ECONOMIC ISSUES SURROUNDING THE APPROPRIATE ADJUSTMENT OF CPI INDEXATION FOR THE IMPACT OF THE NEW TAX SYSTEM

A Report Prepared by NERA for Australian Pipeline Trust, GPU GasNet, SPI PowerNet and Duke Energy

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Sydney

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National Economic Research Associates
Economic Consultants

Level 6, 50 Bridge Street
Sydney NSW 2000
Australia

Tel: (+61) 2 8272 6500
Fax: (+61) 2 8272 6549
Web: http://www.nera.com

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SUMMARY OF REPORT

In response to the ACCC proposal to reduce the indexation of regulated prices or revenues by an estimate of the full impact of the GST on CPI, this report examines the rationale for CPI indexation and the possible reasons for the ACCC's proposed departure from established practice.

The report concludes that:

- CPI indexation of regulated revenues/prices serves to protect regulated businesses from inflation risk in two distinct ways. Firstly, it acts as a proxy for increases in operating and maintenance costs incurred by the business. Secondly, it is an actual/direct measure of increases in capital related costs incurred by regulated businesses;

- The use of GST exclusive indexation of total regulated revenues/prices (including that portion relating to capital costs) effectively reduces the real value of existing capital assets and departs from the principle of "financial capital maintenance", as well as contributing to regulatory uncertainty and possible regulatory asymmetry;

- The actual adjustments to the CPI proposed by the ACCC are not technically correct even if the imputed bases for the adjustments were accepted as valid;

- Since it appears that the ACCC has not provided a detailed public explanation of why regulated asset owners should **not** be permitted to retain the real value of their capital, it has been necessary to impute the best theoretical case in support of the this position and to examine this case in the light of empirical evidence;

- NERA concludes that economic theory does not provide a robust basis for accepting the case for the ACCC's proposed adjustments to CPI indexation and that the empirical evidence further casts doubt on the validity of the ACCC's approach.

The above conclusions suggest that there are clear grounds for the ACCC to revise its proposed approach to the adjustment of CPI indexation to a basis which reflects the real costs attributable to regulated businesses consequent upon the introduction of the GST.

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1. BACKGROUND

This report has been prepared by NERA on behalf of a number of significant owners of regulated transmission assets. It provides an assessment of the appropriate approach to adjusting CPI indexation for the impact of the Goods and Services Tax (GST) in the context of indexing regulated prices or revenues.

1.1. Meaning of "GST"

The introduction of the GST is widely expected to have a significant impact on the level of prices as measured by the Australian Bureau of Statistics published CPI index. For the purpose of this report the term "GST" refers to the introduction of the Goods and Services Tax on 1 July 2000 and the removal/reduction of a range of other associated taxes phased in over time (as described in the Commonwealth Government's August 1998 policy document "Not A New Tax, A New Tax System" and later amendments).

1.2. Direct Adjustments for the Impact of the GST on Regulated Businesses

Regulated businesses' maximum allowable revenues (MAR) or prices have already been adjusted for the direct impact of the GST on costs during the current regulatory period. This adjustment includes allowance for the additional GST liability to the Australian Tax Office and for an estimate of savings received on operating expenditure as a result of the removal of Wholesale Sales Tax and other tax reductions associated with the GST.

These cost savings were generally estimated for a period of 1 year.

1.3. Impact of the GST on CPI Over Time

There is a range of estimates of the impact of the GST on CPI currently available. These estimates vary depending on the source of the estimate and depending on the time period under examination.

It is widely expected that the impact of the GST on CPI will fall over time as the removal of other taxes on production (such as Wholesale Sales Tax) flow through the economy.

Estimates of the impact of the GST on the change in CPI for the year ended June quarter 2001 include:

- 2.84 percentage points based on Econtech analysis[1];
- 2.5 percentage points based on Commonwealth Treasury's assessment[2]; and
- 2.3 percentage points based on the ABS's qualified analysis.

There are also a number of *long run* estimates of the impact of the GST on CPI including:

- 2.25 percentage points based on the Commonwealth Treasury estimates[3];
- 1.7 percentage points based on Econtech analysis.

1.4. The ACCC's Proposed Approach to CPI Indexation

The Australian Competition and Consumer Commission (ACCC) has proposed to a number of businesses that it will reduce CPI indexation of total revenues on 1 July 2001 by either 2.75 or 2.5 percentage points, the latter being the Commonwealth Treasury's latest estimate of the 12 month impact of the GST on CPI.

1.5. The role of CPI Indexation in Regulatory Regimes

1.5.1. The role of CPI indexation

"CPI minus X" and "incentive regulation" are often used interchangeably to describe regulatory regimes where a business's maximum allowable revenue (or price) path is predetermined to follow a CPI minus X path over a number of years ("the regulatory period").

The rationale for such an approach is that, by setting a predetermined revenue path over a regulatory period, the regulated business has an incentive to reduce costs below that revenue path. This provides for an increase in return on equity to the business as the regulator is, by definition, constrained not to lower the predetermined revenue path to reflect efficiency savings during the regulatory period. These efficiency savings can then be partially or fully passed onto customers in lower allowable revenues in the next regulatory period.

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1 19 February 2001 Econtech report to IPART "Estimating the New Tax System Effect on the Consumer Price Index".

2 See the November Mid Year Economic Fiscal and Economic Outlook

3 See May 2000 Budget Papers.

CPI (minus X) indexation of allowable revenues recognises that regulated businesses do not have control over economy wide cost pressures reflected in the CPI and, therefore, should not be forced to manage this risk over the regulatory period. Indexation to CPI allows the revenue path to be preset for a longer period of time without the risk that economy wide cost pressures (as reflected in the CPI) would increase business costs above those forecast by the regulator at the beginning of the regulatory period (or vice versa).

In theory CPI indexation of revenues is not absolutely necessary to implement incentive regulation. Instead, the regulator could forecast out general inflationary cost pressures on the regulated business over the regulatory period and reflect these in the pre determined price path. However, where general inflationary pressures were different from forecast this would result in unanticipated gains/losses to the regulated business. Potential costs associated with this outcome include:

- prices not reflecting the cost of production over the regulatory period with attendant implications for efficient consumption of the services;

- forcing regulated businesses to manage inflation risk that they are unable to control, potentially thereby increasing the cost of capital and therefore the cost of production; and

- reducing the length of regulatory periods that can be employed without running the risk that costs and revenues will substantially diverge, thereby reducing the potential benefits from incentive regulation; and

- increasing the likelihood of discontent with the regulatory regime by customers and/or governments should it lead to businesses being perceived to have undeservedly high profitability as a result of inflation forecasting errors by the regulator.

In practice it is recognised that the above reasons mean that it is highly desirable for maximum allowable revenues within a regulatory period to be linked to a proxy for the actual inflationary pressures on the regulated business's costs as they apply over the regulatory period. However, in order to ensure that this is consistent with incentive regulation that measurement must be independent of both the actions of the regulated business and the regulator.

It is widely accepted in practice that indexation of revenues to a retail price index (such as CPI) is the best available way of achieving this aim.

Nonetheless, it is possible that CPI may under or overestimate the impact of economy wide cost pressures on the regulated business. This is because the weightings in the CPI basket will not perfectly match the weightings in the cost items incurred by the regulated business. However, an absence of superior proxies for inflationary pressures on costs beyond the control of regulated businesses means that a retail price index such as CPI is [almost] universally used in incentive regulation.

In summary, the use of CPI-X indexation in regulatory regimes is primarily to insulate regulated businesses from the risks of inflation over an extended regulatory period and thereby facilitate the implementation of incentive regulation. While CPI indexation will not be a perfect proxy for the inflationary impact on a regulated business's costs it is the widely recognised as the best available proxy for those inflationary pressures beyond the control of the regulated business.

1.5.2. Appropriate constraints on adjustment of CPI indexation for the impact of the GST implied by good regulatory practice

Where it is anticipated that CPI indexation over a regulatory period will provide an inaccurate estimate of the inflationary pressures on a business's costs then it may be appropriate to make an adjustment for that inaccuracy under an incentive regulation regime. In general, this adjustment will be captured in the "X" factor in CPI-X indexation. However, where this is not the case it may be appropriate to make some further adjustment.

Whether it is appropriate to make such an adjustment will depend on a number of factors, including:

- the certainty and/or materiality of the anticipated inaccuracy. (Where the certainty and/or materiality of an inaccuracy in the CPI are low then it may not be appropriate to introduce further complexity and risk into regulatory regimes by attempting to adjust for these factors.); and

- regulatory precedent and symmetrical treatment of losses and gains. (It may not be appropriate to make an adjustment in one direction if it is not/has not been standard practice to make adjustments in the other direction in similar circumstances.)[4]

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4 For example, given that no positive adjustment was made for the impact of the Commonwealth Government's private health insurance rebate on the CPI, making a negative adjustment for the impact of the GST may be inconsistent with a symmetrical approach to adjusting CPI indexation for the impact of Government taxes/subsidies on the CPI. (The Treasury estimates that the impact of the health insurance rebate was to reduce CPI by 0.6 percentage

However, where there is a high level of certainty that CPI will be a materially inaccurate proxy for inflationary cost pressures facing a business and where it is standard regulatory practice to adjust for such (in either direction) it may be appropriate to adjust CPI indexation.

2. MAINTENANCE OF THE REAL FINANCIAL VALUE OF CAPITAL

NERA supports the principle of the maintenance of the real financial value of capital when indexing the asset values (or revenue equivalents thereof) for regulated businesses. This principle is a reference point for investors in regulated assets, as compared with investment alternatives. If the possibility exists that the regulator will vary the financial value of existing capital then potential investors in regulated businesses will invariably demand a higher risk premium than would otherwise be the case. This means that any purported economic benefits that flow from the regulator assuming such powers must be greater than the economic costs to customers associated with paying higher prices to cover the higher compensating risk premium demanded by investors. NERA considers that, in general, it is unlikely that the benefits will outweigh the costs.

Nonetheless, should regulators propose to adjust asset values in a way that departs from the principle of maintenance of the financial value of capital, NERA supports the adoption of clear procedures with suitable checks and balances. Adherence to these principles would suggest that the regulator only alter the real value of financial capital to the extent that a formal process, with established procedures, for the review of the regulatory asset base exists. In between such established reviews, NERA does not consider that the regulator should act either to reduce or increase the real value of a business's financial capital.

However the ACCC's proposed approach will, in effect, result in a reduction in the real value of financial capital outside any formal review process for determining regulated businesses' real regulatory asset base. NERA understands that it is currently unclear whether, at its next round of price determinations, the ACCC will roll forward businesses' regulatory asset base with a GST inclusive or exclusive CPI. If it adopts the latter approach then the impact could be to reduce the real value of financial capital by around 2.5 percentage points.

points in 1998-99. Regulated businesses suffered a windfall loss as a result of the failure to adjust CPI indexation by this factor.)

This also raises the possibility that the ACCC's proposed approach may effectively reduce the real financial value of capital assets when a formal review could conceivably raise them. This is because the cost of internationally traded equipment and materials (which forms a substantial portion of regulated businesses existing assets) are likely to have risen substantially since those values were previously set due to the dramatic decline in the value of the Australian dollar.

NERA notes that regulatory consistency is another important principle required to improve regulatory certainty. In this regard, we note that indexation of revenues to an unadjusted CPI is consistent with the regulatory approach taken by the ACCC to other government policies that have resulted in a negative CPI spike. In particular, the ACCC did not make a positive adjustment to CPI indexation when the recent private health insurance rebate policy was introduced. That policy was estimated by the Commonwealth Treasury to reduce the CPI by 0.6 percentage points in 1998-99. The approach now being proposed in respect of CPI adjustment potentially reinforces widespread concerns with the opportunities for regulatory asymmetry.

NERA also notes that the maintenance of financial capital was consistent with the interpretation by the ORG of the need to maintain "economic neutrality" when adjusting CPI indexation for SPI PowerNet under the Victorian tariff order.

NERA also understands that reductions in domestic personal income tax rates at around the same time as the GST CPI spike have been put forward as justifications for "clawing back" revenues by indexing to a GST exclusive CPI. In response, we would note that it is standard regulatory practice to set regulated returns to achieve a target post company tax return. Any departure from this principle to regulation on a post income tax basis would involve a significant change in the regulatory environment and should not be countenanced without a significant consultation and analysis. As such, NERA strongly believes that such a justification for the current approach to CPI indexation is inappropriate.

3. THE ACCC'S PROPOSED APPROACH TO CPI ADJUSTMENT

The ACCC proposes to reduce annual CPI indexation for regulated businesses by the Commonwealth Treasury's estimate of the 12 month impact of the GST on CPI. This approach effectively imposes a reduction in the real financial value of existing capital for those businesses. This is because the components of real regulated revenues include both "current" expenditures (operating costs and new capital expenditure) and appropriate returns both on and of the pre-existing capital base – represented by a regulated real rate of return and regulatory depreciation. It can be plausibly argued that the "current" components of revenue, when indexed, should not reflect the GST spike in the CPI, since these costs will receive the benefit of removal of existing business taxes and their replacement by GST, and that the "net " effect of these changes is already reflected in regulated prices from1 July 2000. However, these tax adjustments have no meaning for pre-existing capital returns. Failure to adjust these returns by the full CPI must, by definition, devalue the real financial value of the regulatory capital base.

We have already outlined our concerns with such a departure from the principle of maintenance of the real financial value of capital. However, in this section we draw attention to the fact that the ACCC's proposed approach more than removes the full impact of the GST CPI spike. This is because there are two elements of "double counting" in the ACCC's proposed approach. Thus, even if the ACCC's proposed goal of removing the GST CPI spike from revenues was accepted as reasonable, the ACCC's proposed approach does not do this.

3.1. Double Counting of the GST CPI Spike in Regulated Businesses' WACC

When determining a regulated business's weighted average cost of capital (WACC) an important parameter is the real risk free rate of return. Generally, this is determined by calculating an expected inflation rate from the difference between yields on indexed and unindexed bonds. This expected inflation rate is then used to calculate the real risk free rate. As noted by the ACCC in EAPL's draft decision:

> *"The expected inflation rate is fundamental in deriving real rates of return. An understatement of the expected inflation rate will lead to an overstatement of the real rate of return (and vice versa)."*

However, the above methodology for estimating expected inflation includes the GST CPI spike in expected inflation. This is because financial markets price indexed bonds at a premium to unindexed bonds based on their expectations of published CPI figures. As the published CPI figures include the GST CPI spike then so must the difference in yields prior to the GST's introduction also include expectations of the GST CPI spike.

As a result, regulated businesses' effective real WACCs have already been reduced by the financial market's expected impact of the GST CPI spike on the level of the CPI. Importantly, this is true both for the WACC applied to existing capital and for new capital acquisitions during the regulatory period.

By proposing to index capital costs to a CPI exclusive of the GST CPI spike the ACCC's proposed approach effectively removes the GST CPI spike from capital financing costs twice.

The Office of the Regulator General in Victoria (ORG) has accepted that this reasoning is correct and, in its Electricity Distribution Price Determination 2001-05, the ORG adjusted up the allowed WACC by 27 basis points. This adjustment was based on an estimate of the impact of the GST CPI spike on real yields at August 2000. As the ORG explained:

> *"the Office has stated that it will use an inflation rate that has been adjusted to remove the impact of the GST spike for the purpose of escalating tariffs. The anticipated inflation spike due to GST would have caused a reduction in the prevailing yield on indexed-linked bonds compared to the level that otherwise would have occurred. The Office has accepted that a consistent treatment of the GST spike would suggest that observed yields on index linked bonds should be adjusted for this reduction"*[5]

The Office's estimate of the GST spike was based on the Commonwealth Treasury's *long run* annual estimates to September 2002 that result in a cumulative GST spike over that period of 2.25%. The Office also noted that its calculation of the impact of the GST spike was consistent with the methodology provided by Westpac and UBS Warburg. NERA also supports the use of that methodology.

To the extent that regulated businesses WACC's were set earlier than August 2000 it is appropriate that this 27 basis point adjustment be discounted to reflect the fact that the GST CPI spike would have had a discounted impact on financial market returns at that time.

On the other hand, the biased WACC estimate will also already have applied from the beginning of the determination. As such, it is not enough to reduce any adjustment to CPI indexation of capital financing costs by the discounted value of 27 basis points. Rather, this must be scaled up by a factor to reflect the fact that regulated businesses have already suffered a lower WACC for "n" years. For a 5 year regulatory period this factor would be approximated by 1+n/5.

Adjusting the regulated WACC for the GST spike would thus ensure that regulated businesses do not have the GST CPI spike removed from regulated revenues more than once over the regulatory period.

3.1.1. Conclusion

In summary, allowing for the above error (and abstracting from all other arguments advanced in this report against adjustment of CPI indexation of capital returns for GST) would require the ACCC to reduce its proposed adjustment of that component of revenues

[5] Office of the Regulator-General, Electricity Distribution Price Determination 2001-05: Volume II p 124

that relate to capital financing costs by a *minimum* of the discounted value of 0.27 percentage points scaled up by a factor of 1+n/5.

3.2. Double Counting of the GST's Long Run Impact on the CPI

It is generally accepted, including by the ACCC, that the impact of the GST on CPI will initially be positive and will then be negative (from a higher base).

Regulated businesses' maximum allowable revenues (MAR) or prices were adjusted for the direct impact of the GST on costs during the current regulatory period. This adjustment included allowance for the additional GST liability to the Australian Tax Office and for an estimate of savings received on operating expenditure and short term capital expenditure as a result of the removal of Wholesale Sales Tax and other tax reductions associated with the GST.

These cost savings were generally estimated for a period of one year. Arguably it would be consistent for indexation of these costs to be adjusted for the one year impact of the GST on CPI[6]. Essentially, this approach assumes that operating cost savings flowing to the regulated business after the first year of the GST will be adequately reflected in lower than otherwise CPI growth due to economy wide costs savings.

That is, applying an adjustment of CPI indexation to operating and maintenance costs for the one year impact of the GST on CPI effectively assumes that the longer term cost savings to the business are in proportion to average economy wide longer term cost savings. If this assumption holds then there will be no net increase or decrease in businesses' net dollar margins as a result of the GST.

However, this argument does not apply for the adjustment of CPI indexation in so far as it relates to pre-existing capital costs. This is because net dollar margins are equivalent to returns on and of existing capital. (The ACCC defines nominal dollar margins as "the price

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6 In this report, NERA has taken the conservative position that the GST CPI spike will not be reflected in higher wage and material costs. This is arguably not the case as it is not clear that the GST CPI spike would not be reflected in higher wage and material costs to regulated businesses. NERA notes that the Australian Council of Trade Unions is currently arguing in the 2001 Living Wage Case, before the Australian Industrial Relations Commission, that wage increases are needed to compensate low income earners for the impact of the GST on CPI. Similarly, the Reserve Bank of Australia has also publicly argued that "an important uncertainty in the wages outlook at present is the potential impact of GST-related clauses in wage agreements" (May 2000 RBA Bulletin). To the extent that wages/material costs did increase contemporaneously with the GST CPI spike then it may be appropriate to recognise this with at least partial indexation to the GST CPI spike.

of a good or service less cost of goods sold/services supplied, operating costs and selling costs". In regulatory terms this equates to the return on and of capital.[7])

As a result, if the return on and of existing capital does not rise by the full GST exclusive CPI then, by definition, regulated businesses will suffer a fall in their net dollar margins as a result of the GST. To see this, note that under the ACCC's proposed approach regulated businesses revenue will rise by the GST inclusive CPI less 2.5 (or 2.75) percent. However, the long run impact of the GST on CPI is estimated to be 2.25 percent. This means that regulated businesses will suffer a long run fall in net dollar margins of either 0.25 or 0.5 percent (2.25 less 2.5/2.75 percent).

Effectively, regulated businesses will have their nominal revenues reduced twice for the impact of the GST. Firstly, by the 2.5/2.75 percentage point adjustment to indexation and then subsequently by indexation to the GST inclusive CPI which grows by 0.25 percentage points less than it would have in the absence of the GST.

NERA also notes that if the Econtech estimates of the long run impact of the GST on CPI are accurate regulated businesses will suffer a 0.8 or 1.05 percent reduction in net dollar margins (owing to a 1.7 percent estimated long run impact of the GST on CPI).

3.2.1. Conclusions

To remove double counting of the GST CPI spike (and abstracting from all other arguments advanced in this report against any adjustment for GST in CPI indexation of capital returns) the ACCC would need to adjust the indexation of that component of revenues that relates to existing capital costs by a *maximum* of 2.25 percentage points.

[7] Source, ACCC March 2000 Price Exploitation Guidelines.

4. BEST CASE JUSTIFICATION FOR ACCC'S PROPOSED APPROACH

The ACCC's proposed adjustment to CPI indexation will result in a fall in the real value of regulated financial capital of around 2.5/2.75 percent. To the best of NERA's knowledge, however, the ACCC has not provided a detailed explanation as to why regulated owners of capital should not be allowed to retain the real value of their capital. Since the basis of the ACCC's proposed approach has not been made clear, in this section we critically examine what we believe to be the best possible theoretical justification for the ACCC's proposed approach in terms of both economic theory and empirical data.

In particular, we:

- set out the most plausible reasons which may support the ACCC's proposed approach;
- analyse the extent to which those reasons actually apply in the current situation; and
- examine the empirical evidence in support of the ACCC's proposed approach.

On both theoretical and empirical grounds we find that the best possible justification for the ACCC's proposed approach does not establish an adequate basis for application of that approach to the current situation.

4.1. Theoretical Justification for the ACCC's Proposed Approach

In this section we examine whether there is any economic rationale to suggest that the real value of all capital assets in the Australian economy will fall by around 2.5 percent as a result of the GST CPI spike.

If this was the case, it might be possible to argue that investors in regulated businesses would have suffered a real loss in financial capital due to the GST CPI spike had they invested elsewhere (at similar risk). That is, removing the GST CPI spike from indexation of regulated businesses' revenue could be seen as simply reflecting variations in the real value of capital throughout the economy.

NERA considers the most plausible case for this view relies on each of the following four major assumptions:

i Australia is a small economy and the supply of international financial capital to Australia is perfectly elastic at the "going" world interest rates. That is, nominal domestic rates of return on financial capital are determined by the international risk free rate plus expected depreciation in the Australian dollar plus an appropriate risk premium for the type of investment made.

ii Each of these variables (ie the international risk-free rate, expected exchange rate depreciation and risk premium) is independent of the GST CPI spike.

iii Competition and a perfectly elastic supply of capital relative to the size of the market mean that the threat of entry ensures that owners of domestic capital can only achieve the above-determined rate of return on the nominal **replacement** cost of existing assets.

iv The nominal replacement cost of existing (unregulated) assets did not rise with the GST CPI spike.

If each of these assumptions hold then it follows logically that the value of nominal returns on existing capital assets would not rise with the GST CPI spike. As a result, the real financial value of those assets would fall by the GST CPI spike.

4.1.1. Applicability of the "Most Plausible Reasons" for the ACCC approach to the Actual Events

There are several reasons to believe that the above major assumptions will not hold true for unregulated businesses. This is particularly true over the remainder of the current regulatory period.

As already described, the GST CPI spike is, by definition, a real cost to all net owners of capital. These owners had an incentive to avoid absorbing this cost by one of two means.

i to consume out of capital prior to the occurrence of the GST CPI spike; and / or

ii to pass the cost on in higher charges for the use of their capital (eg, higher prices for goods / services produced with that capital).

In the above-suggested theoretical justification for the ACCC's proposed approach, both of these attempts to maintain the real financial value of capital would be thwarted by a perfectly elastic supply of capital relative to the size of the market and the threat of competitive entry in the short run. However, it is arguable that these assumptions do not accurately reflect the circumstances of the Australian economy. The following sections analyse the applicability of these assumptions.

4.1.1.1. Elasticity of the supply of physical capital relative to the size of the market

Given that the GST CPI spike represents a real cost to the owners of Australian capital it seems reasonable to argue that an attempt will be made to pass this cost on to consumers in the form of higher prices. In effect, the GST CPI spike can be viewed as analogous to a tax on existing assets at 1 July 2000. It appears reasonable to assume that, in the hypothetical case where the Government imposed a tax on the value of existing assets, then the owners of those assets would attempt to pass this tax on in the form of higher prices.

It is important to note that maintaining the real financial value of capital **does not** lead to a permanently higher price level. Rather, prices would initially rise and would then fall as existing capital was replaced with new capital purchased at a lower real cost. The medium to long-term impact of maintenance of real financial value of capital on price levels is zero.

A necessary condition for an attempt to maintain the real value of financial capital to be unsuccessful is that the supply of capital available for potential competitive entry must be perfectly elastic relative to the size of the existing capital stock in the short run.

This may hold true for any given industry within the economy, as its size will, in general, be small relative to the size of available capital for investment. However, the supply of capital is certainly not perfectly elastic relative to the size of the entire Australian economy, either in the short or medium term. To argue that perfectly elastic supply of capital to all domestic industries individually implies perfectly elastic supply to all domestic industries in aggregate involves a fallacy of composition.

Put simply, if every business in the Australian economy attempted to maintain the real financial value of its capital through higher prices then there must be sufficient capital inflow from the rest of the world (or from higher domestic savings rates) for competitive entry to occur in all industries in order to prevent these price rises occurring.

It is simply not feasible that the Australian economy could finance such an increase in domestic investment at anything like current rates of return. It follows that, to the extent that all owners of domestic capital attempt to pass through the GST CPI spike, then competitive entry is unlikely to restrict their capacity to do so in the short to medium term. In this circumstance, it is more likely that prices would rise to reflect the cost of the GST CPI spike on existing capital and then fall over time as existing capital assets are replaced.

4.1.1.2. *Independence of the domestic risk free rate (and risk premiums) from the GST CPI spike*

All other things constant, in order for the domestic risk free rate of return to remain constant in the face of the GST CPI spike it is necessary that any consumption out of financial capital prior to the GST CPI spike is replaced by an inflow of financial capital from international sources.

The supply of international financial capital to Australia is generally not regarded as perfectly elastic relative to the size of Australian capital markets. Indeed, it is a common view amongst both financial market participants, the Reserve Bank of Australia and the Commonwealth Treasury that higher levels of net international capital inflow (ie, higher current account deficits) can only be "bought" at the cost of higher domestic interest rates. Similarly, a number of academic studies of empirical data suggest that there is evidence that uncovered interest parity (ie, perfect international financial market integration) does not hold true[8].

It is therefore questionable whether the domestic risk free rate would be independent of the GST CPI spike.

Furthermore, it is not obvious that all other things would remain constant in the face of the GST CPI spike. The large relative and aggregate price movements associated with the GST CPI spike may well have induced higher risk premiums being associated with holding domestic assets including domestic dollars. To the extent that this is the case then the GST CPI spike may have resulted in the need for higher nominal returns on Australian assets simply in order to maintain the same level of net capital inflow. To the extent that increased capital inflow was required to replace reduced domestic savings the GST CPI spike may have caused even higher domestic returns.

The fact that the Australian dollar has fallen over 10 percent against the Trade Weighted Index since the GST was introduced[9] would suggest that any international investor who had demanded a higher risk premium for Australian assets would, in an ex post sense, have been proved right.

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8 See, for example, Throop, A.W., "International Financial Integration and linkages of National Interest Rates", *Federal Reserve bank of San Francisco Economic Review*; 0(3), 1994, pages 3-18.

9 Reserve Bank Of Australia website "www.rba.gov.au"

4.1.1.3. The existence of perfectly competitive entry conditions in the short to medium term

The analysis in the previous two sections suggests that even if competitive entry were possible in the short term it may not prevent the pass through of the GST CPI spike in higher prices. However, it is also seems reasonable to argue that competitive entry is unlikely to take place in the short to medium term due to the existence of barriers to entry.

This will be the case where there are significant short-term barriers to entry. Barriers to entry exist in the form of "sunk" physical and non-physical capital. An investment is "sunk" if the owner cannot expect to recoup the cost of the investment should competitive entry be unsuccessful.

Almost all industries exhibit some barriers to entry. At one extreme, the net resale value of office furniture (after costs) is inevitably lower than its purchase and installation costs. As a result, a portion of investments in office furniture is sunk. An investment in developing a new consumer brand is at the other extreme. If entry is not successful then, by definition, this investment will be unable to be recouped. Furthermore, a significant proportion of the cost of planning and organising entry into a new market place[10] is likely to be "sunk".

It is also important to note (as explained above) that the maintenance of financial capital will have no medium to long-term impact on prices. As a result, by the time short-term barriers to entry in the unregulated market could be overcome the GST CPI spike may no longer be reflected in higher market prices and the return on replacement costs may be back at equilibrium levels (assuming it ever rose above these[11]). This would further reduce the attractiveness of entry as any "super normal" profits, measured on a replacement cost basis, may be gone before the entrant could benefit from them.

4.1.2. Summary

Economic theory does not provide an unequivocal basis for determining to what extent unregulated businesses would have been able to maintain their real financial capital in the face of the GST CPI spike.

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10 For example, developing relationships/contracts with suppliers and customers.

11 This is assuming it ever rose above equilibrium levels in the first place. As already discussed above, there are good reasons to believe that financial market rates of return would have risen with the GST CPI spike and that, therefore, maintaining the real value of financial capital would not have created any "super normal" rates of return.

Nevertheless, it can be said that it would not have been possible for unregulated businesses to maintain the real financial value of capital if:

- the GST CPI spike did not positively impact on the domestic risk free rate and other yields;
- the supply of international capital is perfectly elastic relative to the size of the Australian economy at the going rate; and
- barriers to entry in the unregulated sector of the Australian economy are zero in the short term.

We believe that it is reasonable to argue that not all of these conditions hold and therefore it is reasonable to consider that unregulated businesses would have been able to maintain most if not all of the real financial value of their capital in the face of the GST CPI spike.

4.2. Empirical Evidence of a Fall in the Real Value of Capital Assets

Given that economic theory does not establish an unequivocal basis for assessing the extent to which unregulated businesses may have been able to maintain the real value of their financial capital, and given that the ACCC's approach would appear to rely heavily on the best case derivable from this theory, it is important to examine the empirical evidence on this issue.

4.2.1. Observable impact of the GST CPI spike on bond yields

Observing nominal bond yields could in theory tell us what actually happened to the cost of capital as a result of the GST CPI spike. Unfortunately, it is difficult to disentangle movements in nominal (unindexed) yields that may be due to the GST CPI spike from other factors such as other changes in inflationary expectations and general macroeconomic conditions - especially where it is difficult to determine a single date on which the market would have factored in the impact of the GST CPI spike.

However, the existence of observable yields on indexed bonds combined with the existence of certain key dates on which the probability of the GST being introduced materially changed does allow these difficulties to be ameliorated.

By definition, expected nominal cash flows on indexed bonds always rise by the *full-expected increase in the CPI*. Furthermore, financial markets will always set the price of these bonds equal to the discounted value of that cash flow – where the discount rate applied is slightly below the nominal yield available on an unindexed bond of similar risk and maturity.[12] This condition is required to remove permanent arbitrage profits that would otherwise be available from switching from unindexed to indexed bonds or vice versa.

It follows that if nominal yields on unindexed bonds did not rise with the impact of the GST on CPI then the price/real yield of indexed bonds must have risen/fallen by the full impact of the GST on CPI[13]. Essentially, the nominal cash flow on indexed bonds is known with certainty to increase by the full GST CPI spike, therefore, unless the nominal cost of capital (discount rate) also rises to reflect the GST CPI spike then the price of indexed bonds will rise by the same percentage as the nominal cash flow.

However, if the GST CPI spike increases nominal yields (on unindexed bonds) then there will be no impact on the price/yield of indexed bonds as the nominal discount rate will rise in line with the nominal cash flow on indexed bonds.

The impact of the GST CPI spike on indexed bond prices and yields for each scenario are summarised in the below table.

Table 1
Impact of the GST CPI Spike on Indexed Bond Prices (all other factors remaining constant)

Scenario	Impact on indexed bond prices/real yields
1. GST CPI spike *does not* result in an increase in nominal capital costs	Rise/fall by the expected impact of the GST on the value of CPI indexed revenues
2. GST CPI spike is fully reflected in an increase in nominal capital costs	None

12 A slightly lower discount rate is likely to be applied as indexed bonds are less risky than unindexed bonds as they, by definition, remove inflation risk.

13 This must be measured in NPV terms. That is, if financial markets factored in the full impact of the GST on CPI at a particular point in time then the willingness to pay more for indexed bonds would increase by the NPV of the additional future nominal cashflow on those bonds at that point in time. This would clearly be larger the closer to 1 July 2000.

4.2.2. Dates when yields may have been affected

If the market factored in the impact of the GST on the CPI at a single point in time then, in theory, it would be possible simply to examine indexed bond price / yield movements at that time in order to determine whether the market was factoring in an increased nominal capital cost or not. However, it is more likely that the market's expectations were factored in over time and that that, at any given time, they reflected the likelihood that the GST would actually come to fruition.

Nonetheless, while it is true that market participants may have factored in the impact of the GST CPI spike over time, there is at least one key date on which market participants would have received significant information on which to improve their estimates of the likelihood of the GST CPI spike coming to fruition. Specifically, 3 October 1998, being the date of the last federal election. The probability of the GST being introduced rose substantially following the Government's re-election on that date[14].

There are other potentially important dates where the probability of the GST being introduced may have been materially affected. Unfortunately, in each of these cases it is not possible to categorically say in what direction the market's probabilistic estimate of the impact of the GST on CPI would have moved. The most obvious dates are, in chronological order:

- 13 August 1997 when the Government first announced that it was examining the merits of a "broadly based consumption tax";
- August 1998 when the Government first released the details of the GST package (including an estimate of the GST CPI spike); and
- 28 May 1999 – the date the Government announced that it had secured Democrat support for its passage through the Senate.

As already stated, each of these dates is unsatisfactory for the purpose at hand of attempting to observe the impact of the GST CPI spike on real yields.

[14] During the election campaign Opposition and Government policy on the GST were diametrically opposed and expectations were for a close election result - as was borne out by the actual result. The Government was returned with a majority of just 6 seats and a minority of the two party preferred vote.

- Firstly, on 13 August 1997 the Government did not indicate at what rate the proposed GST would be introduced nor what indirect taxes it would replace. Thus, it is not obvious what (positive or negative) GST CPI spike it would have expected.

- Secondly, this uncertainty also means it is not possible a priori to know whether the Government's announced policy in August 1998 increased or decreased the market's expectations of the GST CPI spike.

- Thirdly, prior to the May 1999 announcement the Government had been openly negotiating with Senator Brian Harradine on the passage of the GST legislation. Thus it is not possible to know to what extent the market had already factored in passage of the legislation prior to the announced agreement with the Democrats. Furthermore, while the agreement with the Democrats may have increased the probability of the GST being introduced it may also have reduced the expected magnitude of the GST CPI spike owing to the fact that fresh food and other items were to be "zero rated".

This suggests that only during October 1998 is it possible to say that there would have been a significant increase in financial market's (probabilistic) expectations of a GST CPI spike. It is therefore instructive to examine what happened to indexed bond prices and yields in that month.

4.2.3. Yield movements and the 1998 election

The following table sets out the movements in 10 year plus indexed bond prices and yields in October 1998.

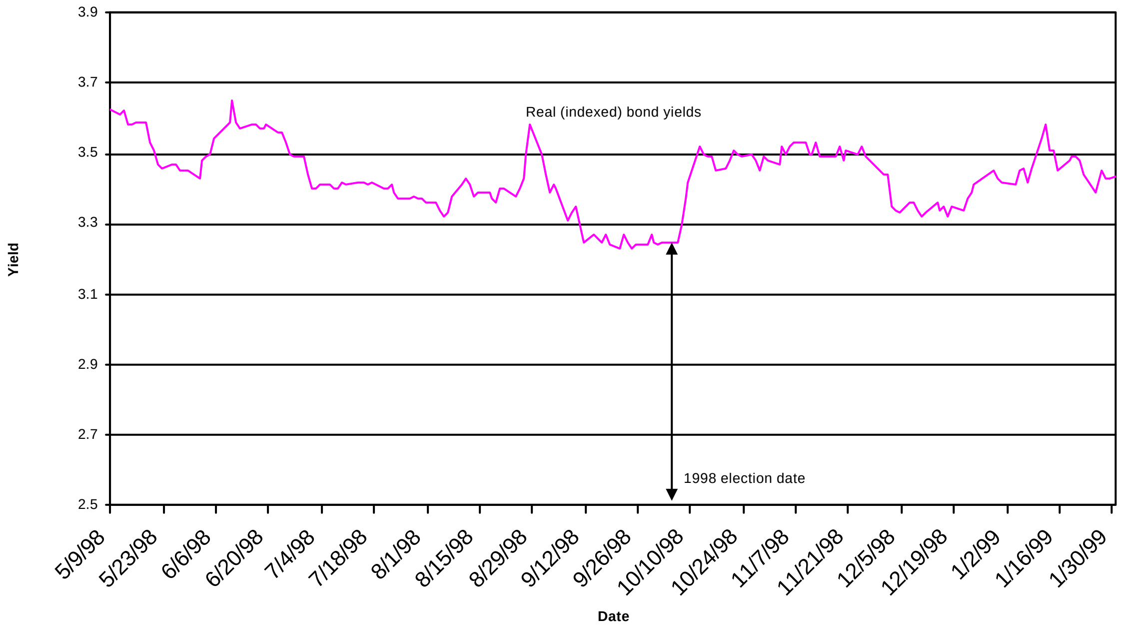
Table 2
Movements in indexed bond prices and yields[15]

	Δ Prices	Δ Real Yields
Month of October 1998	-6.6%	+0.23 basis points (7.1 percent)

15 10 years for unindexed bonds and the average of the longest dated maturity for indexed bonds available. See table F02 RBA Bulletin.

The dramatic rise in real yields following the October election can be seen from the following graphic that plots real yield movements in the 12 months surrounding the 1998 election. Furthermore, in the seven working days following the election real bond yields rose by 25 basis points. Without any further analysis the above data clearly provides support to the view that scenario 2 rather than scenario 1 held true. This is because, rather than falling as predicted by scenario 1, real yields actually rose.

Graph 1
Real and Nominal Yield Movements Around the 1998 Election



However, it is possible that the underlying growth in real yields (for non GST reasons) in October was large enough to 'cancel out' the GST CPI affect and to add the observed 23 basis point increase. While this is possible, the increase in real observed yields in October is already one of the largest in recorded history[16]. Under scenario 1 the impact of the GST CPI spike on real yields could have been around negative 27 basis points[17]. Thus, underlying increases in real yields during October may have had to be of the order of 50 basis points in order for the observed data to be consistent with the view that scenario 1 held true. This would have been the second largest monthly percentage increase in history and would have occurred in a month where there was no change to monetary policy settings.

16 Since July 1986 when monthly data is first reported only 9 months (or 8 percent of months) report larger increases in real yields than in October 1988.

17 This is the ORG's estimate of the impact of the GST CPI spike on the net present value of inflationary expectations in August 2000.

Applying the principle of Occam's razor[18] then it would appear that the available data provides reasonable support for the view that scenario 2 holds. That is, that the GST CPI spike did not reduce real yields on indexed bonds.

5. SUMMARY AND CONCLUSIONS

We have argued that the ACCC's proposed approach to adjustment of CPI indexation will more than remove the impact of the GST CPI spike on regulated revenues/prices.

In any event, NERA considers that full removal of the GST CPI spike would be an inappropriate regulatory response in so far as it reduces the real returns to existing capital. This action would be inconsistent with the principle of the maintenance of the real financial value of capital.

Nonetheless, NERA is aware that if it could be demonstrated that unregulated businesses were unable to maintain the real value of financial capital then it may be argued that regulated businesses should likewise be prevented from doing so. Without accepting the validity of this argument, we have examined whether unregulated businesses did (or would have been able to) maintain the real value of financial capital for existing assets.

We conclude that theory suggests that unregulated businesses could have maintained the real value of their capital. Furthermore, the available empirical data supports the view that it is unlikely that unregulated businesses would have suffered a fall in the financial value of their capital purely as a result of the GST CPI spike.

18 That is, accepting the simplest hypothesis if it provides a better or equal explanation of available data.