FINAL REPORT

Critique of ACG Report on Tobin's q

Submission to the Productivity Commission's Review of the Gas Access Regime

MAY 2004

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FINAL REPORT

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Executive Summary

As part of its submission to the Productivity Commission's Review of the Gas Access Regime, BHP Billiton commissioned the Allen Consulting Group (ACG) to prepare a report that, amongst other things, assessed whether regulators have set prices that are too low to support new investment. ACG concluded that:

> regulators systematically err in favour of providing regulated entities with a return that exceeds the cost of capital associated with the regulated activities.

ACG reached this conclusion by comparing the market value of regulated businesses in Australia (adjusted for the value of its retail customer base) and their regulatory asset bases. For most of the businesses analysed, ACG base its estimates of market values on the sale price at either the time the assets were privatised or when they were subject to a subsequent trade sale. In the few cases where the company is listed, market values are based on the share price.

This report reviews the ACG analysis and argues that considerable caution is required in interpreting the ACG results. Not only are the estimates subject to very wide error bands because of the numerous heroic assumptions needed for measurement, but also there are strong reasons to believe that the assumptions made introduce significant biases in the estimates. This report concludes that there is no basis to support ACG's central contention that regulated rates of return are more than sufficient to support new investment.

Limitations of ACG's methodology

The ACG report ignored the simple commercial reality that there is every reason for the sale price of, say, a privatised asset to exceed its regulatory value. *The sale price will reflect the investor's expected value of the business operating under new ownership.* The ACG report therefore ignores the fact that:

- the sale would not have occurred had it not been for the fact that the new owners (believe they) have skills or access to opportunities that will make the asset more valuable in their hands than in the hands of the previous owners;
- the new owner's bid will have been driven by its *expectations* as to the future free cash flows that can be generated by the business and that business's risk profile. Whilst these expectations will vary amongst investors, especially in an uncertain environment, the successful bid will generally be underpinned by the most optimistic expectations, a result which is sometimes referred to as the "winner's curse".

Accordingly, it should be expected that in the face of uncertainty, rational buyers will adopt a range of expectations as to the future revenue earning capacity from any asset, including assets subject to uncertain future regulatory outcomes. The significant reductions in the prices of regulated businesses when they have been resold highlights the fact that the early privatisation processes were likely to have been influenced by very bullish assumptions being adopted by bidders.

Moreover, ACG's approach simply assumes that the calculated q ratios (necessarily a valuation reflecting the "average q value" for past investment) directly translate into the anticipated q value to encourage new investment, which is so critical to ACG's conclusions. However, the average and marginal q values for a given firm can and generally will differ – a point well understood in the economics literature.

The combination of reliance on valuations at the point of sale and the use of average rather than marginal q ratios provide strong *prima facie* reasons to expect the ACG's estimates to provide *biased* results. The effect is compounded by the fact that the ACG analysis does not consider the factors that influenced the prices paid for assets, nor does it consider the relevance of these factors to motivating new investment.

Factors omitted from ACG's analysis

In practice, several factors exerted a material influence on the values ascribed to regulated businesses by buyers. The principal factors included:

- favourable tariff rulings, as well as expectations that favourable regulatory conditions would continue to prevail. At the time of the initial privatisations, bidders' valuations of the businesses were naturally heavily influenced by the revenues that could be earned from the regulated assets. Often the sales were undertaken against the backdrop of a Tariff Order which set an initial price path (including, where appropriate, retail prices for non-contestable customers) for a defined period after which prices would be reset by the regulator. History has shown that these Tariff Orders or retail price paths included a substantial price premium. The extent to which their bids were increased on account of these premia will have depended upon each bidder's expectations of future outcomes of regulatory processes;
- tax arrangements – one of the key competitive dimensions in the privatisation processes undertaken to date is the extent to which bidders can adopt tax efficient structures. Other things being the same, the more efficient the tax structure, the higher the bid that a purchaser would be prepared to submit, and the greater the chance of that bid being successful. The scope for the exploitation of tax efficient structures was particularly prevalent in the rules that prevailed for the early privatisation processes. Yet in its analysis, ACG makes no mention of the tax positions of the businesses at

their time of sale or any allowance for their impact in calculating q ratios. Properly incorporating the value accretive impact of tax positions adopted by successful bidders would reduce ACG's q ratios;

- unregulated activities and assets. In addition to the impact of retail activities, bidders' valuations would have been influenced by:
  - the opportunity to derive additional unregulated revenues from their regulated assets (such as constructing an optic fibre network, raising the height of stobie poles for mounting mobile phone stations or deriving revenue from the rental of pole and duct space to facilitate the roll out of fibre optic cable). The regulatory treatment of the revenue derived from the use of regulated infrastructure in unregulated activities has been to allow such revenues to be retained (or at least the bulk of such revenues to be retained); and
  - enhancing existing unregulated operations (such as GasNet's significant gas metering and project operations which were ignored in the ACG analysis) and establishing new unregulated operations (where the brand associated with the new regulated business would provide new commercial opportunities for the owner adopted by virtue of the established customer relations and the very high penetration levels of the services that were provided);
- out-performance of X factors - potential purchasers would have valued the opportunity to retain a substantial proportion of the benefits from establishing more efficient operations of the businesses and the potential for scale and scope efficiencies in any subsequent mergers or acquisitions;
- asset productivity - the most common form of price control under the Tariff Orders were price caps. As a consequence, valuations were very sensitive to the demand forecasts of the respective bidders - for example, if the profit margin is assessed to be 10 per cent on sales, then an increase in forecast sales of only 10 per cent will double profitability expectations for the period that those benefits are retained;
- expectations of benefits in future regulatory reviews – in many cases, bidders may have had expectations that they would have a strong case to argue for more favourable rulings in respect of some of the provisions in the original Tariff Orders – including for example, the valuation of easements for electricity distribution networks;
- strategic values, including, for example, the perceived strategic fit of the available businesses within the broader operations of the firm. Such strategic values may have included factors such as geographic or industry sector diversification or changing the mix of growth versus yield assets.

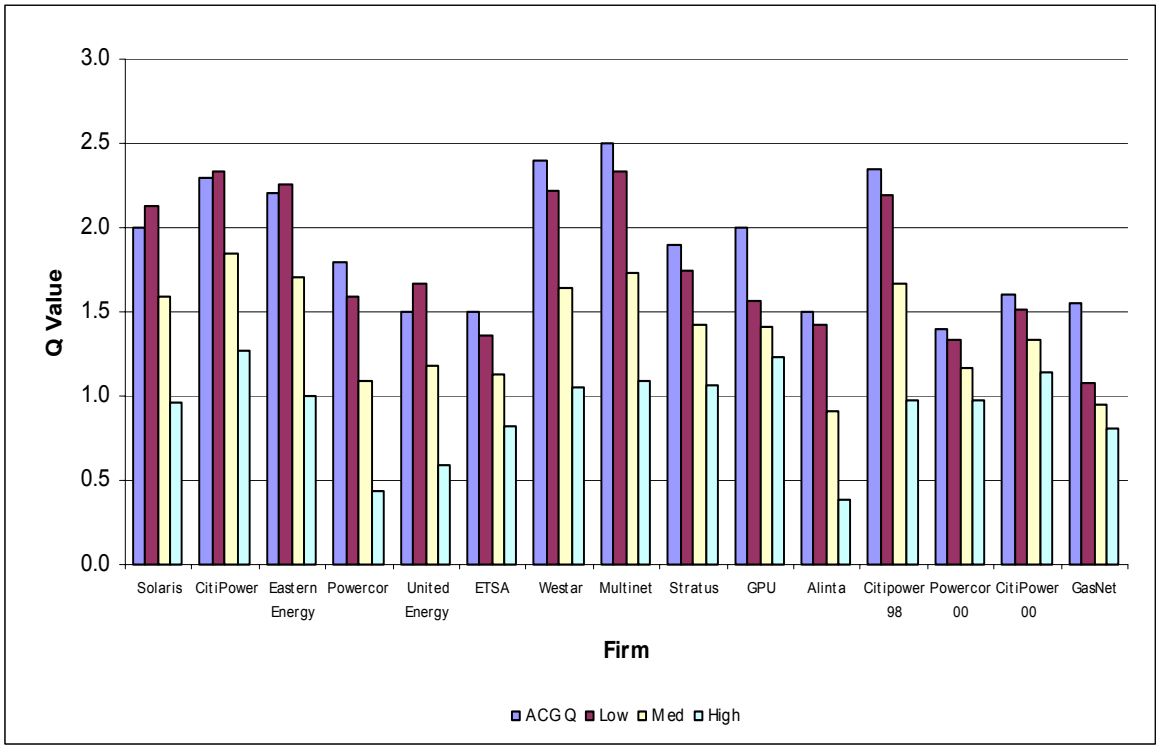
These factors could easily exert a substantial influence on the average q whilst having little if any impact on the marginal q ratio. Yet, there was minimal discussion of these

matters in the ACG report which, instead, relied on an untested assumption that the average q would equal the marginal q.

When account is taken of these factors, and adjustments are made for reasonable estimates of their likely impact on bids, two messages emerge:

- a very wide range of values may be assigned to the regulated business by bidders, reflecting in turn, a wide range of q values; and
- ACG's assertion that regulators were providing a rate of return to the relevant entities that exceeds the cost of capital cannot be substantiated. In particular, by attempting to quantify *just some* of the biases in the ACG methodology that have been discussed in earlier sections, it becomes evident that q ratios close to 1 become the norm. This is illustrated in the following chart which presents 'high', 'medium' and 'low' estimates for q ratios where adjustments have been made to take into the impact of some of the factors listed above..

Sensitivity of measured q ratios



Source: ACG and NECG estimates

Implications for the marginal q factor for new investment

The factors outlined in the previous section will tend to exert a significantly greater influence on existing assets than for prospective investment. For example, the impact of

favourable tariff rulings and tax positions are influential in the valuation of existing assets but will have very little if any impact on making new regulated infrastructure more attractive to investors.

Furthermore, the other factors considered exert far more influence on the average q than the marginal q. For example, there is obviously more scope for operational efficiencies to be extracted from an existing stock of assets than for new assets. Similarly, there are fewer opportunities to earn additional revenue from incremental investment in an existing network relative to the network as a whole.

Moreover, incentives for new investment will be more sensitive to the impact of regulatory uncertainty. The Productivity Commission has already commented on the incompatibility of the current regulatory environment to accommodate the uncertainties facing risky new investment.

Accordingly, even if the average q for existing infrastructure investments is more than one (a view that cannot be sustained based on the ACG report given the problems that have been identified), it is clear that this will translate into a significantly lower marginal q, especially given the impact of uncertainty on new investment in a regulatory environment.

Other concerns with the ACG report

There are other reasons to be cautious in the interpretation of the ACG results including:

- selection bias – the sample adopted in the ACG report represented a subset of the outcomes of sale processes since 1995. Many of the omitted sales candidates exhibited lower q values than those relied upon in the main ACG sample. The omitted firms include AlintaGas (whose q values of between 0.8 and 1.0 are inflated on account of the failure to adjust for the value of its LPG contract with Wesfarmers) and the entities involved in the most disputed regulatory decisions in Australia, such as Epic Energy and the Australian Pipeline Trust;
- the fact that companies listed on the ASX exhibit, on average, ratios of market values to accounting values significantly greater than 1 – indeed, greater than 1.5 – for much of the period under consideration. (Of course, the accounting values for listed companies are calculated on a different basis to regulatory values, but this does highlight the uncertainties involved. Also, note that the combined effect of the listing rules and AASB 1041 over the period under consideration required that accounting values reflect the market values of the assets).

Concluding comment

The shortcomings in the ACG's methodology are such that the estimated q ratios from the asset sales provide no meaningful information concerning the sufficiency or otherwise of regulated rates of return for the purposes of encouraging socially desirable new investment. This is all the more so given that the uncertainties that prevail in the context of new investment (given the inherent uncertainties associated with new investment and the way that it is affected by regulatory uncertainty).

Indeed, if regulated rates of return were as attractive as is suggested by the ACG report, one must ask why is it that virtually all investment in gas transmission infrastructure has been directed towards assets which the investor expects will never be subject to regulation. This is hardly an outcome one would expect in an environment in which regulated charges were overcompensating owners of regulated infrastructure.

1 Introduction

As part of its submission to the Productivity Commission's Review of the Gas Access Regime, BHP Billiton commissioned the Allen Consulting Group (ACG) to prepare a report commenting on economic issues. A key element of the ACG report was an assessment of empirical evidence concerning the issue as to whether regulators have set prices that are too low for the regulated businesses to support the regulated services.

ACG's conclusion was that the market value of regulated businesses significantly exceeds the 'regulatory value' for those firms studied. On the basis of its analysis, ACG came to the conclusion that:[1]

> regulators systematically err in favour of providing regulated entities with a return that exceeds the cost of capital associated with the regulated activities.

This paper critically assesses ACG's conclusions. In essence, the paper argues that the conclusions drawn about the magnitude of the q factor must be interpreted with considerably more caution than appeared in the ACG analysis. In addition, this paper argues that the ACG report incorrectly ascribed inframarginal impacts from an analysis of average q ratios to affect the marginal conditions that determine investment incentives. In light of these findings, it is argued that the ACG analysis does not support its conclusion that regulatory rates of return are sufficient to stimulate new investment.

[1] The Allen Consulting Group, "Review of the Gas Code, Commentary on Economic Issues", August 2003, page 5.

2 Explanation of ACG's "Tobin q" analysis

2.1 Outline of the ACG report

Nobel Laureate James Tobin developed an approach for measuring the relationship between the market value of physical assets and their undepreciated replacement costs. He called the ratio of market value to replacement cost the q factor. As expectations about future earnings are incorporated into the market's valuation of the assets, the q factor provides a forward looking approach to comparing market value with the replacement cost of the underlying asset.[2]

ACG applied an adaptation of this approach to analyse the relationship between the market value of a regulated activity and its regulatory value. The ACG report presents an empirical study of the ratio of market value to 'regulatory value' (a variation of the *depreciated* replacement cost) for a selected group of private Australian gas and electricity transmission and distribution firms. ACG considered that these values would be identical if:[3]

> the regulator set price controls that compensated exactly for the cost of undertaking regulated activities (including the provision of a risk adjusted return)…

ACG derives the result that the market value significantly exceeds the 'regulatory value' for those firms studied. This led ACG to conclude that regulatory rates of return exceed the cost of capital to regulated firms. The results are illustrated in Figure 1 below.

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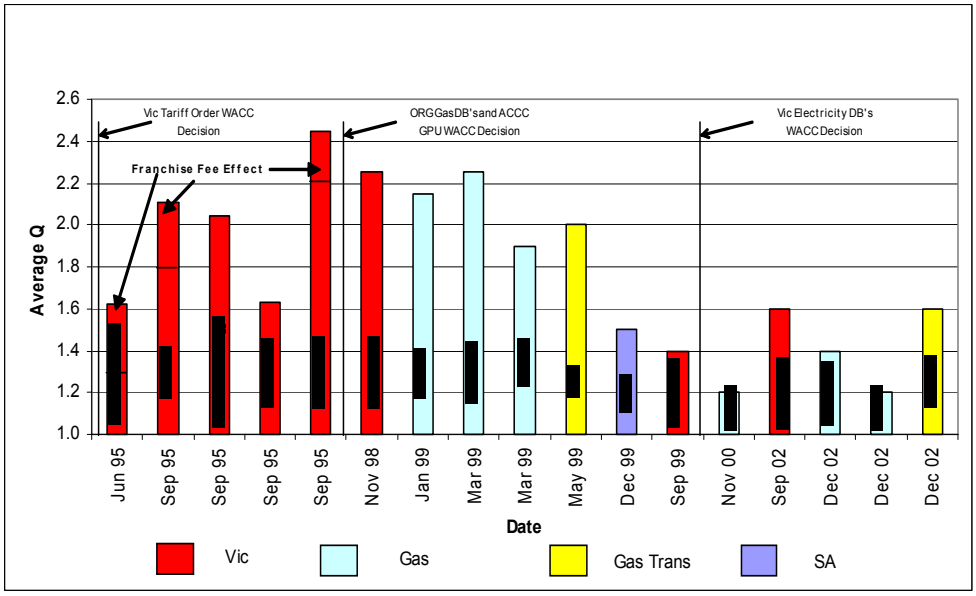
[2] McKibbin, Warwick, J., and Eric S. Siegloff, (1987), "A note on aggregate investment in Australia", Reserve Bank of Australia Research Discussion Paper, page 2. Indeed, in much of the empirical work that has been conducted on q ratios, the empirics do not focus on whether the value of the q ratio is more or less than one, but rather on changes to the value in the q ratio over time.

[3] Ibid, page 5

Chart 1 **Summary of ACG Results**



Source: ACG

In order to establish the value of the regulatory q ratio empirically, ACG have had to devise a method of calculating the market value at a particular point in time and a method of calculating the regulated value at the same point in time. The latter can be done relatively easily, so we will discuss that first. ACG's equation (1) sets out a discounted cash flow approach to determining the regulated asset value.[4] Most of the relevant inputs can be derived from regulatory reports.

For example, for gas transmission and distribution companies, it is relatively straightforward to determine the regulated asset base as the Gas Code requires the regulator to determine an Initial Capital Base (ICB). The ICB is the regulated value at the reference date, and valuations can be found for other dates by making adjustments from this point for depreciation, accounting for asset disposals and allowing for capex.[5]

Determining the appropriate market value for a q ratio analysis is more complex. The market values firms, but it is rare that there is exact correspondence between the assets comprising a firm and those subject to economic regulation. Consequently, the market values of the firms considered in ACG's analysis must be adjusted to overcome the

[4] Ibid, page 45.

[5] This type of dead reckoning involves applying depreciation, accounting for asset disposals, and including new capex at cost.

difficulties associated with establishing a 'market value' for one asset held by a multiple-asset firm, when the only market information relates to the firm as a whole.

ACG uses two approaches to the market valuation problem. For some specific assets which have either been privatised or sold subsequently through a trade sale, it is possible to use the sale price as the market value at the time of the sale. This value can then be used to provide a basis for the estimation of the market valuation at the time of the nearest regulatory valuation. An alternative approach was taken for the market value of a listed entity which was assessed as being equal to the sum of the market value of the shares and the value of debt.

To estimate asset-specific q ratios from these market valuation data for those firms that comprise a portfolio of regulated assets, ACG divided the market valuation of the firm by the sum of the regulated valuations of the individual assets to derive a q value for those firms.

For many of the firms considered, the regulated asset-based business is part of a wider operation. The ACG analysis ignores many of the unregulated components of the businesses involved concentrating predominantly on those that involve energy retailing. In particular, ACG has used spot sale prices from a small number of past sales of energy retail businesses to derive a possible range of valuations expressed in terms of business value per retail customer for the retail component of the operation. The range thus generated is extremely large (from $238/customer to $878/customer) with the result that ACG's q ratio estimates for the regulated parts of these businesses have had to be expressed as a range, depending upon the assumed valuation of retail per customer.

Having obtained a range of q ratios for the companies studied, ACG observes that they are generally significantly higher than 1, meaning that the calculated market valuation is significantly higher than the calculated regulatory value. From this observation, ACG draws the following primary inference:[6]

> Accordingly, the observation of a large wedge between the market value of an asset and its regulatory value makes it highly unlikely that regulators could be understating the cost of capital associated with the regulated activities of the relevant business.

ACG therefore assert that the cash flow permitted by the regulator is valued more highly by the stock market than it is by the regulator and in turn put the proposition that investors must be applying a lower discount rate (r_{inv}) than the regulator (r_{reg}). That is:

$$\text{if } \sum_{t=1}^{n} \frac{CF_t}{(1+r_{reg})^t} < \sum_{t=1}^{n} \frac{CF_t}{(1+r_{inv})^t} \text{ then } r_{reg} > r_{inv}$$

[6] Ibid, page 61.

This is ACG's central proposition. In the following sections, we review its relevance to the real issue at hand, namely, whether the material presented by ACG in fact provides evidence that regulatory rates of return are sufficient to induce new investment.

2.2 Underlying assumptions

The supporting assumptions are heavily dependent on the notion of efficient capital markets. They are essentially the same assumptions that support the Capital Asset Pricing Model ("CAPM"). The assumptions include that securities markets are:

- highly competitive and populated by sophisticated, well-informed buyers and sellers;
- dominated by rational, risk-averse investors who seek to maximise the risk-adjusted returns from their investments – investors prefer more wealth to less and demand a premium return for bearing higher risks;
- frictionless, in the sense that there are no transaction costs, no restrictions on borrowings, lending or short selling; and
- individual security returns follow specific probability distributions and investors share common beliefs[7] as to the probable distribution of returns.[8]

In general, these assumptions do not hold sufficiently to secure full capital market efficiency. For example, not all buyers and sellers are well informed and will form differing views on the distribution of returns. Also, market participants have different risk preferences and therefore will accept different rates of return for accepting the same level of risk. The violations of these and the other assumptions underpinning the CAPM would undoubtedly lead to the mis-pricing of assets as illustrated in various Tobin q studies, most notably Brainard, Shoven and Weiss.[9]

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[7] Or alternatively, investors are only provided access to the same financial information and interpret that information from with a common language – financial performance ratios etc.

[8] Shapiro, (1991), *Modern Corporate Finance*, Maxwell Macmillan International Edition: New York, pages 121-127.

[9] Brainard, William C., Shoven, John B., and Laurence Weiss, (1980), "The Financial Valuation of the Return to Capital", *Brookings Papers on Economic Activity 2: 1980*.

3 Two fundamental problems in ACG's estimates of q ratios

This section explores two important conceptual difficulties with the approach that ACG has adopted to estimate q ratios for regulated firms. This discussion will then form the context for the more detailed investigation of ACG's results that will be reviewed in the following sections.

3.1 ACG's use of valuations at the point of sale

Subject to adjustments for the value of retail businesses, ACG's approach assumes that all the factors that are relevant to the valuation of regulated businesses will be fully reflected in the regulatory asset base of the assets which comprise it. ACG's report states that:[10]

> It necessarily follows that if the regulators were to achieve the objective of setting a price that was expected to permit all costs to be recovered – including a reasonable (risk-adjusted) return that is equal to the actual cost of capital for the asset – then the actual market value of the asset in question and the regulatory value would coincide precisely with the regulator's target for the market value (i.e. the regulatory asset value), at least at the time of a regulatory review. Thus, to the extent that the market value of the asset exceeded the regulatory value, then the regulated charges would overcompensate for the cost of providing the regulated service.

AGC then base their estimates for market valuations on either the sale price for the business at the time a privatisation or trade sale takes place or, in the minority of cases where the businesses are listed entities, the share price.

However, there is an essential reason why the sale price of, say, a privatised asset might be expected to exceed its regulatory value. *The sale price will reflect the investor's expected value of the business operating under new ownership.* Note the two aspects to this statement.

First, the reason that the sale takes place in the first place is that the new owners (believe they) have skills or access to opportunities that will make the asset more valuable in their hands than in the hands of the previous owners or the market on average. Consider the situation where there are a number of potential bidders with different attributes and where, for the moment, the individual (potential) bidders know with certainty what the value of the business will be in their ownership.

In a competitive sales process, it will be rational for the winning bidder – the investor – to bid more than the value of the business to the previous owner or, indeed, an average

[10] Page 46.

market valuation of the assets involved. Thus, even with an absence of uncertainty, the bid would exceed the regulatory value.

Secondly, the bid could well be higher when uncertainty is introduced. For, as stressed above, the bid will be driven by the investor's *expectations* as to the future free cash flows that can be generated by the business and the level and nature of the associated risks. These expectations will vary amongst investors, both in terms of the likely outcomes of future regulatory processes as well as the opportunities to earn revenue from unregulated sources.

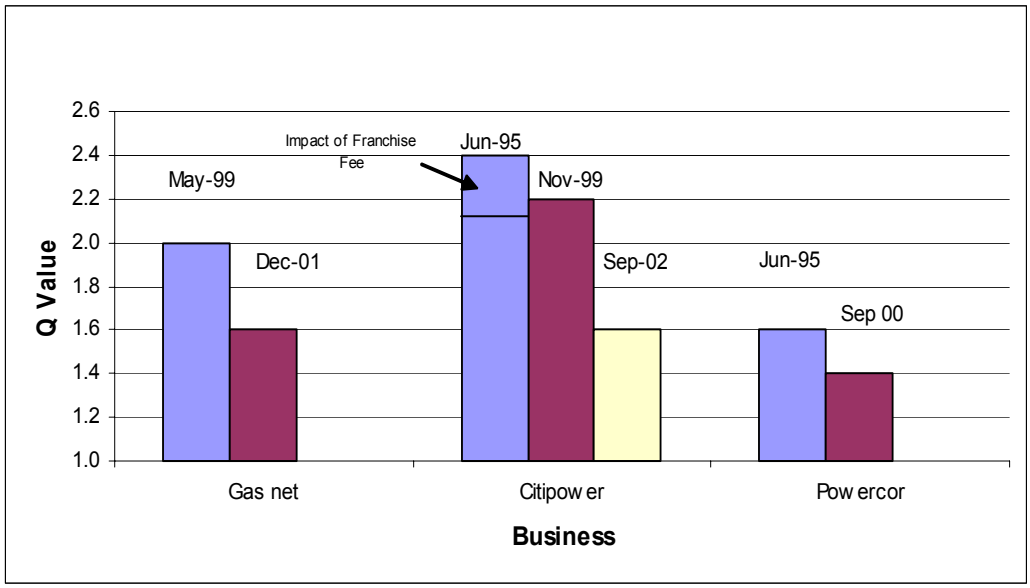
These variations are especially important in the context of a privatisation (or asset sale) process. In these processes, the successful bid will generally be the highest, which in turn suggests that it is likely to have been underpinned by the most optimistic expectations. The propensity for competitive bidding processes to result in successful bidders adopting the most favourable forecasts and hence paying too much for an asset has become known in the economics literature as the "winner's curse".[11] A feature of such an environment is that the greater the uncertainty surrounding future outcomes, the greater is the scope for expectations amongst bidders to diverge.

Accordingly, it should be expected that in the face of uncertainty, rational buyers will adopt a range of expectations as to the future revenue earning capacity from any asset, including assets subject to uncertain future regulatory outcomes.

Note that over time the uncertainty can be expected to reduce. Buyers will develop a clearer understanding of how valuable ownership of the assets is in their hands. Furthermore, there has been substantial evolution in regulatory practice over the period studied. This evolution suggests that there is likely to have been substantial uncertainty surrounding the assessment of likely regulatory outcomes throughout the period. This is reflected to some extent in falling q ratios ascribed to the resale of businesses as, in fact, is evident in ACG's estimates (refer Figure 2).

[11] The tendency for the highest bidder to pay "too much" is sometime referred to as a "winner's curse" (see Capen E, Clapp V and Campbell W (1971) "Competitive bidding in High-Risk Situations", *Journal of Petroleum Technology,* 23 pp 641-653. The concept of a winners curse has also been applied in the analysis of the tendency for takeover bidders to systematically overstate the gains that can be secured from a takeover (see Roll, R (1986), "The Hubris Hypothesis of Competitive Takeovers", *Journal of Business*, 57, 197-216).

Chart 2 **Reductions in q values over time**



Source: ACG Report, NECG analysis

The above indicates that we might expect a tendency for the q ratios for ACG's sample to be higher for those businesses subject to privatisation than those sold through private sales. A related hypothesis is that the q ratios for those listed entities in the sample where the ratios have been estimated from their share price but not the subject, at the time of measurement, to a sale will tend to be among the lowest in the sample.

The thinking behind this is that the sales transactions would never have proceeded if the bids from purchasers did not exceed the vendor's reservation value (the value to the vendor of the businesses remaining in the vendor's hands). In other words, the q values inferred from the above chart for each sale must have been higher than the vendor's own valuation of the q ratio (that is, the vendor's valuation of the business) – otherwise the sale would never have occurred. This is all the more so for second round sales on account of the very substantial losses evident in the resale prices relative to the prices that were initially paid for the assets.

Moreover, many of the opportunities to generate these free cash flows will arise only indirectly from the regulated assets themselves. In the context of the revenue from unregulated activities, both the quantum and the future regulatory treatment of such revenues will generally have been uncertain at the time of these sales – and valuations will have varied accordingly. Again, the highest bid is likely to have been underpinned by the most optimistic expectations.

Consequently, the ACG approach is simplistic and fails to reflect the valuation process undertaken by an informed investor. Such an investor would have regard to all factors that

can enhance (or detract from) the earning capacity of the regulated business. This will extend to expectations regarding future regulatory treatments, taxation considerations, and so on.

In the following sections, we consider several of the factors in more detail, recognising that, by their very nature, they will tend to vary with each business. However, before investigating this issue, we first draw a crucial distinction (that was assumed away in the ACG report) between the average and the marginal q factor.

3.2 The use of average rather than marginal q ratios

A regulated rate of return is intended to perform two roles:

- to remunerate past investment; and
- to provide a signal to encourage new investment.

The ACG approach focuses on the first role of the regulatory weighted average cost of capital (WACC), namely that of remunerating past investment, and in so doing, simply assumes that the second role will follow inevitably from the first:[12]

> Provided that the relationship described above holds for new assets in the same proportion to existing assets – which seems a reasonable assumption – then, far from deterring investment, the rewards available for investing in the regulated services exceed those required. That is, more than enough incentive to invest exists. In simple terms, $1 invested in the business would be transformed into between approximately $1.40 and $1.60 – which is an option that a business interested in maximising shareholder returns logically would take.

In other words, ACG's approach assumes that the calculated q ratios (necessarily a valuation reflecting the "average q value" for past investment, once allowance is made for other beneficial cash flows indirectly connected with the assets) directly translate into the anticipated q value to encourage new investment.[13]

ACG's view that new assets would face the same q ratio as a firm's existing regulated assets is a critical but unsubstantiated assumption in their analysis. There are good reasons why one should take great care in making this assumption. For it is the incentive to invest in new infrastructure – incentives that will be reflected by the marginal q – that is central to the issue of whether the current regulatory settings sufficiently encourage socially desirable investment.

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[12] Page 62.

[13] Page 60.

It is well known that the average and marginal q values for a given firm can differ – indeed, it would be surprising if such differences did not occur in practice. For example, Tobin and Brainard point to some situations in which they will differ:[14]

> A firm with monopoly power, or other sources of diminishing returns to scale, will have an average q ratio higher than its marginal q.

In the businesses included in the ACG sample where diminishing returns to scale will generally be pronounced, the marginal q-values (that is, for new regulated investments) will be lower than ACG's estimates based on average q ratios.[15]

3.3 Implications

The ACG report does note that its analysis is subject to a variety of uncertainties. As we discuss in the following sections, these uncertainties are large and do cast significant doubt on the conclusions that are drawn.

But the problems with the analysis are more severe than this. The combination of reliance on valuations at the point of sale and the use of average rather than marginal q ratios provide strong *prima facie* reasons to expect the ACG's estimates to provide *biased* results. While it is not possible to provide a precise quantification of the biases involved, the following sections explore the broad dimensions involved.

In particular, we examine the many factors that ACG's analysis ignored, noting that this assessment in itself is incomplete. Some of these factors, such as the impact of favourable tariff rulings, are simply wealth transfers and hence do not in any way affect the marginal q. Others, such as the impact of unregulated revenues earned from existing infrastructure are inframarginal in the sense that they will affect the average q factor but not the marginal q. A final category is the factors that affect marginal (as opposed to average) q ratios. It is only this final category that is relevant for future investment decision making (although the extent to which this occurs is also unclear).

This discussion is followed by a quantitative assessment of the impact of these factors on the q ratios that were determined in the ACG report. We develop a simple model using assumed ranges for these factors to illustrate why the ACG report would necessarily have over estimated q ratios and in so doing highlight the extreme caution that must be exercised in interpreting the ACG analysis.

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[14] Tobin, James and William C. Brainard, (1977), *Asset Markets and the Cost of Capital*, page 243.

[15] Note that for much of the empirical work in the literature that investigates investment behaviour against changes in the q ratio, the distinction between the average and marginal q will not be important since the average and marginal q ratios will tend to be highly correlated. However, the distinction becomes critical if the exercise involves an examination of the *level* of the q ratio – that is, whether it exceeds 1 or not, as ACG attempted to investigate.

4 Regulatory factors influencing purchase prices

4.1 Introduction

Section 3.1 outlined the type of factors that could significantly impact on the value a potential investor would ascribe to a particular business and therefore the purchase price. It is not possible to fully measure the impact of the forces involved, in large part because the influences will be peculiar to the specific purchaser. Notwithstanding this important qualification, this section is to outlines the dimensions of some of the important considerations associated with the sales process.

The principal regulatory factors considered here are as follows:

- favourable tariff rulings, as well as expectations that favourable regulatory conditions would continue to prevail; and
- tax arrangements.

4.2 Favourable tariff rulings

At the time of the initial privatisations, bidder's valuations of the businesses were naturally heavily influenced by the revenues that could be earned from the regulated assets. Often the sales were undertaken against the backdrop of a Tariff Order which set an initial price path (including, where appropriate, retail prices for non-contestable customers) for a defined period after which prices would be reset by the regulator. In addition, in some cases, the Tariff Order provided guidance as to how future regulatory reviews would be undertaken and the issues that would be considered in the subsequent regulatory processes.

It was common for the tariffs initially determined for privatisation candidates to include a significant premium over those that might have applied had the businesses been subject to independent regulation at the outset. The sheer magnitude of the reductions arising from subsequent regulatory processes illustrates this fact (noting that it remains an open issue as to whether these reductions have been too dramatic). However, bidders for the businesses, particularly in the early privatisation processes which occurred well before the emergence of any regulatory precedent, would have held a range of views as to future regulatory outcomes.

Table 1 sets out the changes that were made to distribution charges in Victoria as a consequence of the first review of the Office of the Regulator General.

Table 1 **Level of X in ORG's First Review**

	X to apply in first year (2001)	X to apply in each year 2002 to 2005
AGL	15.5	1
CitiPower	11.2	1
Powercor	14.5	1
TXU	18.4	1
United Energy	9.1	1

Source: Office of the Regulator General, 2001 Electricity Distribution Price Review Re-Determination

Any premium in the initial prices was clearly not a windfall for the businesses. Instead, the premium was aimed at maximising the purchase price. The competitive tendering process resulted in the impact of any excess returns being capitalised into each bid and in turn the purchase price. Accordingly, the privatisation process simply provided a very efficient vehicle for State Governments (as vendors) to secure a substantial one off windfall from the sale process.

The extent of the increase in the purchase price would have depended upon each bidder's expectations of future regulatory arrangements. It is likely that each bidder's expectations of future regulatory arrangements (including the expectation of 'light handed' regulation) would have been influenced, at least to some extent, by those prevailing at the time of purchase.

A good example of where bidder's initial and perhaps longer term expectations as to the regulatory environment arises in the context of the WACC allowed to the businesses as part of the Tariff Order processes. In general, the allowed WACC for the Tariff Orders was above the 'true' risk weighted rate of return for the respective businesses. The presence of such a premium would have had the effect of increasing the bid price and hence inflated the ratio of the market value divided by the regulatory asset base. Indeed, it is possible that this 'WACC effect' may well have had memory in the sense that it conditioned bidder's expectations as to the level of allowed returns into the future, especially for the early privatisation processes.

However, as the capitalisation of the premium in the bid price was simply a vehicle for effecting a transfer from affected customers to the vendor State Government, that transfer, in and of itself, would not have had any impact on the incentives to invest.[16]

This premium was not confined to the initial sale of the Victorian electricity distribution businesses as is implicitly assumed by ACG in its report. (ACG argued that the initial premium embedded in the initial Tariff Order was fully accounted for in the franchise fee

[16] The interaction of inflated WACCs and incentives to invest is complex and addressed in section 7 of this report.

that was paid as part of the sale process for the Victorian electricity distribution businesses.)

Indeed, other privatisations also involved significant premia being embedded in prices. This was not always effected in the context of the distribution prices that were payable. For example, in the case of the sale of the Victorian gas businesses, the premium was embedded in the retail margin instead of the price for the distribution service.

To illustrate the potential magnitude of this effect, an estimate of the impact of the WACC premium has been calculated based on two possible views of investor expectations from the privatisation of the Victorian electricity businesses:

- the continuation of the initial premium over the risk free rate implicit in the returns allowed under the Tariff Order in perpetuity; and
- that changes to returns in future regulatory resets would be progressively implemented via a glide path rather than through a one off, immediate, adjustment at the time of the reset.

It is emphasised that the WACC premium represented just one of the factors that would have influenced bidders – the impact of other factors , such as higher than expected growth or efficiency gains, are set out in Section 5.

Maintenance of WACC premium in perpetuity

The revenues established under the Tariff Order were based on a pre-tax real WACC of 10.9 per cent for urban businesses and 11.9 per cent for rural businesses (after inclusion of a 1 per cent uplift factor). As part of the regulatory review process the Victorian distributors indicated that the 10.9 per cent rate was equivalent to 9.2 per cent after adjusting for changes in financial market parameters (principally due to reductions in the real risk free rate over this time).[17]

In its Final Price Determination the ORG adopted a pre-tax real rate of return of between 6.8 per cent and 7.2 per cent some 200 basis points lower than the WACC including the premium implicit in the Tariff Order (or 300 basis points for the rural distributors Powercor and Eastern Energy/TXU).

In making its Final Determination, the ORG undertook extensive consultation with all stakeholders during which the distributors provided a range of submissions outlining evidence of how the original purchase bids were influenced by expectations of high

[17] *Electricity Distribution Price Review: Achieving a Balanced Outcome*. Joint submission by the five Victorian distribution businesses to the Office of the Regulatory General, July 2000

returns and lighter handed regulation. However, in the final analysis, the ORG concluded that:[18]

> …it is not appropriate in its *Determination* of the 2001-05 price controls to underwrite the expectations held and financing arrangements adopted by the initial purchasers of the distribution businesses in 1995.

That is, the ORG did not contest that the purchasers may have had certain expectations at the time of the purchase, or that those expectations may have underpinned the high prices offered. Rather, the ORG concluded that the regulatory framework prevailing in 2000 did not provide for those expectations to be reflected in the tariff outcomes.

It is acknowledged that the comparison between the allowed WACC under the Tariff Order and that adopted by the ORG represents the maximum impact of the WACC effect (noting that several other factors are also relevant to influence the purchase prices for the assets, some of which being discussed below). This is because the central contention is that the allowed rates of return in the subsequent regulatory process conducted by the ORG were too low.

The impact of this premium was up to 200-240 basis points in real pre-tax terms (with another 100 basis points applying for the rural distributors) based on the difference between the real rate of return embedded in the Tariff Order and that which was ultimately adopted by the ORG. Whilst it is likely that this figure overstates that extent of the premium *expected* by bidders (by virtue of the concerns expressed that the allowed WACCs were too low), it nevertheless provides one benchmark for comparison purposes.

From the following table, it can be seen that the annual impact ranged from $9 million/yr for AGL through to nearly $34 million/yr for Powercor (assuming that there is no growth in the real terms value of assets with capital expenditure simply matching depreciation).[19] This range increases to a NPV of over $100 and nearly $380 million for AGL and Powercor respectively if the premium were to be available in perpetuity.

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[18] *Electricity Distribution Price Determination*, Highlights and Executive Summary, September 2000, pg 10.

[19] ACG reported the regulated asset value for the distributors adjusted to the date of purchase at page 70 of their report.

Table 2 **Impact of alternative WACCs**

	RAB	WACC Premium	Impact $m/yr	Impact in Perpetuity
AGL	448	2.0%	9.0	101
CitiPower	656	2.0%	13.1	147
Powercor	1,123	3.0%	33.7	379
TXU	906	3.0%	27.2	305
United Energy	936	2.0%	18.7	210

Source: NECG estimates

It is highly likely that had the Tariff Order been limited to the same risk weighted rate of return at the time of purchase as that which ultimately prevailed, bids would have been lower by an amount reflecting the present value of the premium. The impact of such an adjustment on ACG's q calculation is outlined at the end of this report.

Removal of premium via a glide path

In a similar vein, it is possible that potential purchasers of the distribution businesses would have only fully factored in the impact of the WACC premium for the first regulatory period covered by the Tariff Order and that they would have assumed that the premium would then have been progressively removed over the following regulatory period. That is, the bidders would have factored in 5 years of a full WACC premium and 5 years during which the premium would be progressively reduced to zero.

Table 3 illustrates the impact on valuations of what may appear to be an innocuous assumption concerning the adjustment path that at least some bidders may have expected the authorities to adopt. The valuations are otherwise based on the same assumptions as used in the perpetual valuation estimate above.

Table 3 **Impact of an alternative adjustment path on valuations**

	RAB	WACC Premium	Impact $m/yr	NPV Glide Path Impact
AGL	448	2.0%	9.0	47
CitiPower	656	2.0%	13.1	69
Powercor	1,123	3.0%	33.7	177
TXU	906	3.0%	27.2	143
United Energy	936	2.0%	18.7	98

Source: NECG estimates

4.3 Tax situation

The privatisation process was designed to be highly tax efficient. Indeed, one of the key competitive dimensions in a privatisation process is the extent to which bidders can adopt tax efficient structures. Other things being the same, the more efficient the tax structure, the higher the bid that a purchaser would be prepared to submit, and the greater the chance of that bid being successful. The scope for the exploitation of tax efficient structures was particularly prevalent in the rules that prevailed for the early privatisation processes.

This is especially the case since at this time, the regulatory framework was premised on estimating required revenues using a pre-tax real framework. This framework assumed that businesses paid tax at the statutory rate notwithstanding their actual tax position and therefore, any business that was able to defer tax liabilities or which held significant accumulated tax losses stood to benefit from its zero tax liability status whilst that status was maintained. Hence, it is reasonable to expect that a large proportion of the expected benefit of tax efficient structures would have been capitalised into bid prices.

Again, a large proportion of these tax efficiencies that were pursued through the various sale processes represented transfers. However, in this instance, the bidder provided a vehicle for the transfer between State Governments (as vendors being the recipients of the premia attributable to tax efficient structures) and the Federal Government.

In actual fact, these transfers largely preserved the State Government's tax position in relation to the sale process. After all, had the then Government Business Enterprises remained as such, the State Governments would have continued to receive tax equivalent payments - a stream of revenue that was foregone with the sale of the businesses to the private sector. As such, the capacity to bring forward this stream of revenue, via the capitalisation of the expected benefit of tax efficient structures adopted by purchasers, may well have been an important factor motivating the privatisations in the first place.

There is a further source of tax benefits that needs to be considered in this context. The presence of foreign tax benefits presented the possibility that there could be transfers between foreign governments and the State Governments (again as vendors). A range of options has been pursued to secure these benefits, including cross border leases and the adoption of structures that allowed depreciation credits to be earned in foreign jurisdictions.

The key point is that the price that was paid for the businesses the subject of the ACG study was based on an assumption that the bidder would be able to internalise, over time, the benefit from the adoption of an efficient tax structure and that a large proportion of this expected benefit would have been capitalised into bids.

Yet in its analysis, ACG makes no mention of the tax positions of the businesses at their time of sale or any allowance for their impact in calculating q ratios. Accordingly, removing the value accretive impact of any tax positions adopted by successful bidders from the market valuation would reduce ACG's q ratios. The sensitivity of this adjustment is addressed in Section 6 below.

5 Factors with inframarginal impacts

In this section, we examine factors which have the impact of increasing the value of the business but are inframarginal in the sense that they increase the value of the business (and hence the "average q") but do not have an impact on stimulating or otherwise new investment.

It must be remembered that bidders' expectations of future cash flows that they are able to generate from the assets will be a function of their assessment of the additional value that their superior management can bring to the organisation. This overwhelmingly affects the existing asset base rather than new regulated assets. Consequently, the impacts considered in this section typically would have the effect of increasing the value of the business but not necessarily do so in a way that would encourage new investment.[20]

The inframarginal factors identified are as follows:

- unregulated activities and assets;
- out-performance of X factors;
- asset productivity;
- expectations of benefits in future regulatory reviews;
- strategic values; and
- other factors.

We address these issues in turn.

5.1 The value of the unregulated business and assets

There are a range of unregulated business activities and assets that affect the free cash flows that can be earned by regulated entities in addition to those earned through the provision of regulated services:

- retail operations;
- unregulated activities utilising the natural monopoly assets;
- other unregulated activities.

[20] Some of the factors identified will also be relevant to new investment, but only to the extent that new investments are able to explicitly capture such benefits and accordingly, we defer consideration of this issue to the next section of this paper.

5.1.1 Retail operations

When undertaking its analysis, ACG acknowledged the following methodological challenge:

> Another factor which may cause a difference between the market value and the regulatory value of an entity is where the entity undertakes other activities in addition to the regulated activities. The most common example in the energy area would be a distributor also undertaking retail activities.

ACG's method for estimating the value of the retail component of the business was to examine four transactions involving stand-alone electricity retail businesses, and one involving a stand-alone gas retail business. In each case the sale price was divided by the number of retail customers at the time of sale, and a set of five retail valuation yardsticks was thus established.

Unfortunately the range was from $238/customer to $878/customer. While that is a large range, there is no objective reason to suppose that $878/customer is necessarily the upper limit. The result was that ACG ended up using a range of values for retail businesses based on a per customer value between $200 and $1000.

It is likely that the values at the upper end of this range are more appropriate. The reasons for this view are as follows:

- the reliance upon the sale of stand alone retail entities will tend to bias valuations downwards;
- the limited data set of valuations of gas retailers suggests conservatism is warranted; and
- the reliance upon customer numbers as the valuation metric also suggests that conservatism is warranted.

Energy retail businesses are rarely sold as stand-alone entities, partly because energy retailing involves very substantial risks. These risks are usually managed through vertical integration with the counterparty to the transactions giving rise to the risk. Electricity retailers are increasingly seeking to merge with electricity generators in order to benefit from a natural hedge against electricity spot market price volatility. Gas and electricity retailers are often combined with the associated distribution businesses.

These factors suggest that the seller of a stand-alone energy retailer may find it difficult to find a buyer with the right 'fit' in terms of hedging possibilities. If such a buyer can be found, it is likely to have a strong bargaining position relative to the seller, and this may translate into a sale price which is below the buyer's valuation of the retail business. Thus it would be a mistake to attempt to infer too much from the very small number of sales of retail businesses.

As far as gas is concerned, ACG's sample contains only one data point - the sale of the Energy 21 retail business to Boral in March of 1999.[21] Empirical estimates based upon a single observation should be treated with great care.

Finally, ACG's analysis is conducted on the assumption that the number of customers is the sole determinant of value in a retail business. Again, this indicates that caution is required for valuation purposes.

In summary, there are strong reasons to expect valuations based on the sale of retail assets in a stand alone form will bias downwards the valuation of those assets. Accordingly, the values at the upper end of the $200 per customer to $1000 per customer range are more appropriate for current purposes.

5.1.2 Unregulated activities utilising regulated assets

Even within the regulated businesses themselves, it is likely that potential purchasers would have been assessing the opportunities to derive additional unregulated revenues and valuing the expected returns from doing so.

To date, the regulatory treatment of revenues generated from unregulated services using regulated infrastructure has focused on preserving the incentives for network businesses to continue to identify and exploit these opportunities (recognising that doing so brings new risks to the business). In so doing, regulators have recognised the importance of dynamic efficiency in maximising the social surplus from the regulated networks. Consequently, the regulatory treatment of the revenue derived from the use of regulated infrastructure in unregulated activities has been to allow such revenues to be retained (or at least the bulk of such revenues to be retained).

For the owners of electricity distribution networks, there was a range of opportunities to pursue. These included activities such as constructing an optic fibre network or raising the height of stobie poles for mounting mobile phone stations. In addition, the existing network could be utilised to provide opportunities for the rental of pole and duct space to facilitate the roll out of fibre optic cable.

For gas transmission pipeline businesses, a potentially significant benefit is the value placed on a gas pipeline's long-term contracts by the market. It is usually the case that operators of transmission pipelines have long-term contracts with foundation customers and other shippers. Such long-term contracts protect shippers from price shocks and pipeline operators from demand shocks (via take-or-pay style arrangements). The nature of many of these contracts, especially those involving take-or-pay provisions, is that changes in the regulated tariff may not be fully reflected in the pipeline's revenue. In fact,

[21] Ibid, page 66.

in the absence of specific contractual arrangements, changes in the regulated price will often have no impact on the revenues paid by customers under long-term contracts.

The existence of these foundation contracts can also have an inframarginal accretive impact on valuations of existing gas transmission pipelines. There are several reasons why this may be the case:

- the market value of a firm owning a gas transmission pipeline can change over the life of the pipeline even though it is not earning any monopoly profit, considered over the life of the investment. Consider a new investment that is NPV neutral but which experiences material losses in the early years of its life (as will generally be the case). In such a case, the initial investment would have been predicated upon increasing returns over the life of the pipeline. As volume builds, it may well have a market value that exceeds its depreciated replacement cost, especially given the straight line approach to depreciation that is applied by Australian regulators. In other words, the ACG approach could easily yield a q ratio greater than 1 for much of the life of the asset even though no monopoly rent is ever earned by the asset; and
- real options value may change over the life of the investment as new opportunities present.

In addition, the systematic risk of a firm can change as its operations change. For example, following the commissioning of a new gas transmission pipeline, the owner's exposure to construction risk will decline, and with it, the firm's value could be enhanced to the extent that the systematic risk of its operations falls.

Again, it must be remembered that the more optimistic the assumptions that underpinned the analysis of these factors, the more likely it was that the bidder would have succeeded. This in turn suggests that valuations would assume that all of the unregulated revenue derived from the use of the network would be retained and that a relatively high and profitable utilisation of network assets would be accomplished by the successful bidder.

5.1.3 Other unregulated activities

In virtually any regulated business operation, there are a range of opportunities that arise from unregulated activities that are not directly connected with the physical infrastructure, including:

- enhancing existing unregulated operations;
- establishing new unregulated operations.

Enhancing existing unregulated operations

Several of the businesses included established operations that were successfully competing in unregulated markets. In relation to these operations, bidders would have taken positions on the opportunity to increase the scope and profitability of these operations.

For example, the only unregulated asset of value that ACG specifically recognised in its report relates to GasNet's LNG facility. However, this is not the only unregulated activity in which GasNet is involved. For example, GasNet also has significant gas metering and project operations (including providing operations and maintenance assistance to third party pipelines). These later operational areas make a contribution to GasNet's EBIT which is of a similar order of magnitude to its LNG operations. However, these later operations, and the value of the intellectual property required to provide the relevant services, were ignored in the ACG valuation.

Establishing new unregulated operations

In the initial privatisations nearly all of the businesses were sold to new entrants with no established branding in Australia. Ownership of a distribution or a retail business afforded the opportunity to establish a very high degree of recognition for the brand the owner adopted by virtue of the established customer relations and the very high penetration levels of the services that were provided. This would be particularly the case where there were perceived to be opportunities to extend that brand into other unregulated markets.

The valuation of brand names is complex – in part due to the fact that a substantial portion of this value derives from associated option values. These options values provide the holder with the right but not the obligation to exploit branding attributes by investing in commercial opportunities as they present. There is clearly a degree of variability as to the distribution of expected returns from pursuing these opportunities. Yet it is this variability that drives options values associated with brand names. This is because investments are only committed when they are expected to have positive NPV values, that is as and when the opportunities arise.

Take for example, an investment opportunity in telecommunications. Even though the NPV of an investment in telecommunications is negative today, the value of an option to enter the market in the future may still have a high value if there is considerable variability in future industry outcomes. Having the option to invest means that the owner of a distribution network would only commit funds to that sector if states of the world emerged that indicated that there was an expectation of a sufficiently high probability of sufficiently positive returns to be earned from the investment for it to be justified. Consequently, it is

the variability in the distribution of the expected returns that is significant for the valuation of options and brands. However, no account was taken on these values in the ACG report.

There is also a range of other intangible asset values that were ignored in the ACG report but that would be significant in any commercial valuation process. These include the accumulated knowledge and expertise of staff, engineering competencies and so on. ACG did not recognise any potential for these values to be exploited by regulated businesses yet such capacities are already being commercially applied by regulated businesses and can be strongly value accretive.

In addition, purchasers of the regulated businesses would also have had an eye to the potential for unregulated expansions of the network to enhance the value of the businesses in the future. This is particularly the case for gas transmission pipelines. Whilst there is no doubt that the market for new pipelines is contestable, there is also the prospect of businesses benefiting through the economies of scale, scope and density and the exploitation of intellectual property that may present in respect of new unregulated opportunities that arise.

5.2 Expected efficiency improvements

In considering purchasing previously Government owned and operated assets, potential purchasers would have assessed the opportunity for more efficient operation of the businesses. Historically, Government owned businesses have been required to satisfy both commercial and non-commercial objectives and, as such, it would be normal to expect that significant efficiency improvements could be captured by a new owner.

Such improvements are not limited to the sale of Government owned businesses, but would also extend to any subsequent mergers or acquisitions where there was potential for scale and scope efficiencies. This is illustrated by the fact that trade sales seem to attract a premium relative to floats in asset sales undertaken in Australia to date.

Implicit in ACG's analysis is the assumption that both the regulator and investors will identically specify the cash flows attributable to the regulated assets over time. *This is almost certainly invalid*. Not only can the successful bidder be expected to bring significant efficiency benefits in at the outset, but also all of the firms included in ACG's analysis are subject to what is known as 'incentive regulation' as part of either price or revenue controls.

Under incentive regulation, the regulator predicts cash flows it considers the firm should receive from its regulated business. To encourage improved efficiency over the regulatory period, firms are entitled to keep extra cash flows resulting from out-performing the regulatory benchmarks. This out-performance could take the form of reducing costs to a

greater extent than the regulator predicted or being able to invest the allowed capex in a more efficient manner than expected by the regulator.[22]

The regulatory environment in Australia recognises the presence of information asymmetries to the extent that the regulator cannot be privy to all of the information available to the regulated firm. Consequently regulatory practice recognises that the firm must be induced to improve efficiency by out-performing regulator-set benchmarks, and in so doing, disclose its private knowledge about the efficiency potential of its operations.

It is therefore likely that, under incentive regulation, the net cash outflows expected by a successful purchaser of a business should be lower at each point in time than those assumed by the regulator. Exact correlation between net cash flows expected by investors and those assumed by the regulator would imply that regulators had an unrealistic level of knowledge about the efficiency enhancing opportunities available to the regulated businesses – so much so that rate of return regulation would provide a more appropriate regulatory response.

An informed investor knowing that the firm will be rewarded for cost and efficiency improvements above the regulatory benchmark will expect to retain any extra cash flows earned by the firm for the current review period and for at least much of the next regulatory period.

Investor expectations of the ultimate sharing of the benefits of out-performance may well have been more bullish at the time of asset sales than suggested by subsequent regulatory practice, especially in the early period of the ACG analysis. These investor expectations of both the extent of anticipated out-performance of regulatory benchmarks and the retention of the proceeds from that out-performance would have been capitalised into the price paid for assets.

While it is very difficult to identify exactly what impact expectations of efficiency savings would have had on bidding behaviour, it is clear that providing a binding statement of initial revenues under the Tariff Order together with expectations that any efficiency gains would be returned to users over a relatively long period via a glide path would have provided purchasers with strong incentives to look for efficiency improvements immediately after purchasing the businesses.

An example of how the efficiency glide path worked in practice is provided in the ORG's December 2000 electricity distribution price re-determination where allowance was made for a significant efficiency carryover for ranging from a minimum of $9.0 million for AGL to a maximum of some $88.6 million for Citipower over the period 2001 to 2005 (in 1999

[22] In addition, there is the prospect of selling more energy than expected (if the regulated business operates under a price cap). This issue is addressed in the next section.

dollars).[23] This amount is in addition to the benefit that would have already been captured by these businesses during the previous 5 year regulatory period during which time they retained the full benefit of their out-performance of the efficiency benchmark.

Whilst there was a significant variation in efficiency carryover between the various distributors, it should be noted that this is an *ex post* estimate of efficiency improvements and as such would not necessarily reflect the assessment of investors at the time that they were considering purchase of the then Government owned assets. This is especially the case given that it would have been recognised that such Government businesses would have had to meet a range of Government priorities.

In an attempt to assess the possible magnitude of the impact of this effect on bidding strategy a simple example is constructed from the Victorian electricity distribution privatisation process. This example is based on the assumption that bidders on average believed they could:

- reduce total costs (across capital, operating and maintenance activities) by the equivalent of 5 per cent of revenues upon purchasing the businesses:
- retain 100 per cent of the benefit for the first 5 years and application of a straight glide path over the following 5 years; and
- that the relevant revenues were as specified in the tariff order in terms of prices and volumes by customer class.

Based on these assumptions, the bids could have incorporated efficiency improvements ranging from $28 to $73 million as detailed in the following table.

Table 4 **Impact of an alternative adjustment path on valuations**

	AGL	CP	Pc	TXU	UE
NPV ($m)	28	38	73	58	54

Source: NECG estimates

5.3 Expected growth in asset productivity

Because price caps were the most common form of price control under the Tariff Orders governing the sale processes, the premium that was paid in each case was a function of the demand forecasts of the respective bidders. As the marginal costs of additional sales for these businesses is normally very low, any expected increase in sales growth (whether

[23] ORG Electricity Distribution Price Review Re-Determination, Appendix D

organic or facilitated by the buyer) will have a significant impact on profitability and hence value.

For example, if the profit margin is assessed to be 10 per cent on sales, then an increase in forecast sales of only 10 per cent will double profitability (assuming zero incremental costs associated with the additional sales). Just as the successful bidders is likely to be in a position to introduce improvements in operating efficiency as discussed above, they are likely to be in a position to use the assets more productively. This after all is a key rationale for the sale in the first place. Furthermore, there is considerable scope for the "winners curse" to arise whereby the highest bidder simply adopted the most favourable growth assumptions.

In particular, in arriving at an offer price for a regulated business, an investor must establish forecasts that it believes are achievable given the information available. There is naturally a considerable distribution around these estimates due to the range of potential impacts that will be beyond the control of the business.

For example, in establishing forecasts for future revenues, energy distribution businesses serving large numbers of domestic customers are essentially taking a bet on future weather conditions. Should conditions turn out to be significantly milder than expected then the demand for both heating and cooling will be reduced. Similarly, investors will make assumptions as to the likelihood of attracting new major industrial loads as well as the likelihood of retaining and increasing the existing loads of major customers.

Similarly, the growth in industrial and commercial demand will be critically related to economic growth and also relative energy prices. Indeed, over the last twenty years, the growth in demand for natural gas has consistently lagged the more bullish expectations of industry and indeed, many Government experts.

Once again, the higher purchase prices that flow from the (expected) improvement in asset productivity will translate into higher q ratios as measured by the ACG methodology but not, for the most part, into the marginal q ratios which are relevant for the incentives for new investment.

5.4 Expected regulatory outcomes

A key risk factor faced by all regulated businesses is the likely shape of future regulation. Of course, investors will take into account the fact that there is an element of regulatory risk at the time of the initial bids. This will tend to deflate bids to an extent. However, with the assets in question, any such effect is likely to be dominated by the combination of efforts at the time to minimise at least the perception of regulatory risk. Indeed, subsequent regulatory decisions highlight the biases involved.

In particular, in order to reduce such regulatory risk, it was common for Governments to outline the likely future nature of regulation applying to the business being privatised. Some regulatory guidelines were published for future reviews as part of the Tariff Order while in other instances it may have been as part of confidential discussions with the Government or Regulator.

Such guidance had the potential to make a significant impact on the prices offered for assets. For example, the then Regulator-General in Victoria indicated that future price adjustments would be via a glide path mechanism so as to avoid price shocks. This commitment would no doubt have affected bids. Similarly, the subsequent decision of the then ORG to dismiss this commitment in the subsequent regulatory review would have had a correspondingly adverse impact for the incentives of affected businesses to further invest in the network.

Similarly, businesses have witnessed unforeseeable adverse changes in the regulatory framework. A good example is the changes to the approach taken to the assessment of tax liabilities in regulatory processes where we have seen the widespread adoption of the post-tax nominal regulatory approach in place of the previously universally applied pre-tax real framework. The impact of this change is that regulated businesses have been unable to retain the tax benefits that were incorporated into their original bids.

In addition, it must be remembered that the purchasers of the regulated businesses that formed the ACG sample may well have had expectations at the time of the purchase of a more favourable regulatory environment emerging over time, at least in respect of certain parameters. For example, the regulatory asset bases that were adopted for the ACG analysis assumed that easements for electricity distributors were determined on a historical cost basis. It is quite possible that even assuming an indexed historical cost approach would have added as much as 5 per cent to the regulatory asset base. However, no consideration of such an adjustment was included in the ACG analysis.

5.5 Impact of strategic values

Purchaser's valuations of regulated businesses would, at least in part, have been related to the perceived strategic fit of the available businesses within the broader operations of the firm. Such strategic values may include factors such as geographic or industry sector diversification or changing the mix of growth versus yield assets.[24]

[24] For example, such considerations were cited recently by Alinta in its press release commenting on the purchase of the Duke Energy International assets in Australia (Alinta News Release, 15 March 2004).

5.6 Other factors

There are a number of other factors that are likely to have had a significant impact on purchase prices and therefore estimated q values. For example, it is likely that the initial Victorian privatisations in the mid 1990s captured a premium associated with the focus of many foreign firms on expanding their international operations at a time when not many such assets were being sold. Thus there was brisk competition for the available assets potentially ensuring prices exceeded those that might otherwise have been achieved.

Since this time, we have seen the departure of nearly all of the US firms that originally invested in Australia, with the regulatory environment frequently cited as a major cause for this loss of interest.

6 Reassessment of q values

In its paper, ACG presented individual firm q values as a range of possible values. The need to establish a range of values (as distinct from a single definitive value) arose from the requirement to adjust the market value of the firm to exclude the retail component of the business.

NECG has followed a similar approach recognising the impossibility of establishing a definitive value for each of the factors that is likely to have impacted on the firm's value. As such, NECG has adopted three scenarios, namely a low, medium and high scenario.

The low scenario may be thought of as that which assumes the lowest value for the elements of the business that could justify a premium above the WACC (for example, consistent with ACG's $200/per customer retail valuation).

In contrast, the high scenario may be thought of as that which reflects the upper end of a reasonable range of the possible outcomes that influenced market valuations of the regulated businesses (for example, consistent with ACG's $1000/customer retail valuation).

The medium scenario is intermediate between the low and high scenarios. The high scenario was informed by discussions with successful bidders for the regulated firms as to the magnitude of the parameters that influenced their bids. However, these values do not accord precisely with any bidder's valuation of these parameters.[25]

The major adjustments identified are as follows:

- WACC premium embedded in the original tariff structure;
- tax effects;
- unregulated revenues;
- efficiency improvements;
- asset productivity; and
- one off increase in regulated asset base.

The basis for calculating the magnitude of each of these adjustments is outlined in the following sections. Again, it is recognised that other factors may well have informed and influenced market valuations at various times – the purpose of this illustration is to

[25] The value of all adjustments was calculated in present value terms with the relevant discount rate being the real pre tax WACC of 9.1 per cent in 1995 and 7.5 per cent thereafter as discussed in the next section.

highlight the variation in the possible q values by adopting realistic values for the factors omitted from the ACG analysis.

6.1 WACC Premium[26]

The WACC premium is defined as the margin between the regulated WACC and the true underlying WACC of the firm. Where the regulated WACC exceeded the underlying WACC of the firm, the firm would have taken this into account in establishing its bid for the business. The magnitude of the expected WACC premium is likely to have varied depending when the privatisation occurred and what regulatory precedents existed.

The underlying 'true' pre tax real WACC is assumed to be around 7.5 per cent in recent years with the rate in the mid 1990s being some 170 basis points higher (at around 9.2 per cent) due to variations in the real risk free rate. In making this assumption, it is emphasised that this rate is not endorsed as the appropriate WACC to be applied – it is simply adopted for illustrative purposes.

On this basis, the estimated WACC premium for the Victorian Electricity Distribution (1995) privatisations was around 170 basis points for urban distributors (i.e. 10.9 per cent – rather than 9.2 per cent) with rural distributors gaining an additional 100 basis point premium (this applied to Powercor and TXU).

For the Victorian gas distributors privatised in 1999, it is assumed that the WACC premium was around 25 basis points as indicated by the difference between the base WACC of 7.5 per cent and the regulated WACC of 7.75 per cent. Similarly, the ETSA privatisation in 1999 involved a regulated WACC of 8.3 per cent or a WACC premium of 80 basis points. The remaining transactions were assumed to not be subject to any WACC premium.

The basis for determining the impact of the assumed WACC premia under the three scenarios was:

- the low scenario assumes the premium was only expected to apply for the first regulatory period (5 years) with a subsequent adjustment to prices at the start of the next regulatory period ensuring no on-going benefit;
- the medium scenario assumes the premium applies fully for the initial 5 years and is then progressively removed via a glide path adjustment over next five years; and

[26] The initial privatisation of the Victorian electricity distributors included the requirement for payment of franchise fees. The present value of these fees as estimated by ACG was added back to the market value.

- the high scenario assumes the premium will apply in perpetuity.

Similar issues emerge in the context of the privatisation of the combined Victorian gas distribution and retail businesses, where the initial premium was embedded in retail tariffs which applied to franchise customers. It was assumed that the impact of these high tariffs was to add equivalent value to 10 per cent of the businesses' revenue for each year until full retail contestability came into effect in October 2002.

This is a simplifying assumption on account of the fact that it is likely that there would be a longer term impact to this premium on account of the value of incumbency in the contestable market (i.e. in high expectations of customer inertia in deciding their retailer of choice). The same allowance was included for all scenarios.

6.2 Tax effects

While the impact of tax effects will vary dramatically between firms, a simplified approach was adopted for this analysis with tax benefits proxied by a standard proportion of market value for asset sales up to 2000.[27] The relevant proportion for each of the three scenarios was:

- the low scenario assumes that expected tax benefits amounted to approximately 2.5 per cent of market value at the time of sale;
- the medium scenario assumes that expected tax benefits amounted to approximately 7.5 per cent of market value at the time of sale; and
- the high scenario assumes that expected tax benefits amounted to approximately 12.5 per cent of market value at the time of sale.

For any subsequent business re-sales, it was assumed that there was no expectation of capturing domestic tax benefits due to the move to adopt a post tax nominal regulatory framework. However, potential purchasers would still have expected to capture any foreign tax benefits. These have not been modeled in the analysis.

6.3 Unregulated revenues

The expected benefit associated with unregulated revenues was estimated as a proportion of market value. The relevant proportion for each of the three scenarios was:

- the low scenario assumes that unregulated revenues were expected to amount to approximately 2.5 per cent of market value at the time of sale;

[27] The exception to this approach is with respect to GasNet where actual tax losses provided on a confidential basis were used.

- the medium scenario assumes that expected unregulated revenues were expected to amount to approximately 7.5 per cent of market value at the time of sale; and
- the high scenario assumes that unregulated revenues were expected to amount to approximately 12.5 per cent of market value at the time of sale.

6.4 Efficiency improvements

As discussed in Section 5, it is reasonable to assume that bidders for Government owned assets would have expected to have been able to capture significant immediate efficiency improvements together with smaller ongoing efficiency improvements. Further, the presence of an explicit incentive regulation framework would suggest that firms could be expected to retain a substantial proportion of efficiency improvements.

We have assumed for simplicity that expected efficiency improvements following from initial privatisations were achieved in the first year with benefits subject to a glide path adjustment in the second 5 year period. Efficiency improvements are estimated as a proportion of operating expenditure. Operating expenditure is either sourced from regulatory decisions where available or is assumed to be 40 per cent of total regulated revenue in other instances. Operating expenditure is assumed to remain constant into the future – that is, that operating efficiency improvements are exactly offset by increased operating costs associated with overall growth in demand for services.

The efficiency values adopted in developing its three scenarios were:

- the low scenario assumes a 2.5 per cent reduction in operating costs in year 1 of the first regulatory period the subject of the Tariff Order with efficiency improvements of 0.5 per cent per annum from year 6 on;
- the medium scenario assumes a 5 per cent reduction in operating costs in year 1 of the first regulatory period the subject of the Tariff Order with efficiency improvements of 0.5 per cent per annum from year 6 on; and
- the high scenario assumes a 10 per cent reduction in operating costs in year 1 of the first regulatory period the subject of the Tariff Order with efficiency improvements of 0.5 per cent per annum from year 6 on.

6.5 Asset productivity

Asset productivity refers to the benefit of increased utilisation of existing assets in the form of bidder's expectations of sales growth exceeding those assumptions embedded in the initial Tariff Order. The impact of this factor was estimated as a proportion of opening revenue as at each regulatory period – that is forecast demand for tariff setting purposes

would be reset to actual demand at the start of each regulatory period limiting the benefit to the out performance during each regulatory period. The proportion is assumed to be:

- the low scenario assumes that there was no expectation of an asset productivity benefit;
- the medium scenario assumes that the expected asset productivity benefit was 1 per cent per annum for the first 5 years, then 0.5 per cent each year thereafter; and
- the high scenario assumes that the expected asset productivity benefit was 2 per cent per annum for the first 5 years, then 1 per cent each year thereafter.

6.6 One off increase in regulated asset base

The allowance for a one off increase in the regulated asset base is associated with the expectation that easements would be included within the regulated asset base. The impact of doing so was separated between electricity and gas businesses due to the larger impact that easements have on electricity businesses. The value of easements included for each scenario was established as a proportion of the regulated asset value as follows:

- the low scenario assumes that there was no expectation of the inclusion of the value of easements within the regulated asset base;
- the medium scenario assumes that the value of easements expected to be included in the regulated asset base for electricity businesses was 3 per cent of the existing regulated asset value while for gas businesses the equivalent value was assumed to be 1 per cent; and
- the high scenario assumes that the value of easements expected to be included in the regulated asset base for electricity businesses was 5 per cent of the existing regulated asset value while for gas businesses the equivalent value was assumed to be 2 per cent.

6.7 Summary

The aggregate impact of the above factors is summarised in the following table. This table uses the ACG maximum q based on a $200/customer retail value together with NECG's low, medium and high scenario outcomes. To reiterate, the assumptions adopted are either based on a realistic assessment of information provided by regulated companies or, where suitable evidence is not available, a conservative assessment of the dimensions of the factor involved.

Table 5 **Sensitivity of measured q ratios**

Firm	ACG Q	Low	Med	High
Solaris (AGL - Sept 95)	2.0	2.1	1.6	1.0
CitiPower (Sept 95)	2.3	2.3	1.9	1.3
Eastern Energy (TXU - Sept 95)	2.2	2.3	1.7	1.1
Powercor (Sept 95)	1.8	1.6	1.1	0.5
United Energy (Jun 95)	1.5	1.7	1.2	0.7
ETSA (December 99)	1.5	1.4	1.1	0.9
Westar (TXU - Jan 99)	2.4	2.2	1.7	1.1
Multinet (Mar 99)	2.5	2.3	1.7	1.1
Stratus (Envestra - Mar 99)	1.9	1.7	1.4	1.1
GPU Gasnet (May 99)	2.0	1.6	1.4	1.3
Alinta Gas (Nov 00)	1.5	1.4	0.9	0.4
CitiPower (AEP - Nov 98)	2.4	2.2	1.7	1.1
Powercor (CKI/HEI - Sep 2000)	1.4	1.3	1.2	1.0
CitiPower (CKI/HEI - Sep 2000)	1.6	1.5	1.4	1.2
GasNet (IPO Dec 2001)	1.6	1.1	1.0	0.8

Source: ACG and NECG estimates

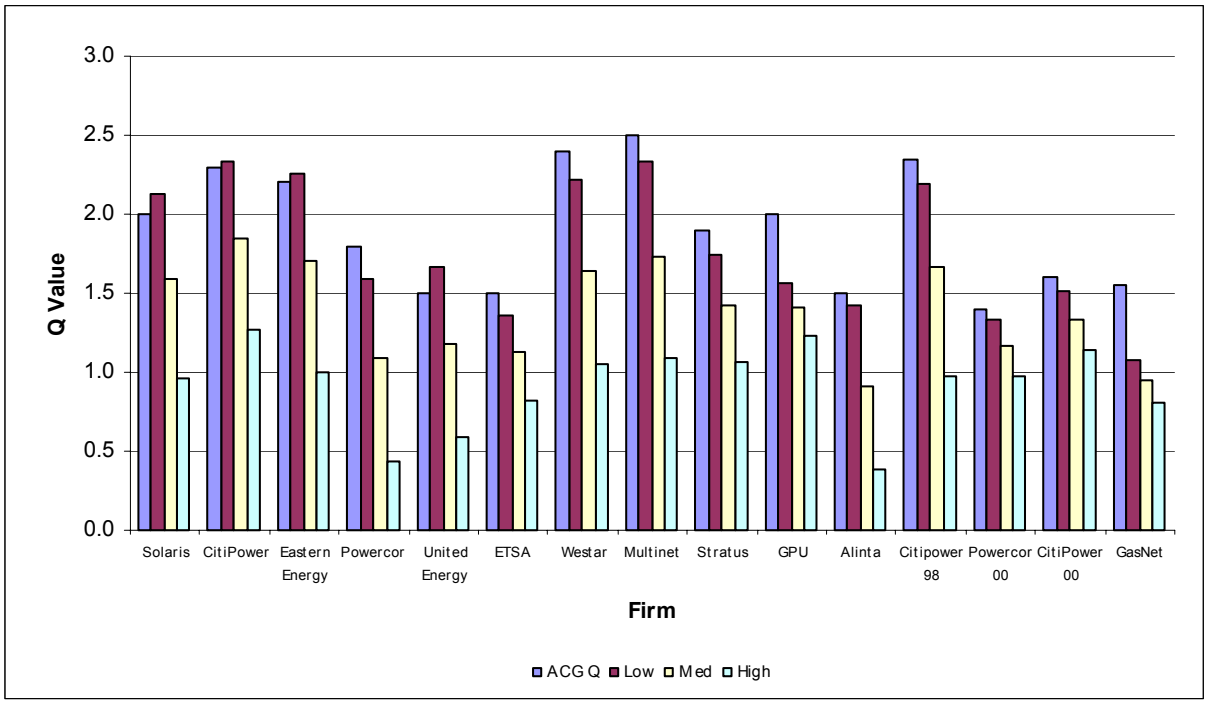
Two messages can be gleaned from this table. First, the table clearly indicates that a very wide range of q values is quite possible when adjustments are included to reflect assumptions concerning the factors likely to be considered by a firm in developing a bid.

Secondly, ACG's assertion that regulators were providing a rate of return to the relevant entities that exceeds the cost of capital does not stand up to closer examination. In particular, by attempting to quantify *just some* of the biases in the ACG methodology that have been discussed in earlier sections, it becomes evident that q ratios close to 1 become the norm. It is interesting to note that the q ratios in the final two columns in the above table tend to be lower than those observed for listed companies in the ASX – see Section 8.3 below.[28]

[28] It should be stressed that the q ratio for listed securities are estimated on a different basis to the regulatory q ratios here.

This information in the above table is replicated in the following chart.

Chart 3 **Sensitivity of measured q ratios**



Source: ACG and NECG estimates

7 The relevance of regulatory risk to the marginal q

Having established that considerable caution is required in interpreting the average q ratios we turn now to the critical consideration of rates of return and investment incentives. In general, incentives to invest will be driven by *expected* returns over the life of the investment.

For the businesses under consideration, it was accepted in the literature from the time that the q ratios were first developed that marginal q ratios will be lower than average q ratios (see discussion in Section 3.2). This is not contentious.

It is more difficult to determine the scale of the difference between the measures. The discussion in Section 5, and some of the adjustments in Section 6, can be seen as providing a *partial* adjustment to the average q ratios to move closer to a marginal q (which is the relevant ratio for decisions on new investment).

In other words, much of the additional revenue available to a purchaser of a regulated business from existing assets is unlikely to be available for new investments.

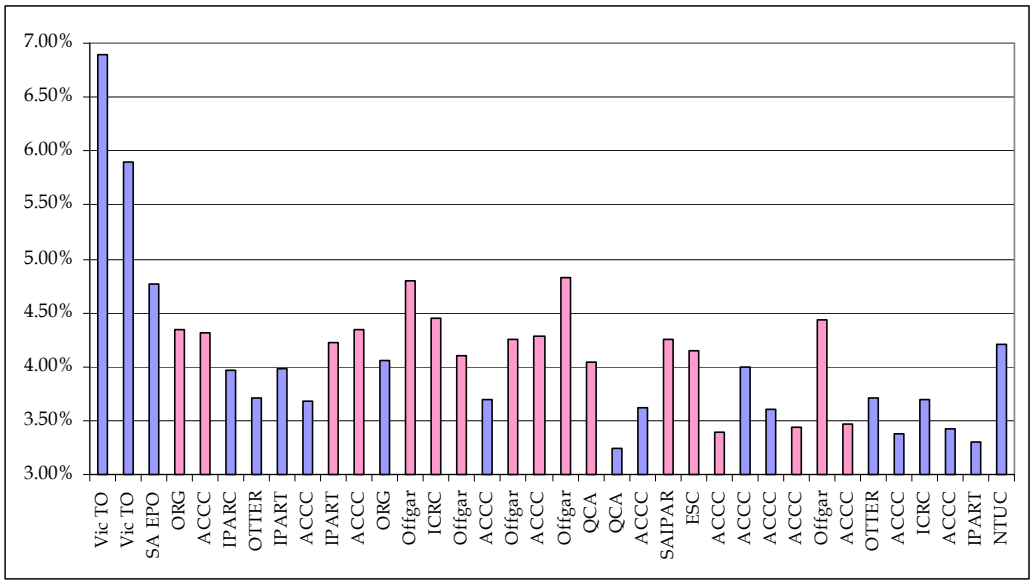
For example the opportunity for a regulated business to derive unregulated revenues from its regulated assets arises principally in relation to the existence of a *network* rather than additions to it. Similarly, the opportunity to earn additional revenue from unregulated activities associated with the skills and expertise of the organisation is unlikely to be enhanced by incremental regulated investment.

In addition, there is unlikely to be any scope for benefits from future regulatory rulings (such as easements) for new assets. There are also unlikely to be opportunities to significantly enhance branding values or other strategic values from these investments.

The availability of efficiency savings by their nature tends to apply to those assets that require relatively intensive maintenance (rather than new infrastructure). The tax opportunities and favourable tariff rulings apply to the existing stock of assets rather than new infrastructure, especially given changes in the allowed rate of return over time.

Over and above these considerations, uncertainty over the regulatory environment can impinge on incentives for new investment. To illustrate, Chart 4 sets out the range of allowed rates of return for energy regulatory decisions since 1995 in pre-tax terms after deducting the prevailing real risk free rate at the time of the decision (gas decisions are depicted in pink). The reason for presenting these WACCs in pre-tax real terms arises from the way in which the WACC was applied at the time of most of the asset sales examined here.

Chart 4 **Pre-tax real regulatory returns 1995-2003**



Source: Various regulatory decisions

Given that investment incentives will be influenced by expected outcomes from future regulatory processes, it is therefore relevant to consider how those expectations may be influenced by the experience that has occurred to date. Over the period in which regulation has been applied in Australia, we have seen many changes to the way in which the WACC is calculated and applied.

The rates of return outlined in Chart 4 suggest that over the relevant period rates of return have declined by between 50 and 75 basis points in real pre-tax terms since late 2000 (i.e. virtually all of the trade sales that formed the ACG sample occurred before this reduction occurred).[29] In actual fact, this effect is larger than suggested in the figure on account of a statutory rate being assumed for transforming post-tax WACCs into pre-tax terms when the effective tax rate was not disclosed in the regulatory decision.[30]

There is however a further issue of substance that goes beyond the mere reduction in regulatory WACCs, significant as it is. The adverse impacts on investment in the reductions that have already occurred are magnified by the uncertainty that naturally arises from these changes.

This uncertainty is all the more problematic to the extent that regulators continue to argue that regulatory WACCs are on the high side in the context of their decisions on rates of

[29] It is acknowledged that values of listed assets are also affected by this uncertainty.

[30] Historically, accelerated depreciation has meant that effective tax rates have been below statutory tax rates.

return. This *must* create uncertainty that adversely affects future investment decision-making by regulated infrastructure owners.

This uncertainty also affects how additional revenue associated with new investment in, say, network expansions might be treated in future regulatory reviews. For example, the additional revenue that might be able to be earned from telecommunications services might provide a further stream of revenue but the valuation of these benefits would have to be discounted on account of the uncertainty in the future regulatory treatment of such revenues. The unregulated revenue that might be earned from a new investment will only be relevant to the extent that the owner of the regulated business had confidence in securing those additional benefits over the life of the investment.

Finally, the impact of uncertainty becomes of greater significance when regard is had to the uncertainty of the regulatory environment. It is noted that the Productivity Commission has already commented on the inability of the current regulatory environment to accommodate the uncertainties facing risky new investment. Average q ratios based on existing assets with a history of return do not inform an assessment of the sufficiency of a return for a new asset that carriers with it substantial risk. In other words, irrespective of the precise level of the average q, a key issue is how the regulatory environment accommodates this uncertainty if it is to avoid distorting new investment.

Accordingly, even if the average q for existing infrastructure investments is more than one (a view that is disputed on the basis of the analysis contained in this report), it is by no means clear that this translates into a marginal q of one or greater, especially given the impact of uncertainty on new investment in a regulatory environment.

8 Other concerns with ACG approach

8.1 Impact of stock market volatility on q ratios

The q ratios as set out by ACG are sensitive to stock price volatility. On examination of two Australian listed companies included in ACG analysis[31] which exclude any significant retail activity, Envestra and GasNet, it is clear that there is a high degree of annual volatility in their stock prices. The table below outlines the degree of stock price volatility over a 52 week period.

Table 6 **Stock price volatility over a 52 week period**

Company	Number of Shares/Units on Issue at 16/03/04[32]	52 Week Stock Prices (Period ending 20 March 2004) [33]			Volatility[34]
		High ($)	Low ($)	Midpt. ($)	
Envestra Ltd (ENV)	727,459,291	1.12	0.96	1.04	15%
GasNet Australia Trust (GAS)	140,112,000	2.41	1.96	2.19	21%

Source: ACG and NECG estimates

The following table demonstrate how this high volatility in stock prices translates into volatile equity values, and thus unstable q ratios.

[31] The remaining firms are owned by overseas domiciled firms with the Australian assets representing a limited proportion of their total assets.

[32] Source: http://www.tradingroom.com.au/

[33] Australian Financial Review, 6 November 2003.

[34] Calculated as (High – Low)/Midpoint

Table 7 **Unstable q ratios**

Company		Envestra Ltd	GasNet
ICB ($000)		1,452,750[35]	494,200[36]
Debt ($000)		1,868,662[37]	420,252 [38]
Equity (over 52 week period ending 5 November 2003) [39]	High	814,754	781,398
	Low	647,439	601,038
	Midpt.	731,097	691,218
q Ratio (over 52 week period ending 5 November 2003)	High	1.85	1.22
	Low	1.73	1.07
	Midpt.	1.79	1.14
q Ratio Volatility: (High – Low)/Midpt.		6.44%	13.25%

As this table shows, stock price volatility leads to a significant degree of volatility in the q ratios, even over a comparatively brief 12 month period. Over a longer period of time, greater variability in the calculated q ratio should be expected because the absolute price range for each firm's shares increases with time.

Certainly a one year period would not be sufficient to experience the full range of possible price volatility as many infrastructure investors have been in favour with investors in recent years due to their defensive nature (high yield stocks are particularly attractive during periods of low earnings growth – a situation which prevailed over much of the period of the ACG analysis). Again, this highlights the need for caution to be applied to outcomes of this analysis and the need for it to be considered in the context of a lengthy period after considerable regulatory precedent emerged.

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[35] Essential Services Commission of South Australia, *Final Decision - Access Arrangement of Envestra Limited's South Australian Natural Gas Distribution System*, December 2001; Essential Services Commission of Victoria, *Final Decision - Review of Gas Access Arrangements*, October 2002, page 139; Envestra Limited, *Access Arrangement Information for the Mildura Pipeline*, 11 November 1999 page 20; Envestra Limited, *Access Arrangement Information for the Riverlands Pipeline*, page 10.

[36] ACCC, Final Decision, *Final Approval, GasNet Australia Access Arrangement Revisions*, 17 January 2003, page 8

[37] Envestra Ltd, *Annual Report 2003*, page. 29

[38] GasNet Australia Trust, *Annual Report 2002*, page 33

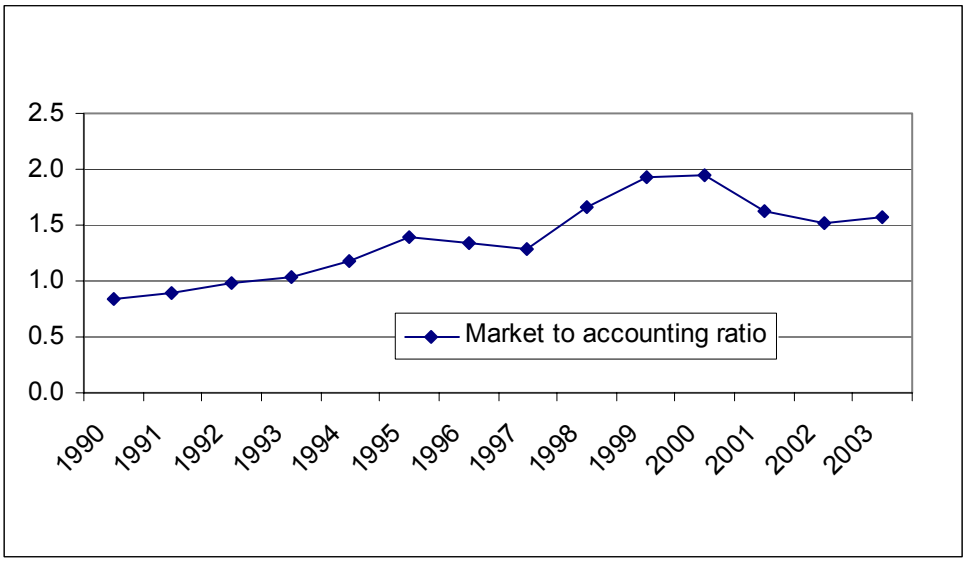
[39] Calculated as: Number of Shares/Units on Issue at 12/11/03 x 52 Week Stock Prices.

8.2 Comparison with wider stock market measures

Between 1996 and 2003, listed companies in Australia were required to revalue assets on the basis of their market values (refer ASX listing rules and AASB 1041). One might expect under such a regime that the ratio of market value to net assets for these companies would be around 1 whilst such a requirement was in place.

Figure 5 illustrates this ratio for the top 25 Australian listed companies over this period (excluding banks and property trusts). It shows that the ratios of market to accounting values over this period were between 1.5 and 2. This is despite the fact that these entities operated in highly competitive domestic and international markets.

Chart 5 **Comparison of accounting assets to market values**



Source: Bloomberg

Whilst this is a very different exercise to the regulatory asset valuation process, it does serve to highlight both the volatility in these measures over time and the caution that must be applied in interpreting them.

8.3 Alinta error

A further, more elementary error of omission is apparent on a careful reading of ACG's appendix. The q ratio calculated by ACG for Alinta makes use of a market valuation which includes an unregulated contract between Alinta and Wesfarmers for the supply of LPG. ACG acknowledges the importance of that contract to the company's performance[40]

[40] Ibid, Pg. 79

and an indication of the magnitude of the effect of the contract is provided by Alinta's comment[41]:

> AlintaGas Sales reported a 6.6 per cent decline in sales revenue and an 18.2 per cent decline in EBITDA from the previous year. The primary cause of this overall decrease was a significant drop in average LPG prices in 2002 compared to the previous year and a reduction in gross margins on contestable customer classes. Excluding the impact of LPG prices, on the Wesfarmers LPG contract, the Retail Sales business was able to improve EBITDA by 32.4 per cent as a result of restructuring activities and aggressive cost management in 2001.

Thus the fact that ACG did not seek to exclude the value of the LPG contract in estimating the market value of the regulated business (the numerator used in calculating the q ratio), while nevertheless excluding this contract from the denominator (representing only the regulated assets) is likely to significantly overstate the actual q ratio.

The ACG summarises its empirical results thus:

> "From the information presented above, it is clear that the market value of the regulated activities has exceeded the regulatory value almost universally. It is also clear that the market values have typically exceeded the regulatory values by a substantial margin. Of the transactions or listed entities covered, the only ones for which the market-to-regulatory value was close to unity were for United Energy and AlintaGas, but only if a high value for their retail activities is assumed."[42]

ACG's own calculation put the q ratio for AlintaGas at between 0.8 and 1.0 at four separate points in time. The most common value was 0.9. These values used the 'benchmark' valuation for the associated retail business of $878/customer.[43] This benchmark valuation for the retail business was derived from the single data point which ACG had for a gas retail business. To say, as they do, that this is at the high end of the range is absurd: there is only one point in the range. It is only a 'high value' relative to valuations for electricity retail businesses. A careful reading of the endnotes reveals a further source of upward bias in ACG's q estimate for AlintaGas:

> "When interpreting these results, the following should be noted. The value to AlintaGas of the LPG contract has not been excluded (explicitly) from the value of the entity."44

In other words, ACG's q estimate for Alinta, low as it is, has failed to adjust for the fact that the market valuation includes the value of an unregulated LPG contract. Clearly, making this adjustment would reduce the q ratio for Alinta even further.

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41 Alinta Concise Annual Report 2002, pg 14.

42 ACG report, p. 59.

43 At December 1998, adjusted for inflation for other dates.

44 ACG report, p. 80.

If we focus on gas utilities, the Alinta result is statistically significant. ACG has selected a group of only six gas firms, pointedly omitting the two pipelines (DBNGP, and MSP) for which the issue of regulatory takings has been most hotly debated. Even within this specially selected group, one in six examples runs contrary to the claim.

9 Conclusions

Investors will be prepared to pay more for an asset than it is valued in the hands of existing owners if they expect to be able to generate more value from the assets. In the case of businesses that were previously in public hands, there will be strong reasons why the purchaser will judge this to be the case. For example, in new hands without non-commercial objectives to be met, significant efficiency gains and a more productive use of assets can be expected.

Simply because a purchaser is prepared to pay more than the regulatory value does not mean that the regulatory environment under which the new asset will be subject is too generous. Rather, the best policy outcome will be one where both efficiency and related gains from the change in ownership are delivered while ensuring that incentives for new investment are appropriate. The measured q ratio (for existing assets) provides a biased estimate for the marginal q that is relevant for incentives for new investments.

Furthermore, for a variety of reasons, the expectations of the bidders of the assets in the ACG sample appear, in many instances, to have been overly optimistic. In part, this may have been the market at work. John Maynard Keynes warned of the role of animal spirits in commercial endeavour, when he suggested that:[45]

> Even apart from the instability due to speculation, there is the instability due to the characteristic of human nature that a large proportion of our positive activities depend on spontaneous optimism rather than mathematical expectations, whether moral or hedonistic or economic. Most, probably, of our decisions to do something positive, the full consequences of which will be drawn out over many days to come, can only be taken as the result of animal spirits - a spontaneous urge to action rather than inaction, and not as the outcome of a weighted average of quantitative benefits multiplied by quantitative probabilities.

This passage may well be appropriate to the speculation that occurs in the context of major asset sales. However, the premia that may be extracted by vendors in these processes are, in an economic sense, largely transfers that have little to do with changes in economic activity. Indeed, in practice, it is the far more mundane issues of new investment in infrastructure that drives economic activity in Australia.

However, the reality is that several of these purchasers have already left the Australian infrastructure market, having suffered significant losses on the subsequent sales of their assets. The unfulfilled expectations of a light handed regulatory environment, including, for example, in relation to falling returns, unfulfilled commitments by regulators and the like, have been a major contributor to these commercial decisions.

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[45] Keynes JM (1936) The General Theory of Employment, Interest, and Money, p 161-62.

It must be remembered however that these unfulfilled expectations have had many causes, including assumptions about the impact of the heavier handed regulation that has emerged over time, the fact that forecasts of what value could be added to the businesses may have been more bullish than subsequently realised, and to other factors, such as weather, that were completely beyond the control of the businesses.

However, the key point about these outcomes is that there is *no* necessary relationship between the ACG ascribed q ratios from the asset sales and the sufficiency or otherwise of regulated rates of return for the purposes of encouraging socially desirable new investment. The dynamics of asset sales processes focuses on how potential buyers may be able to generate additional cash flows - and this exercise focuses on the existing asset base and unregulated opportunities rather than new regulated assets.

This is all the more so given that the uncertainties that prevail in the context of new investment (both in terms of commercial uncertainty and the way that it is affected by regulatory uncertainty).

Indeed, the key statistic that provides an indication of whether or not regulatory rates of return are sufficient, considered in the context of the regulatory regime as a whole, is the regulated status of new investment that is occurring. For example, around 98 per cent of the new investment in gas transmission pipelines since the introduction of the Gas Code has been in assets which the investor expects will never be subject to regulation. Indeed, the only new regulated gas transmission pipeline built in this period was underpinned by explicit Government assistance. This is hardly an outcome one would expect in an environment in which regulated charges were overcompensating owners of regulated infrastructure.

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