfully be separated from the remainder of the PSTN then it is not meaningful to consider revenues being solely derived from one or the other.

¹⁵ Decision CRTC 2000-745 Ottawa, 30 November 2000, para 74

Were equivalent amounts included in Australia it would largely eliminate the ACCC's existing estimate of an access deficit.

US state regulators also offset net revenues from the sale of vertical features (and other services) against estimates of any access deficit. As was noted by the FCC:

*"Implicit Support. In addition to receiving explicit universal service support, LECs also received implicit universal service support from a variety of sources. Some state rate structures have permitted LECs to charge rates for certain services that significantly exceeded the costs of providing those services, thereby enabling those LECs to charge below-cost rates for other services. For example, by charging above-cost rates for vertical services (e.g., caller identification, call waiting), carriers can support the rates for basic local service."*¹⁶

Optus has submitted that Telstra's year-end results for 30 June 2002 show revenues from the sale of vertical features totalled \$167 million. It is not clear that there will be significant additional costs incurred by Telstra in selling these products. Consequently, it is likely that the majority of these revenues can be treated as revenues above costs and therefore available to offset any otherwise calculated access deficit.

Whatever the level of current excess revenues from these services it is important to ask whether such revenues will exist into the future? As NERA understands the dynamics in the Australian telecommunications market, there is no prospect of competitive pressure from new CCN entrants competing away excess profits on Telstra's sale of vertical features. We understand that connecting a customer to a new entrant's CCN via ULL will not be economic unless that customer purchases broadband services from the new entrant and lives in a densely populated area. Given that the great majority of residential end-users do not purchase broadband services and many do not live in densely populated areas there will be little if any competitive pressure on Telstra in relation to the price charged for vertical features to those customers.

Broadband services

Telstra may also be able to exploit market power associated with ubiquity of its PSTN to extract net revenue from the sale of broadband services over the CAN. Once more, it is unlikely that competition over the ULL for these services will eliminate any such market power in the foreseeable future. Competition will inevitably be limited by the ability of new entrants to gain sufficient economies of scale in a particular Telstra exchange area in order to justify the expense of selling services over the ULL in that exchange area. Consequently, it is likely that competition would only ever be expected to constrain Telstra's prices in a limited number of exchange areas.

16 FCC, In the Matter of Access Charge Reform, Sixth Report and Order in CC docket nos. 96-262 and 94-1, para 23.

Furthermore, NERA understands that for technical reasons a new entrant will not be able to provide the range of broadband services currently supplied by Telstra using circuit switched technology over the PSTN (such as ISDN and DDS). Rather, at the moment any new entrants would need to focus on xDSL technology, which is more expensive (and better quality) than some alternatives Telstra can offer (such as ISDN/DDS). This means that Telstra will continue to have market power in the provision of low cost/low quality broadband services (such as ISDN) even if a new entrant is providing xDSL in that customer's Telstra exchange area. In addition, xDSL only serves as a competitor for other broadband services for customers located within several kilometres of their local exchange. Taking these considerations on board, we would not expect new entrants to be able to compete away Telstra's monopoly profits in the provision of broadband in the foreseeable future.

In any event, to the extent that competition does result in a large number of customers being served by new entrants over the ULL this may tend to reduce the access deficit as Telstra faces no access deficit in the supply of the ULL. In the extreme, if new entrants captured 100% of the market via the ULL service Telstra would fully recover TSLRIC+ costs of the CAN. However, if there are some customers for whom there is an access surplus then new entrants winning those customers will tend to increase the size of any remaining access deficit.

We note that the TSLRIC modelling already reduces the size of the estimated access deficit somewhat to reflect the fact that Telstra's broadband services use the CAN. This has been achieved by allocating CAN costs to these services in proportion to their physical sharing of CAN assets. However, it is arguable that a 'fairer' allocation of CAN costs would be on the basis of each services contribution to Telstra's profitability. Alternatively, instead of allocating costs "out" of the CAN additional costs and revenues associated with these services could be allocated "into" the CAN (and the calculation of the access deficit). Such an approach would be equivalent to allocating net revenues against any access deficit. However, as discussed below, such an approach needs to be addressed with some caution in terms of the potential impacts on Telstra's incentives to provide these additional services.

4.1.2. A profit tax?

NECG¹⁷ has noted the potential for this type of impact on incentives. While it may be considered 'fair' to fund any access deficit by a 'profit tax' levied on Telstra's excess profits, it need not be efficient to do so. We would tend to agree with NECG on this point since a 100% tax rate applied to excess profits will almost certainly result in a stifling of some innovation by Telstra. However, to the best of our knowledge the prospect of a profit tax being used to fund the access deficit has not been raised in the current debate.

As we understand the debate, the ACCC has raised the prospect of removing the ADC on the basis that Telstra more than recovers any narrowly defined access deficit with excess profits from other services. However, the ACCC has not raised the possibility of monitoring Telstra's profitability and adjusting other revenues earned by Telstra on an ongoing basis. As such, if the ACCC's proposal were to be characterised as a tax, it would not be characterised as a 'profit tax' but rather as a 'poll tax' - which is recognised in the public finance literature as the most economically efficient tax structure. This is because such a 'tax' (traditionally levied on a 'per head' basis) does not vary with any actions undertaken by the taxpayer. To the extent the removal of the ADC is a 'one off' event then Telstra's incentive to innovate in an attempt to earn future excess profits will be undiminished.

Precisely this issue was recognised by the Canadian Radio television and Telecommunications Commission (CRTC). The CRTC decided that, in order to enable other high profit services to make a contribution to the costs of the PSTN while still preserving incumbents' incentives to continue to make those services profitable, a fixed per line implicit subsidy which is the same for all incumbents and which is not revisited during the price control period would be assumed.

"In the Commission's view, the use of a common implicit subsidy target will provide LECs an appropriate incentive to generate margins from the various residential local optional services. Under this approach, the risks and rewards associated with achieving the pre-determined target amount of the implicit subsidies will be borne entirely by the LECs..."¹⁸

¹⁷ "On profits and funding the access deficit", September 2001.

¹⁸ Decision CRTC 2000-745 Ottawa, 30 November 2000, para. 72

5. NEW ENTRANT INVESTMENT INCENTIVES

There is potentially a role for an ADC in setting efficient build-buy incentives for new entrants in the PSTN. However, before tackling this question in detail it is important to carefully set out the rationale for the use of forward-looking costs in setting such incentives. In doing so we will also hopefully identify some sources of confusion in the discussion to date on this issue.

5.1. Telstra or New Entrant's TSLRIC (scorched node versus scorched earth)?

The standard rationale for the use of TSLRIC in access pricing relates to the regulation of access to bottleneck (natural monopoly) infrastructure. For such services the standard presumption is, by definition, that it is inefficient for a new entrant to duplicate that infrastructure as it is a natural monopoly. If access prices are set above the forward-looking costs of the new entrant (ie, scorched earth TSLRIC) then it may be commercially profitable for a new entrant to duplicate all or part of that infrastructure in order to avoid paying the (above forward-looking cost) access charges.¹⁹ From this perspective, TSLRIC is a maximum level for access prices that can be set without the risk of creating incentives for inefficient bypass. It is also important to note that it is the forward-looking cost of the new entrant (ie, scorched earth TSLRIC) not the forward-looking cost of the incumbent (ie, scorched node TSLRIC) that is relevant in this case. This follows axiomatically from the fact that the new entrant will decide whether or not to enter on the basis of whether or not access prices are above the costs it would incur if it (inefficiently) duplicated the existing infrastructure.

However, in the case of the PSTN the analysis above is complicated by the fact that the traffic sensitive call conveyance network (CCN) component of the PSTN is not a pure natural monopoly. That is, the *a priori* assumption is not that a new entrant in the CCN would inefficiently duplicate Telstra's existing assets. Rather, a strong presumption exists that in some circumstances facilities based competition via investment in alternative CCN networks need not involve wasteful duplication of existing assets. This raises the possibility of access prices not only being set too high (and encouraging wasteful duplication) but also being set too low (and discouraging efficient replacement of the incumbent's network). In this regard it may be the forward-looking cost of the incumbent (not the forward-looking cost of the new entrant) that is relevant for ensuring that the incumbent has the right investment incentives. This follows from the assumption that it will be efficient for the new

¹⁹ It does not necessarily follow that if regulated access prices are set above new entrant costs their will be entry. This is because new entrants may not be able to win enough customers from the incumbent in order for their post entry unit costs to be lower than the regulated access price. (That is, if the new entrant has to share the market with the incumbent then both may end up with higher unit costs than the regulated access price.) In addition, the incumbent may have an incentive to prevent bypass by offering lower prices than the regulated cap. However, the incentive for the incumbent to do so is likely muted as doing so results in an immediate reduction in profits while waiting for entry only lowers profits some time down the track. Also, given the impossibility of knowing with certainty whether a new entrant is a real entry threat will tend to make the incumbent reticent to offer lower than regulated prices until entry is at least partially begun (ie, a credible threat has been established).

entrant to invest if its forward-looking costs are lower than the incumbent's forward-looking costs.

Recognising these two roles for the use of forward-looking costs it is important to know which is the relevant scenario under which access prices are being set? Further, if it is assumed that the CCN is truly not a natural monopoly then the question of why there is any need regulate access to the incumbent's CCN must also be addressed? The ACCC's discussion of the build-buy decision in section 5.1.3 of its September 2002 "Future Access Pricing Approaches for PSTN, ULLS and LCS" discussion paper implicitly assumes that the CCN is not a natural monopoly and therefore argues for the adoption of Telstra's forward-looking costs as the appropriate basis for setting access prices (ie, the ACCC's discussion does not consider the possibility that using Telstra's forward looking costs may result in inefficient duplication).

The truth is almost certainly somewhere in between these two extremes of natural monopoly and perfectly competitive supply. If supply of CCN services were a perfectly competitive market then there would be no need for access pricing regulation of the CCN. Rather, supply of CCN services would be provided competitively with any supplier charging above cost losing market share to its competitors. Under such a scenario the CCN infrastructure owners would be subject to the same sort of competitive pressures as the mobile infrastructure owners and only access pricing to the CAN bottleneck would be required.

The extent to which the CCN is a natural monopoly (in general and in particular areas) is a difficult empirical question to which there is no universally accepted answer. With this in mind, there are two potential rationales for regulating access prices to the CCN while still believing that competing investments in the CCN may be efficient:

- CCN services will/may be provided adequately by competitive forces at some point in the future but that in the foreseeable future the CCN is a natural monopoly. Furthermore, by regulating access prices now it is possible to:
 - introduce facilities based competition in downstream services (eg, long distance) without having to wait for the CCN to become competitive; and
 - in so doing this may help overcome some barriers to entry of new entrants into the CCN by providing them with the opportunity to establish themselves in downstream markets first; and/or
- CCN services will only ever be provided adequately by competitive forces for a subset of end user customers and the CCN will remain a natural monopoly for some end user customers.

On the basis that one or both of the above interpretations of the rationale for regulating access prices to the CCN is correct then it follows that there is no simple decision to be made

about the influence of access prices on the build-buy decision. On the one hand, setting prices above new entrant forward-looking costs may well result in inefficient/wasteful duplication and on the other hand setting prices below incumbent forward-looking costs may prevent efficient displacement of the incumbent servicing some areas/customers.

The economic cost of setting access prices at the incumbent's costs and engendering inefficient entry in a natural monopoly industry is equal to:

- the value of any unnecessary investment induced; plus
- the efficiency loss as a result of prices being set above truly forward-looking costs.

The cost of setting access prices at new entrant costs and preventing efficient entry is equal to:

- the difference between the incumbent and the (deterred) new entrant's long run costs; plus
- any costs associated with unfair treatment of the incumbent (to the extent that the incumbent suffers an unavoidable windfall loss as a result of prices being set below its TSLRIC).

If the probability of each type of error is the same, and if issues of fairness are adequately addressed elsewhere, it would appear that setting prices at the new entrant's costs would minimise the potential cost of regulatory error. This is of relevance to consideration of an ADC to the extent that adding an ADC to access prices based on the incumbent's costs (ie, as is currently the case in PSTN O/T access pricing) increases the probability of inefficient bypass – as discussed below.

5.2. Why charge an ADC to influence the build-buy decision?

Having explored this important background it is now possible to explicitly examine the case for charging an ADC in terms of providing efficient incentives for the build-buy decision of new entrants. The first point to note is that an ADC is only justified in terms of sending correct build-buy signals on the assumption that the CCN in that particular area (or for that particular customer) is not a bottleneck facility. This is a simple reflection of the fact that if the CCN is a bottleneck facility then the correct build-buy decision is always to 'buy' – hence there is no disadvantage from having access prices set low as it is never appropriate to encourage duplication.

If the CCN is not considered a bottleneck facility (in some areas or for some customers) the incentives for efficient bypass of Telstra's CCN can be examined by comparing the net revenues associated with serving a customer under the 'build' and under the 'buy' option. If access pricing is to send the correct signals then net revenues should only be higher under

the build option if the new entrant's CCN costs are lower than Telstra's (and vice versa). The argument for including an ADC in Telstra's PSTN O/T charges is that new entrants in the PSTN will have to finance the access deficit associated with any end customers they serve (either through duplicating the existing CAN or by purchasing the ULL service from Telstra). Consequently, if the potential new entrant can avoid financing the access deficit associated with that customer by simply buying PSTN services from Telstra then this will create an artificial disincentive to build PSTN infrastructure to service that customer.

Mathematical Example

Imagine an end user is currently being supplied carrier pre-select services under the 'buy' option (ie, using Telstra's PSTN). However their supplier is considering supplying them under the 'build' option (ie, using its own PSTN (or more accurately its own CCN and the purchase of the ULL service from Telstra in order to connect the entrant's CCN to the end user)). The argument for including the current calculation of the ADC in PSTN O/T access charges is that only then will:

$$\text{Net Rev}_{\text{Build}} - \text{Net Rev}_{\text{Buy}} = \text{Cost CCN}_{\text{Telstra}} - \text{Cost CCN}_{\text{New Entrant}}$$

On the basis that:

$$\text{Net Rev}_{\text{Build}} = R_{\text{CPS}} - \text{Cost}_{\text{CPS}} - \text{Cost CCN}_{\text{Telstra}} - \text{ADC};$$

$$\text{Net Rev}_{\text{Buy}} = R_{\text{CPS}} - \text{Cost}_{\text{CPS}} - \text{Cost CCN}_{\text{New Entrant}} + R_{\text{ULL}} - \text{Cost}_{\text{ULL}}; \text{ and the assumption that}$$

$$\text{ADC} = \text{Cost}_{\text{ULL}} - R_{\text{ULL}}$$

Where each of these terms is defined as:

R_{CPS} = potential new entrants' revenue from carrier pre-select services

$\text{Cost CCN}_{\text{Telstra}}$ = TSLRIC+ per minute²⁰ cost of Telstra's CCN

$\text{Cost CCN}_{\text{Telstra}} + \text{ADC}$ = PSTN O/T regulated access price per minute

$\text{Cost CCN}_{\text{New Entrant}}$ = TSLRIC+ per minute cost of New Entrant's CCN

Cost_{ULL} = TSLRIC+ cost of Telstra's CAN per customer plus cost of additional services provided over ULL (eg broadband)

$R_{\text{ULL}} = R_{\text{ULL}}$ = revenue from sale of additional services over the ULL

Cost_{CPS} = potential new entrant's non PSTN costs in providing carrier pre-select services

²⁰ For simplicity of exposition we assume that there is no call set up costs and that the ADC is levied purely on a per minute basis.

5.3. Problems with charging an ADC

While the above described rationale for using an ADC to signal efficient investment incentives may have intuitive appeal, it is problematic for a number of reasons.

5.3.1. Signalling investment decisions requires use of TSLRIC not TSLRIC+

As currently calculated, estimates of the access deficit and PSTN O/T costs include an allocation of organisational level common costs (ie, TSLRIC+). The allocation of organisational costs to TSLRIC was likely driven by considerations of fairness and the assumption that increasing competition for downstream services would mean that it may be difficult for Telstra to fully recover all its organisational costs from those services.

However, a potential new entrant will base their investment decisions on its TSLRIC not on TSLRIC+ - as it is the marginal impact on costs and revenues that is relevant when considering marginal investment decisions. Consequently, if Optus has to pay an ADC that includes an allocation of Telstra's organisational level costs then it will have an artificially strong incentive to expand its own network to avoid such charges - even if the TSLRIC of its network exceeds the TSLRIC of Telstra's network.

The role out of competing CANs in several Australian CBD areas is possibly an example of the type of inefficient investment decisions that can be driven by access prices set above costs. Were ULL services available earlier at a reasonable cost then it is possible that those CBD areas would have been more efficiently served by greater use of Telstra's existing CAN rather than by rolling out of duplicating networks.

5.3.2. Investment decisions are customer/area specific while the ADC is an average calculation

The ADC paid by an individual customer (or sub set of customers) bears little relationship to the access deficit associated with that customer (or group of customers). This is because the ADC is currently calculated by estimating the total access deficit and allocating this 50% to PSTN calls and 50% to PSTN call minutes. This means that even if the access deficit per customer were identical the ADC paid would be different when a new entrant served a customer using Telstra's PSTN. This is because higher than average volume customers will pay more ADC than lower than average volume customers.

The consequence of this is that the ADC will actually create an artificial incentive for access seekers to expand their network to serve high volume customers - even if they have higher network costs than Telstra. This is because any access deficit the new entrant has to finance in serving that high volume customer will be more than offset by the ADC avoided on PSTN O/T access charges. Similarly, the ADC will not provide sufficient incentive for a new entrant to serve lower than average volume customers, as the ADC avoided will be lower than the access deficit incurred serving the customer directly on the new entrants network.

The extent of this problem will depend on the distribution of customers along the call/time volume continuum. If most customers have average calling patterns then the signalling problems associated with an ADC will be less pronounced. However, if very few customers are 'average' (eg, if most customers are either 'high volume' or 'low volume' with few customers in the middle) then the distortions introduced by an average ADC may be quite pronounced.

The above discussion was carried out on the basis that call/minute volume was the only driver of differences between customer's actual access deficit and the ADC levied on customers' use of the PSTN OT. However, a further material source of difference is the location of that customer. Customers located in areas where the cost of the CAN is low will tend to pay more in ADC than their actual access deficit – even if they have average calling patterns (and vice versa).²¹

The consequence of this is that the ADC creates an artificial incentive for new entrants to role out network in areas where the cost of the CAN is low and in areas where customers tend to have higher calling volumes. Given this incentive one would expect to see new entrants focus CCN network investment primarily on business customers in densely populated areas. This is consistent with the behaviour of new entrants.

Even in the absence of an access deficit (and an ADC) it is possible that access pricing of the CCN can give artificial incentives for investment in low cost network areas. This will tend to be the case if the costs of the CCN are not fully geographically de-averaged in PSTN O/T access charges. Currently access pricing of the PSTN is de-averaged into four bands. However, there will inevitably be some averaging within those bands.

5.3.3. ADC double counts excess profits

Section 4.2 of the ACCC's discussion paper provides evidence that the services Telstra provides over the CAN embody significant economic (excess) profits. The existence of excess profits is likely to be as important a determinant of investment decisions by potential new entrants as differences in CCN costs.

A hypothetical example clarifies this point, what would happen to incentives to invest if the ACCC calculated the access deficit by reference to TSLRIC+ less connection and USO revenues but did not include line rental revenues. Clearly, the ADC would massively increase and the incentive for new entrants to invest in the CCN and associated ULL services would likewise increase – such that new entrants will have an incentive to invest even if they are significantly less efficient than Telstra.

²¹ If the costs of the ULL were averaged in the same way as the ADC is averaged then the ADC would not create a 'geographical' distortion in the incentives to choose between investing in the CCN and buying ULL versus simply buying PSTN O/T (with the ADC included). However, averaging would create a potentially more serious

This is because the access deficit does not include all relevant revenues that the new entrant could expect to earn as a result of entry (ie, line rental revenue in this hypothetical scenario). Precisely the same situation exists currently with the access deficit not including revenues from the sale of natural monopoly services such as, for example, vertical features.

5.3.4. ADC creates incentives for avoidance

The existence of an ADC on PSTN O/T can also create incentives for inefficient avoidance of use of Telstra's PSTN, as noted for the EC by Cullen International SA and Wissenschaftliches Institut für Kommunikationsdienste GmbH:

“In dynamic markets like telecommunications, characterised by rapid technological development and convergence, some types of by-pass of ADC regulations cannot be prevented. ADCs will encourage the use of technologies that do not have to pay ADCs or pay ADCs only on one part of the service, such as can occur when a mix of packet and switched technologies are used in the service. Such an example might be voice over IP networks. The use of very small aperture terminals (VSAT), private networks, call-back and possibly off-peak transmission over cellular and fibre infrastructure owned or leased by mobile operators, all offer examples of ways the rules can be and are avoided.”²²

Similar issues have also been noted recently in the US:

*The current structure of interstate access charges is irrational, and substantial revision of the Commission's access charge rules is needed. At present, the price of access to the local exchange carriers' networks bears very little relation to the way in which the costs of access are actually incurred – per-minute charges for access are far higher than they should be, whereas fixed charges are artificially low. As substitutes for traditional circuit-switched long-distance services, such as packet-switched Internet-based telephony, become more widely available, the regulatory distortions created by the Commission's rules are increasingly untenable.*²³

5.4. Conclusion

For the reasons outlined above, the current ADC is likely to be a poor, and quite possibly counter productive, signal for efficient investment incentives.

distortion in favour of bypassing the ULL in low cost areas by building an alternative CAN. The efficiency costs of duplicating the ULL is likely to be much greater than the efficiency costs of having competing CCN.

²² Study on Universal Service in the Accession Countries, Main Report Annexes to Main Report June 30, 2001 produced for the European Commission under Study contract no 71080 by Cullen International SA and Wissenschaftliches Institut für KommunikationsdCCNste GmbH.

²³ FCC, Access Charge Reform, **CC Docket No. 96-262** Statement of Commissioner Harold Furchtgott-Roth,

6. OVERALL EFFICIENT USE OF THE PSTN

The imposition of an ADC on variable PSTN O/T rates has the effect of increasing the cost of calls above cost and creating an artificial disincentive for retail customers to reduce usage of the PSTN (ie, to make fewer calls). To the extent that demand for calls (and in particular long distance calls) are more price sensitive than connection to the PSTN then using an ADC to finance any 'access deficit' (however defined) will result in a loss in consumer welfare compared to either:

- financing the access deficit through a reduction in any above normal profits Telstra current earns; or
- rebalancing.

Demand for long distance calls is almost certainly significantly more price elastic than demand for connection to the CAN. Estimates of the efficiency cost of imposing taxes on the consumption of long distance services have been estimated as being orders of magnitude higher than other potential sources of financing any access deficit.²⁴ And this is consistent with the Productivity Commission's view (quoted on page 14 of the ACCC's discussion paper) that

"An access price that is "right" in the context of no market power will be too high in the presence of incumbent's downstream market power. This is because if the incumbent earns monopoly profits across the regulated service stemming from its downstream market power, there is an efficiency gain from using these rents to reduce the contribution to fixed costs made by access charges."

NERA believes that this basic conclusion that the ADC imposes significant distortions on the use of long distance services is well understood by all parties to the current debate in Australia. Nonetheless, it is useful to note that precisely this conclusion has driven reform of ADC schemes throughout the world including in:

- the EC (See, for example, Commission Recommendation on Interconnection in a liberalised telecommunications market, 1998); and
- the US (see, for example, the FCC's *Access Charge Reform Order*, 1997).

²⁴ Hausman, J. "Taxation Through Telecommunications Regulation", Tax Policy and the Economy, 1998.

7. SUMMARY

In summary it does not appear that there is a strong case for an access deficit in terms of the first two definitions considered (ie, capacity to finance future investment and fair treatment of sunk costs). It is possible that an access deficit may exist in relation to the signalling of efficient investment by new entrants. However, while this may be true in an 'average' sense, it may well not be true in those areas where potential new entry is most likely. Consequently, the ADC may well create greater distortion of investment incentive than it solves. In addition, the inclusion of an ADC in PSTN O/T access charges distorts the consumption decisions of final consumers.

Given these consideration we consider that it would be a reasonable decision by the ACCC to remove the ADC from PSTN O/T charges.

APPENDIX A. FUTURE EXPENDITURE VS TSLRIC REVENUES

It is commonly argued that if a business does not expect to receive TSLRIC revenues in the long run then, while it may remain in business in the short run, it will exit the business in the longer run. However, this statement is only generally true under specific assumptions – namely that there are no existing sunk assets or that whatever sunk assets there are will require replacement simultaneously at some future date.

By way of example, imagine a production process with 10 machines with undepreciated replacement costs of \$10. Let each machine be dependent on the other machines in the output process (ie, if one machine stops working and is not replaced the other machines are worthless – eg, a production line) and all the machines are sunk (ie, they have no value in any alternative use). Also assume the only ongoing expenditure in the production process is the replacement of the machines when they breakdown. The cost of capital is 10% and the economic life of a new machine is 20 years. The existing machines are of varying ages such that one machine reaches the end of its useful life every 2 years and by 20 years all existing machines must have been replaced.

These assumptions give rise to an annual TSLRIC of the existing service of around \$12 (using competition depreciation). This gives rise to a present value of TSLRIC costs of around \$117 (which is equal to the present value of replacing all assets in year 1 and then doing the same every 20 years in perpetuity). However, given the existence of sunk assets, the expenditure incurred in maintaining the production process indefinitely into the future is \$10 every second year (with a present value of \$58). Furthermore, \$58 is not simply the present value of future expenditure this year it is the present value of expenditure required to maintain the business at any date in the future.

It is clear in this example that if the owners of the business only expect to receive \$6 per annum (or a present value of \$60 in revenues) they will still have an incentive to maintain the production process in the long run – even though \$6 per annum is only around half of the TSLRIC costs of the production process.

This illustrates the point that it is not necessary for a business to expect to receive TSLRIC revenues in the long run in order for that business to maintain its capital base and stay in business. Provided that the business has some sunk assets and that not all sunk assets require replacement simultaneously then investment can be maintained even if expected revenues are substantially less than TSLRIC revenues. As illustrated above this can be true in a competitive market context.