GOLDFIELDS GAS PIPELINE

Submission to Economic Regulation Authority Consultation Paper:

Guidelines for the Rate of Return for Gas Transmission and Distribution Networks

28 February 2013

Contents

Executive summary

While this submission makes a number of comments related to the application of the *National Gas Law* and *National Gas Rules*, there are a number of key messages that the regulator must keep in mind in reaching any assessment of the Allowed Rate of Return applicable to regulated businesses:

- Businesses must compete for capital in the open marketplace.
- Businesses within a larger corporate group must compete for access to capital within the larger corporate group.
- If the regulatory Allowed Rate of Return is set too low, the regulated business will not be able to secure funds for extension or expansion of the facilities.
- This will cause a chilling effect on investment in infrastructure assets, and a consequential chilling of investment in other sectors of the economy that rely on access to that infrastructure.
- This chilling effect will be driven not by the business choosing not to invest capital, but by its inability to raise capital in the marketplace to fund investment.
- The focus of the Rate of Return Guidelines must therefore be squarely on the cost of capital commensurate with the cost of funds in the marketplace.
- GGT's reviews of the recent Western Power, ATCO Gas and Dampier-Bunbury decisions indicate that the ERA consistently delivers Rate of Return decisions that, while not in error in the context of the *National Gas Law*, are clearly too low to allow the regulated business to compete for capital in the marketplace.
- It is GGT's view that a focus on process rather than outcomes has the potential to deliver uncompetitive returns to allow infrastructure development, and will therefore ultimately have a broader chilling effect on investment in the state.

GGT acknowledges the Consultation Paper issued by the Authority, and the structure that paper lends to the discussion surrounding the formation of the Rate of Return Guidelines. However, GGT considers that the following submission represents an appropriate distillation of the key issues from an industry perspective. We would be pleased to engage with the Authority at a more detailed level over the course of the consultation period.

1 Introduction

Goldfields Gas Transmission (GGT) welcomes the opportunity to comment on the Economic Regulation Authority's Consultation Paper, *Guidelines for the Rate of Return for Gas Transmission and Distribution Networks*.

GGT notes that the new *National Gas Rules* require an approach to measuring the Allowed Rate of Return in a manner that differs from the ERA's current process, and would value the opportunity to work cooperatively with the Authority to develop sensible Guidelines to guide this process.

GGT also participated in the development of the submission prepared by the Australian Pipeline Industry Association (APIA), which has been filed with the Authority under separate cover.

GGT would value the opportunity to discuss these comments with the Authority.

1.1 The previous National Gas Rules

In its Rule Determination, the AEMC observed that a simple formulaic approach to rate of return determination had been set out in Chapter 6A of the National Electricity Rules (NER), while a more flexible framework had been included in the national Gas Rules (NGR).[1]

The original rate of return framework of the NGR, the AEMC contended, had been better aligned with achieving the national gas objective (NGO) of section 23 of the National Gas Law (NGL) and the revenue and pricing principles (RPP) of section 24. This was not because rule 87(2) prescribed a superior estimation process; it was because rule 87(1) specified an overall objective for the rate of return that directly aligned with achieving the NGO and the RPP.

However, in its Rule Determination, the AEMC observed that the greater flexibility available in the framework of the NGR had not been used by regulators. Rate of return decision making under the NGR had become infected by the inflexible approach of Chapter 6A of the NER, and that had been reinforced by recent decisions by the Australian Competition Tribunal (ACT). The ACT had interpreted rule 87 in a way that reduced the range of information which could be taken into account in determining the rate of return.[2]

1.1.1 Findings of the Australian Competition Tribunal

In its decisions in *WA Gas Networks* and *DBP*, the ACT had rejected the applicants' contentions that giving primacy to rule 87(1) of the NGR would achieve the

[1] Australian Energy Market Commission, *Rule Determination, National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, National Gas Amendment (Price and Revenue Regulation of Gas Services) Rule 2012*, 29 November 2012 (AEMC, Rule Determination), p41.
[2] AEMC Rule Determination p41.

requirements of the NGO and the RPP.[3] The ACT concluded that, although rule 87(1) set out the objective for rate of return determination, it did not provide guidance on how that objective was to be achieved. The ACT concluded that, in the interests of regulatory consistency, such guidance should be provided, and that it was provided by rule 87(2). In these circumstances, the ACT reasoned that criticisms of the approach which the regulator had taken to applying rule 87(2), and the financial models used with that approach, were misplaced especially if the approach and model were well accepted.

This was not, the AEMC advised, its view of the way in which rate of return determination should be approached.[4] The AEMC was of the view that rate of return determination should focus on producing an overall rate of return which was consistent with the objectives of the regulatory regime. The interpretation which had been provided by the ACT in *WA Gas Networks* and *DBP* meant that the AEMC could not be confident that, without amendment, the NGR framework would provide rates of return which best met the NGO and RPP.

This was a key driver in the design of the new *National Gas Rules*.

1.2 The AEMC Final Determination

According to the AEMC, there was a need to bring the focus of rate of return determination in the NER and the NGR back to the NEO, the NGO and the RPP. To this end, the AEMC has included an overall objective for the allowed rate of return in rule 87.[5] By including the allowed rate of return objective of rule 87(3), the AEMC intended that the regulators and the appeal body focus on whether the overall estimate of the rate of return met the objective for the allowed rate of return, which was closely linked to the NEO, the NGO and the RPP.[6]

The AEMC was of the view that any relevant evidence, including that from a range of financial models, should be considered in determining whether the overall rate of return objective was satisfied.[7] Requiring the regulator to have regard to relevant information on estimation methods, financial models, market data and other evidence, and allowing the regulator greater scope to achieve an overall rate of return objective, combined with a strengthened requirement to achieve that objective, was more likely to achieve the NEO and the NGO than the current approaches to rate of return determination.[8]

Whether a particular estimate of the rate satisfied the allowed rate of return objective would, the AEMC recognised, invariably require some level of judgement. The exercise of this judgement was to be made with reference to all relevant financial

[3] *Application by WA Gas Networks Pty Ltd (No 3) [2012]* ACompT 12 (*WA Gas Networks*), and *Application by DBNGP (WA) Transmission Pty Ltd (No 3) [2012]* ACompT 14 (*DBP)* .
[4] AEMC Rule Determination, p42.
[5] AEMC Rule Determination p43.
[6] AEMC Rule Determination p38.
[7] AEMC Rule Determination p47.
[8] AEMC Rule Determination p49.

models, estimation methods, market data and other evidence that could reasonably be expected to inform the regulator's decision.[9]

1.3 The new National Gas Rules

The rule change which came into effect on 29 November 2012 is a major change. Rule 87 previously comprised just two subrules. Rate of return determination is now governed by some 19 subrules (and two new related rules, 9B, the rate of return consultative procedure, and 87A, which requires estimation of the cost of corporate income tax consistent with the rate of return measure adopted in rule 87).

More importantly, rule 87 now requires an approach to rate of return determination which is different from the approach previously taken by both service providers and regulators. The new rule recognises that rate of return determination cannot be reduced to "application of a formula". It calls for examination of the evidence from relevant financial models and estimation methods, and from financial markets, and for the weighing of that evidence to arrive at a rate of return which meets an explicit allowed rate of return objective.

1.4 The overall rate of return

GGT considers that the Allowed Rate of Return is of critical importance in signalling the cost of new investment.

Businesses must compete for capital in the open marketplace. Similarly, individual businesses operating as part of a larger corporate group must compete for capital within the context of the broader business portfolio.

If the regulatory allowance for the cost of capital is insufficient, then either

- the business will not be able to attract capital from the market to fund efficient extension or capacity expansion, or
- the business will not be able to compete for capital internally in order to finance prudent and efficient extension or expansion.

This is explicitly recognised under the Rules for determining the cost of equity:

> (7) In estimating the return on equity under subrule (6), regard must be had to the prevailing conditions in the market for equity funds.

and on the cost of debt:

> (11) In estimating the return on debt under subrule (8), regard must be had to the following factors: …
>
> (c) the incentives that the return on debt may provide in relation to capital expenditure over the *access arrangement period*, including as to the timing of any capital expenditure;

[9] AEMC Rule Determination p67.

Importantly for the Authority, to the extent that the Allowed Rate of Return emanating from WA regulatory decisions is lower than the Allowed Rate of Return applicable to assets in the eastern states, WA businesses will be unable to attract capital for extension or expansion. The outcome would necessarily be a chilling effect on investment in infrastructure assets, and a consequential chilling effect on investment in other sectors of the WA economy relying on access to that infrastructure.

2 The Allowed Rate of Return Objective

A key feature of the new Rule 87 is the Allowed Rate of Return Objective:

(2) The *allowed rate of return* is to be determined such that it achieves the *allowed rate of return objective*. …

(3) The *allowed rate of return objective* is that the rate of return for a service provider is to be commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the service provider in respect of the provision of reference services (the *allowed rate of return objective*).

The Allowed Rate of Return Objective now makes it clear that it is the *outcome* of the regulator's analysis that is of primary importance rather than the values of various input components to a single financial model.

The importance of this objective cannot be overstated. When securing finance in the open marketplace, it is the outturn cost of capital that is important, not the reasonableness of the individual parameters that guided the regulator's decision in reaching a particular allowed rate of return.

2.1 Having regard to a wide range of information

The ACT concluded in *WA Gas Networks* and *DBP* that a single model, by itself, could achieve all that was required by the rate of return objective of rule 87(1). However, the AEMC concluded that this is not the case: rate of return determination could not be reduced to a simple formulaic approach.

Critically, a simple formulaic approach, the AEMC maintained, did not inquire into whether the overall rate of return produced could best achieve the National Electricity Objective (NEO), the NGO and the Revenue and Pricing Principles (RPP).[10] A framework relying on a relatively mechanistic approach was not well placed to achieve the NEO, the NGO and the RPP.[11]

The result of the AEMC's reasoning in this regard is the clear focus of the new Rule 87 - the Rate of Return Objective, as discussed above.

Rule 87(5) also makes it abundantly clear that in reaching a decision on the rate of return in satisfaction of the Allowed Rate of Return Objective, the regulator must have regard to a wide range of relevant information:

(5) In determining the *allowed rate of return*, regard must be had to:

(a) relevant estimation methods, financial models, market data and other evidence;

(b) the desirability of using an approach that leads to the consistent application of any estimates of financial parameters that are relevant to

[10] Section 7A of the *National Electricity Law* (NEL) sets out revenue and pricing principles very similar to those of section 24 of the NGL.
[11] AEMC Rule Determination, p57.

the estimates of, and that are common to, the return on equity and the return on debt; and

(c) any interrelationships between estimates of financial parameters that are relevant to the estimates of the return on equity and the return on debt.

2.2 The Authority's Consultation Paper

In light of the Rule requirement to have regard to a wide range of information as discussed above, GGT is concerned that the Authority's Consultation Paper is very "CAPM-centric", discussing in some detail particular parameters of the CAPM.

While acknowledging the historical use of the CAPM, GGT notes that a key purpose of the new Rule 87 is to explicitly require the regulator to have regard to a wide range of relevant estimation methods, financial models, market data and other evidence. The role of the Guideline now required by rule 87(13) is to set out those methodologies, models and other evidence to which the regulator will have regard in informing the exercise of its judgement:[12]

> (14) The rate of return guidelines must set out:
>
> (a) the methodologies that the AER proposes to use in estimating the *allowed rate of return*, including how those methodologies are proposed to result in the determination of a return on equity and a return on debt in a way that is consistent with the *allowed rate of return objective*; and
>
> (b) the estimation methods, financial models, market data and other evidence the AER proposes to take into account in estimating the return on equity, the return on debt and the value of imputation credits referred to in rule 87A.

Yet the Authority's Consultation Paper devotes only one question (of a total of 59) to the matter of what other relevant estimation methods, financial models, market data and other evidence should be considered.

GGT is concerned that this focus in the Consultation Paper may signal an intention by the Authority to continue to apply a single model (the SL-CAPM) in determining the Allowed Rate of Return. In GGT's view, such an approach undermine the Authority's efforts to determine a rate of return commensurate with the cost of capital in the marketplace, and moreover would be in contravention of the Rules.

GGT considers that it is premature at this stage of the Guideline development process to delve into the detail of how particular SL-CAPM parameters might be estimated before first determining the role the CAPM will play in the overall Allowed Rate of Return determination process.

As a matter of priority, GGT seeks the Authority's assurance that it will, in accordance with the Rules, have genuine regard to a range of estimation methods,

[12] AEMC Rule Determination p46.

financial models, market data and other evidence in estimating the return on equity, the return on debt and the value of imputation credits.

2.3 Relevant estimation methods, financial models, market data and other evidence

GGT participated in the development of the submission of the Australian Pipeline Industry Association (APIA) to the AER's parallel guideline development consultation process. That submission, which APIA has filed with the Authority under separate cover, includes a report by The Brattle Group and a cover note by Professor Stewart C Meyers of the Massachusetts Institute of Technology.

Consistent with the APIA submission, GGT is firmly of the view that no individual cost of equity model can meet the allowable rate of return objective.

The attached report from The Brattle Group and the covering note by Professor Stewart Meyers are unequivocal on this point:[13]

> It is useful to recognize explicitly at the outset that models are imperfect. All are simplifications of reality, and this is especially true of financial models. Simplification, however, is also what makes them useful. By filtering out various complexities, a model can illuminate the underlying relationships and structures that are otherwise obscured. After all, while a perfect scale model representation of the city might be highly accurate, it would make a poor road map. It is therefore imperative that regulators and other users of the models use sound judgment when implementing and using the models - - there is no one model or set of models that are perfect.

On the question of what individual cost of equity model best meets the allowed rate of return objective, The Brattle Group concluded:[14]

> The gap between financial models and reality can sometimes be quite significant (as was painfully demonstrated by the recent financial crisis). There is no single, widely accepted, best pricing model to estimate the cost of capital – just as there is still no consensus on some fundamental issues, such as the degree to which markets are efficient. Analysts have a host of potential models at their disposal, and it must be acknowledged that cost of capital estimation continues to be part art. Several regulators as well as textbooks therefore recommend that the "best practice" is to look at a totality of information from alternative methodologies.
>
> Academics, practitioners and regulators have all acknowledged that there is no one way to determine the cost of equity. In the academic literature, several

[13] Brattle Group report p8.

[14] See, for example, the Ontario Energy Board's EB-2009-084 decision, December 2009, the U.S. Surface Transportation Board's Ex. Parte 664 (Sub-No. 1) decision, January 2009, and Roger A. Morin, New Regulatory Finance, Public Utilities Report Inc., 2006, Chapter 15.

prominent researchers have commented that the use of more than one method is important. For example, Professor Myers commented:[15]

> Use more than one model when you can. Because estimating the opportunity cost of capital is difficult, only a fool throws away useful information. That means you should not use any one model or measure mechanically or exclusively. Beta is helpful as one tool in a kit, to be used in parallel with DCF models or other techniques for interpreting capital market data.

Professors Berk and DeMarzo of Stanford University in their corporate finance textbook comment on the use of the CAPM, DDM, and other models by practitioners, and state:[16]

> In short, there is no clear answer to the question of which technique is used to measure risk in practice — it very much depends on the organization and the sector. It is not difficult to see why there is so little consensus in practice about which technique to use. All the techniques we covered are imprecise. Financial economics has not yet reached the point where we can provide a theory of expected returns that gives a precise estimate of the cost of capital. Consider, too, that all techniques are not equally simple to implement. Because the trade-off between simplicity and precision varies across sectors, practitioners apply the technique that best suit their particular circumstances.

…

Similarly, Roger A. Morin, in the context of U.S. regulation, mentions the use of the CAPM, DDM, risk premium models, and the comparable earnings method, concluding:[17]

> No one individual method provides the necessary level of precision for determining a fair return, but each method provides useful evidence to facilitate the exercise of an informed judgment. Reliance on any single method or pre-set formula is inappropriate when dealing with investor expectations because of possible measurement difficulties and vagaries in individual companies' market data.

…

Regarding the methods used to determine the so-called Equity Risk Premium (ERP), the Ontario Energy Board concluded:[18]

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[15] Stewart C. Myers, "On the Use of Modern Portfolio Theory in Public Utility Rate Cases: Comment," *Financial Management* , Autumn 1978.

[16] Jonathan Berk and Peter DeMarzo, *Corporate Finance: The Core* , 2009, (Berk & DeMarzo 2009) p. 420.

[17] Roger A. Morin, New Regulatory Finance, Public Utilities Reports, Inc., 2006, (Morin 2006) p. 428. Quoted in Brattle Group p48.

[18] Ontario Energy Board, "*EB-2009-0084, Report of the Board on the Cost of Capital for Ontario's Regulated Utilities*," Issued December 11, 2009, p. 36 (emphasis in the original). Quoted in Brattle Group p49.

the use of multiple tests to directly and indirectly estimate the ERP is a superior approach to informing its judgment than reliance on a single methodology.

Critically, GGT concurs with APIA that each methodology applied to assist in determining the cost of equity must be applied fully and faithfully. In particular, for each model to which the regulator has regard, the results of that model must be determined with the degree of rigour as if it were the sole model being relied upon to guide the regulator's discretion. It would not be appropriate for the regulator to purport to have had regard to a model or methodology which has been applied half-heartedly.

2.3.1 "Relevant" as a threshold

GGT notes that the Rules require the AER to have regard to "relevant estimation methods, financial models, market data and other evidence".[19] GGT considers, and its consultations with the AEMC confirm, that "relevant" is intended to be a very low threshold. It therefore reflects a presumption that a broader range of models, methods and evidence are more likely to be "relevant" than not.

Within the context of the Rules, GGT considers that the threshold question is not "what other evidence is relevant" as much as "is there any evidence that could reasonably be considered to be irrelevant?"

In this regard, APIA has asked The Brattle Group to assess two approaches previously applied by the AER, being an assessment of premiums paid in takeover transactions and an assessment of market-to-RAB multiples.[20] In both cases The Brattle Group has found that these methodologies are of low relevance in informing the regulator's view on a business' required cost of capital.

Consistent with its broader views on this matter, GGT considers that it is incumbent on the Authority to:

- include a broad range of models, market information and data sources in the Guideline, consistent with the "relevant" threshold, and
- have regard to further information proposed by the regulated business in the context of a regulatory price review submission (i.e. information or data sources not already reflected in the Guideline) through the lens of the "relevant" threshold.

[19] Rule 87(5)(a).
[20] Brattle Report page 58.

3 The benchmark efficient entity

The Allowed Rate of Return Objective in Rule 87(3) refers to "the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the service provider". Although there were a number of submissions to the AEMC seeking clarification of this concept, the AEMC left it open to regulators to consider this question in the context of preparing the Rate of Return Guidelines.[21]

Particularly in the case of gas pipelines, GGT submits that the benchmark efficient entity, in the context of the Allowable Rate of Return Objective, cannot be applied in a "one size fits all" manner. This is evident from the words "*with a similar degree of risk which applies to the service provider*".

As discussed more fully below, gas transmission pipelines are bespoke businesses, with sharply different rick characteristics relative to electricity transmission or distribution, or to gas distribution.

In this regard, the more generic the "benchmark efficient entity" used by the regulator, the more critical it will be for the regulator to adjust its findings for the risks of the business to achieve a benchmark "*with a similar degree of risk which applies to the service provider*".

3.1 Adjustment for risk positioning

In GGT's view the regulator can only achieve this by considering what the service provider's individual risk characteristics would be, assuming the service provider met benchmark levels of efficiency. It cannot undertake this task in the abstract, by simply having regard to generic risks that might be faced by some conceptual entity. This conclusion is also supported by the AEMC's statements that:

> "the objective is focused on the rate of return required by the benchmark efficient service provider, with similar risk characteristics as the service provider the subject of discussion "[22];
>
> "the regulator must determine a rate of return that is consistent with that required by a benchmark efficient firm with similar risk characteristics to the service provider in question"[23]; and
>
> "the [allowable rate of return objective] incorporates the concept of a benchmark efficient service provider, which means that the regulator can conclude that the risk characteristics of the benchmark efficient service provider are not the same for all service providers across the electricity transmission, electricity distribution and gas and / or within those sectors"[24]

It is also a point made by the Brattle Group in the report attached to the APIA submission. It argues that "[p]rovided that the range has been developed in an

[21] AEMC Rule Determination p77.
[22] AEMC Rule Determination piii.
[23] AEMC Rule Determination p65.
[24] AEMC Rule Determination p67.

appropriate way that takes account of the market and industry factors described in this section, the final step is to consider the relative risk of the target company compared to the sample of companies from which the cost of equity range has been developed. The cost of equity is adjusted upwards or downwards depending on the target entity's risk characteristics relative to those of the sample."

This is of particular importance to GGT. By way of comparison, an electricity transmission network ultimately serves the entire population and industry base of the host economy. It therefore enjoys the broadest possible diversification in its customer base. Moreover, being subject to a revenue cap form of regulation, it is insulated from movements in the economy as a whole.

In contrast, the fortunes of gas transmission pipelines are beholden to a small number of large industry users; the role of the domestic load is relatively small. Extensions or expansions are driven by discrete new industrial projects rather than by organic population growth. Gas transmission businesses are subject to a price cap form of regulation, and are therefore exposed to changing levels of demand.

In GGT's case in particular, the pipeline serves fewer than 20 users, highly concentrated in the minerals extraction industry. GGT's risk profile much more closely resembles the mining sector it serves rather than the economy wide diversification enjoyed by the electricity industry.

GGT submits that the more generic the regulator's view of the "benchmark efficient firm", the more critical it will be for the regulator to adjust its findings for the risks of the business to achieve a benchmark "*with a similar degree of risk which applies to the service provider*".

4 Return on equity

As discussed above, GGT is concerned that the Consultation paper is very "CAPM-centric" in its approach.

A key message of this submission is that no single model, including the SL-CAPM alone, can adequately estimate the cost of equity in all market conditions.

Importantly, if the Authority's determination of the Return on Equity is below the rate of return commensurate with the prevailing conditions in the market for equity funds, the pipeline will be unable to attract equity capital to fund extensions and capacity expansions. This will have a chilling effect on investment in pipeline infrastructure, and a consequential chilling effect on investment in other sectors of the economy relying on access to that infrastructure.

4.1 Rule requirements

The Rules are clear that the regulator's findings on the return on equity must contribute to the Allowed Rate of Return Objective and also be determined having regard to the prevailing conditions in the market for equity funds:

> Return on equity
>
> (6) The return on equity for an access arrangement period is to be estimated such that it contributes to the achievement of the allowed rate of return objective.
>
> (7) In estimating the return on equity under subrule (6), regard must be had to the prevailing conditions in the market for equity funds.

4.2 Models for estimating the return on equity

The APIA submission and the attached Brattle Group report discuss a number of models and methodologies to estimate the cost of equity. GGT refers the Authority to that submission.

APA GasNet, in its submission to the AER, commissioned a paper by Professor Alan Gregory of Exeter University. In that paper, Professor Gregory notes that the Market Risk Premium, a key input to the SL-CAPM, cannot be observed in market data. Critically, the MRP must be analysed as its component parts, that is, the difference between the Market Return and the Risk Free Rate (that is, $R_m - R_f$). This report is attached, and is discussed in more detail below.

APA GasNet also submitted a report by Ernst & Young[25] which analysed the findings of a large sample of expert reports prepared in the context of business valuations. EY found that, overwhelmingly, independent experts focused on the overall cost of equity rather than any particular CAPM parameters.

[25] Ernst & Young, *Market Evidence on the Cost of Equity* - Victorian Gas Access Arrangement Review 2013-2017, 8 November 2012. Attached

Importantly, The Brattle Group found that two methodologies employed by the AER, being the analysis of book-to-RAB multiples, and premiums paid on acquisition, have low relevance in estimating the cost of equity.

4.3 Issues applicable to the SL CAPM

There are a number of well researched and documented concerns with the generic Sharpe-Lintner CAPM, notably its under-estimation of the cost of equity for low-beta companies (addressed by the Empirical, or Black CAPM) and its tendency to under estimate the required return on equity in market conditions driven by low risk free rates.

4.3.1 Market Risk Premium

Importantly, the SL-CAPM fails to reasonably estimate the cost of capital in market circumstances featuring low risk free rates. This is addressed in the APIA Brattle report:[26]

> The very low current risk-free rates make the cost of equity estimates from a standard implementation of the Sharpe-Lintner CAPM also very low at a time when volatility measures indicate that the MRP has increased as well. Therefore, these market circumstances call for a serious consideration of economic factors or other models rather than a mechanical implementation of the Sharpe-Lintner CAPM.

and was also addressed in a report prepared by CEG in a submission by APA GasNet to the AER, referring to advice to the AER by Governor Stevens of the Reserve Bank of Australia. Governor Glenn Stevens advised:[27]

> I therefore remain of the view that CGS yields are the most appropriate measure of a risk-free rate in Australia.
>
> That said, market risk premia are unlikely to be stable through time. While it is a reasonably simple matter to infer changes in debt risk premia from market prices, it is less straightforward to do so for equity premia. In making use of a risk-free rate to estimate a cost of capital, it is important to be mindful of how the resulting relativity between the cost of debt and that of equity can change over time and whether that is reasonable.

Regarding which Dr Hird comments:

> Noting also for context that the RBA has already said in its letter that there has been a “general increase in risk premia on other assets” (which the RBA does

[26] Brattle Group report p60.

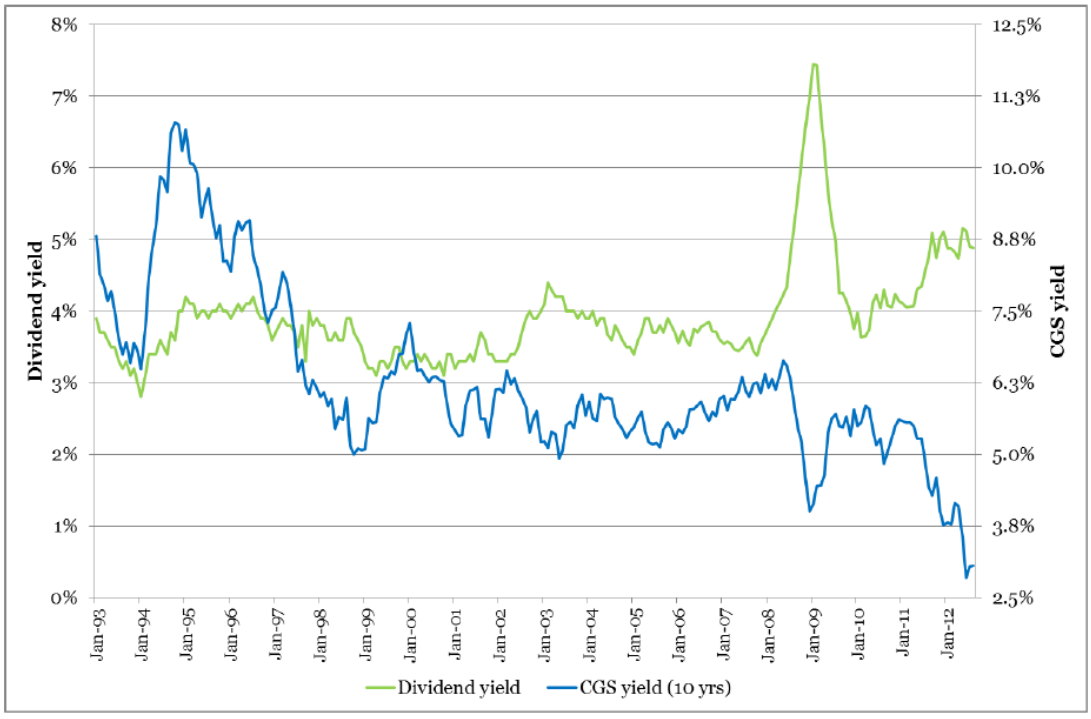
[27] Reserve Bank of Australia, Letter to the ACCC: *The Commonwealth Government Securities Market*, 16 July 2012, p. 1 (RBA, Letter regarding the CGS market, July 2012). Quoted in CEG, *Internal Consistency Of MRP And Risk Free Rate - Response to AER Vic gas draft decisions*, November 2012. Attached.

not limit to debt assets). My interpretation of what the RBA is saying is embodied in my paraphrasing below:

"Be conscious that market risk premiums are unstable through time. While you can easily and directly measure risk premiums in debt markets and these are rising (as we described above), you can less easily observe risk premiums for equities. However, the natural assumption would be that if risk premiums on debt assets are widely rising then risk premiums on equities are as well. Using a historically low CGS as the risk free rate, but applying fixed risk premia for equities, might result in an unrealistically low cost of equity – especially in the context where debt risk premiums have been rising. It would be prudent to be mindful of this relativity given that debt and equity risk premiums are likely to be related."

There is clear evidence that the Risk Free Rate and the Market Risk Premium are negatively correlated; in times of low Risk Free Rates (such as currently observed), the Market Risk Premium is elevated:[28]

Figure 5: Dividend yield on ASX versus 10 year CGS yields



Source: RBA, CEG analysis
Note: Figures used in this chart are month-end figures published by the RBA in the RBA Monthly Bulletins (1993-2012) and correspond to the dividend yield information

The consistent measurement of the risk free rate and the market risk premium was also addressed by Professor Alan Gregory, Professor of Corporate Finance, Xfi Centre, University of Exeter:[29]

[28] CEG, *Update to March 2012 Report On Consistency Of The Risk Free Rate And MRP In The CAPM*, November 2012. Attached

4. In summary, my view is that the AER is in error in its assessment of the cost of equity capital for the Gas Businesses and has significantly under-estimated that cost of equity.

5. It has made such an error because it has been inconsistent in its approach to estimating the market risk premium (MRP) and in doing so has combined two different measures of the risk free rate into its Capital Asset Pricing Model (CAPM) estimate of the cost of equity. In my view, combining such different measures is illogical and is therefore "unreasonable", in the sense set out in paragraphs 50-55 of the Australian Competition Tribunal's Decision of 11th January 2012.

6. In more detail, it has combined an MRP that has been largely derived from historical observation with a current spot rate estimate of the risk free rate. In doing so, it has assumed that the MRP is constant, and has made no allowance for any possible inverse relationship between the risk free rate and the MRP. Other regulators, both in the UK and in Australia (IPART) are aware of this potential relationship and have made due allowance for it.

7. The AER could have adopted one of two consistent approaches that would have avoided this error. It could either have estimated the expected return on the market directly, and used this estimate with its preferred risk free rate in the CAPM. As I explain below, this would have been in line with the approach recommended to UK regulators in the Smithers' Report, 2003.

8. Alternatively, it could have made allowance for the exceptional conditions in global government bond markets, following the global financial crisis and international quantitative easing programmes, and used an estimate of the risk free rate determined largely from historically observed rates. This would then have been consistent with its use of an MRP based largely on historically observed MRPs.

…

11. At this point it is worth emphasising exactly what asset pricing theory tells us that the basic CAPM relationship is, in terms of deriving the expected return on any asset (Ri):

$R_i = RF + \beta_i(E[RM] - RF)$ (1)

12. The term in parentheses is often abbreviated to the "equity risk premium" or "market risk premium", but writing the equation out in its original form serves as a reminder that the precise definition of MRP is the expected return on the market (E[RM]) minus the risk free rate, RF. As Jenkinson (1993) points out, the important point is that there is only one RF term on the right hand side of the CAPM, not two.

13. A very common error, which has been discussed in recent UK regulatory appeals, is to implicitly assume the two RF terms are different. An example

[29] Professor Alan Gregory, *The AER Approach to Establishing the Cost of Equity – Analysis of the Method Used to Establish the Risk Free Rate and the Market Risk Premium*, November 2012. Attached.

would be where a current estimate of the risk free rate (say the yield on a government bond) is combined with an historically derived estimate of the MRP. In such a case, the version of the CAPM being employed is actually:

$R_i = RF_{current} + \beta_i(RM_{historic} – RF_{historic})$ (2)

14. This simply illustrates Jenkinson's point that two different RF terms have been employed, and there is no theoretical validity in such a model. In general, the correct model to apply is:

$E(R_i) = RF + \beta_i(E[RM] – RF)$ (3)

Where E(Ri) and E(RM) denotes the expected return on the equity of firm i and the market respectively.

GGT submits that this is directly relevant to the requirements of Rule 87(5)(c):

(5) In determining the allowed rate of return, regard must be had to: …

(c) any interrelationships between estimates of financial parameters that are relevant to the estimates of the return on equity and the return on debt.

5 Return on debt

The allowed return on debt is particularly significant, as the cost of debt makes up 60% (under current conventions) of the weighted average cost of capital. It is also critically important as infrastructure business are heavily levered and thus make regular forays into debt markets, both to roll over existing debt and to raise new debt for extensions and expansions of the asset.

The most important point is that the return on debt must be sufficient for the business to raise capital in the marketplace to invest in infrastructure assets. It is only in this way that the cost of debt can contribute to the Allowed Rate of Return Objective as required by Rule 87(8).

In this respect, GGT is most concerned regarding the Authority's application of its "bond yield" approach, which GGT considers does not deliver a Return on Debt that promotes the achievement of the Allowed Rate of Return Objective.

In the AER's draft decision on the Victorian Transmission System, the AER applied an approach based on deriving a Debt Risk Premium (DRP) by extrapolating the Bloomberg Fair Value curve.

In that draft decision, dated September 2012, the AER derived a DRP of 3.76 per cent above the risk free rate for a cost of debt of 6.74 per cent. However, the AER commented that, had it applied the ERA bond yield approach, it would have derived a much lower DRP of 2.72 per cent, translating to a cost of debt of 5.70 per cent.[30]

GGT submits that a methodology deriving such an unreasonably low estimate of the required Return on Debt cannot reasonably contribute to the achievement of the Allowed Rate of Return Objective. In particular:

- In November 2012, APA Group issued GBP350 million (A$536 million) of 12-year fixed-rate Medium Term Notes (MTNs) swapped into fixed A$ obligations, with an effective interest rate of 7.36 per cent.[31]
- In October 2012, APA Group issued US$750 million of senior guaranteed notes in the Unites States 144A market which swap back to A$ at 6.68 per cent.[32]
- In June 2012, APA Group issued C$300 million (A$289.5million) of seven-year medium term notes which swap into A$ at 6.75 per cent.[33]
- In January 2012, APA Group issued JPY10 billion (A$126 million) of 6.5 year medium term notes, which swapped into A$ at 6.8 per cent.[34]
- In June 2010, APA Group issued A$300 million of 10-year notes with a 7.75% coupon rate.[35]

[30] AER, *Access arrangement draft decision - APA GasNet Australia (Operations) Pty Ltd 2013–17*, s7.2.
[31] APA Group ASX Release 20 November 2012.
[32] APA Group ASX Release 04 October 2012.
[33] APA Group ASX Release, 22 June 2012.
[34] APA Group ASX release, 24 January 2012.
[35] APA Group ASX Release 25 July 2010.

GGT submits that the ERA's bond yield approach does not deliver a cost of debt that would allow an infrastructure business to secure capital in the marketplace. This will curtail the scope of investment that the pipeline is able to undertake, which will invariably result in a chilling effect on investment in pipeline infrastructure and consequentially in other sectors of the economy.

Should the ERA persevere with its bond yield approach in the face of the AER adopting a more realistic approach in the eastern States, a business with a national footprint would naturally prioritise investment in those jurisdictions with a higher allowance for the cost of debt in preference to those jurisdictions with a lower allowance for the cost of debt.

This has the scope to cause infrastructure businesses to reduce investment in WA in preference to the eastern states, and would similarly result in a chilling effect on investment across many sectors of the WA economy.

5.1 The Tribunal's findings in *WA Gas Networks* and *DBP*

The ERA Consultation Paper appears to imply that the Australian Competition Tribunal has endorsed the bond yield methodology applied by the Authority. However, in *WA Gas Networks*, the Tribunal only found that the ERA did not err, in the context of s246 of the NGL,[36] in its decision to apply a methodology other than observing the Bloomberg Fair Value curve. As discussed in the AEMC's Final Rule Determination, the Tribunal did not turn its mind to the question of whether the ERA's methodology resulted in a cost of capital that was commensurate with the cost of funds in the marketplace as required under (then) Rule 87(1).

Rather, the Tribunal presumed that if the model was well-accepted and providing the inputs were appropriate, it would, by definition, deliver a rate of return that would be "commensurate with prevailing conditions in the market for funds" in accordance with the previous Rule 87(1). The Tribunal however qualified its findings with the comment "if that approach and that model are well accepted".[37]

GGT submits that there remains considerable doubt as to whether the bond yield approach is indeed well-accepted.[38]

[36] *Application by WA Gas Networks Pty Ltd (No 3)* [2012] ACompT 12, [167]; *Application by DBNGP (WA) Transmission Pty Ltd (No 3)* [2012] ACompT 14, [309].
[37] *Application by WA Gas Networks Pty Ltd (No 3)* [2012] ACompT 12, [63]; *Application by DBNGP (WA) Transmission Pty Ltd (No 3)* [2012] ACompT 14, [84].
[38] In *WA Gas Networks,* the Tribunal did not turn its mind to the question of whether the bond yield approach is a well accepted approach or a well accepted financial model. The Tribunal does note at [64] that ATCO Gas accepts that the WACC methodology and the SLCAPM are well accepted approaches.

5.2 Methodologies allowed under the Rules

The Rules are relatively flexible in terms of how the return on debt is to be calculated, with the important caveat that the "return on debt … is to be estimated such that it contributes to the achievement of the *allowed rate of return objective":*

> Return on debt
>
> (8) The return on debt for a regulatory year is to be estimated such that it contributes to the achievement of the *allowed rate of return objective*.
>
> (9) The return on debt may be estimated using a methodology which results in either:
>
> (a) the return on debt for each regulatory year in the *access arrangement period* being the same; or
>
> (b) the return on debt (and consequently the *allowed rate of return*) being, or potentially being, different for different regulatory years in the *access arrangement period*.
>
> (10) Subject to subrule (8), the methodology adopted to estimate the return on debt may, without limitation, be designed to result in the return on debt reflecting:
>
> (a) the return that would be required by debt investors in a benchmark efficient entity if it raised debt at the time or shortly before the time when the AER's *decision* on the access arrangement for that *access arrangement period* is made;
>
> (b) the average return that would have been required by debt investors in a benchmark efficient entity if it raised debt over an historical period prior to the commencement of a regulatory year in the *access arrangement period*; or
>
> (c) some combination of the returns referred to in subrules (a) and (b).

The key is that the "return on debt … is to be estimated such that it contributes to the achievement of the *allowed rate of return objective."* That is, in combination with the return on equity, "the rate of return for a service provider is to be commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the service provider in respect of the provision of reference services."

5.3 The ERA bond yield approach

Both Rules 87(10)(a) and (b) refer to the "return that would be required [would have been required] by debt investors" *at the time that debt was raised* (emphasis added).

However, the Authority's bond yield approach does not measure the cost of debt at the time the debt was raised, but rather the current market yield on historical debt issues at the time of the Authority's assessment of the relevant Access Arrangement.

This process introduces significant scope for the business to be exposed to structural losses arising from the term structure of interest rates.

To illustrate, reproduced below is Table 1 from the Authority's revised decision on ATCO Gas.[39]

What is not clearly shown on this table is how the "Bond's own DRP" is calculated. Analysis of this table clearly uncovers that the "Bond's own DRP" is based on the market observed yield associated with the individual bonds at the date of the ERA's review.

No.	Bond	Amount (A$'000)	Weight (Issuance)	Maturity	Years to Maturity as at 20 Dec 2010	Weight (Term)	Combined Weight	Bond's own DRP	Contributed DRP
1	APT PIPELINES LTD	300,000	0.126	22/07/2020	9.589	0.143	0.228	2.853	0.651
2	BANK OF QUEENSLAND LTD	140,000	0.059	4/06/2018	7.456	0.111	0.083	2.771	0.229
3	DEXUS FINANCE PTY LTD	180,000	0.076	21/04/2017	6.336	0.094	0.090	2.997	0.271
4	LEIGHTON FINANCE LTD	280,000	0.118	28/07/2014	3.606	0.054	0.080	3.647	0.292
5	SYDNEY AIRPORT FINANCE	175,000	0.074	6/07/2015	4.544	0.068	0.063	3.064	0.193
6	MIRVAC GROUP FUNDING LTD	150,000	0.063	15/03/2015	4.236	0.063	0.050	2.836	0.143
7	MIRVAC GROUP FINANCE LTD	200,000	0.084	16/09/2016	5.739	0.086	0.091	2.949	0.268
8	NEW TERMINAL FINANCING C	100,000	0.042	20/09/2016	5.750	0.086	0.046	3.649	0.166
9	BBI DBCT FINANCE PTY	150,000	0.063	9/06/2016	5.469	0.081	0.065	4.867	0.317
10	SNOWY HYDRO LIMITED	104,000	0.044	25/02/2013	2.181	0.032	0.018	2.271	0.041
11	SANTOS FINANCE LIMITED	100,000	0.042	23/09/2015	4.758	0.071	0.038	1.595	0.060
12	WESFARMERS LTD	400,000	0.168	11/09/2014	3.725	0.056	0.118	1.725	0.204
13	WESFARMERS LTD	100,000	0.042	11/09/2014	3.725	0.056	0.030	1.936	0.057
TOTAL		**2,379,000**	**1.000**		**67.114**	**1.000**	**1.000**		**2.893**

Source: The Economic Regulation Authority's analysis

If we examine (for example) line 10 for the Snowy Hydro Limited bond maturing 25 February 2013, we see that its "Years to Maturity as at 20 December 2010" is shown as 2.181 years. The observed market yield on this bond will therefore be quoted relative to debt with a term to maturity of a little over two years.

However, Snowy Hydro Limited bond AU000SHL0034 was issued on 25 February 2003,[40] that is, with a term to maturity of 10 years. Snowy Hydro remains liable for coupon payments on that bond at its original interest rate on the face value of the bonds at a rate commensurate with the cost of 10-year debt. However, the ERA's bond yield approach includes only the yield associated with 2-year debt.[41]

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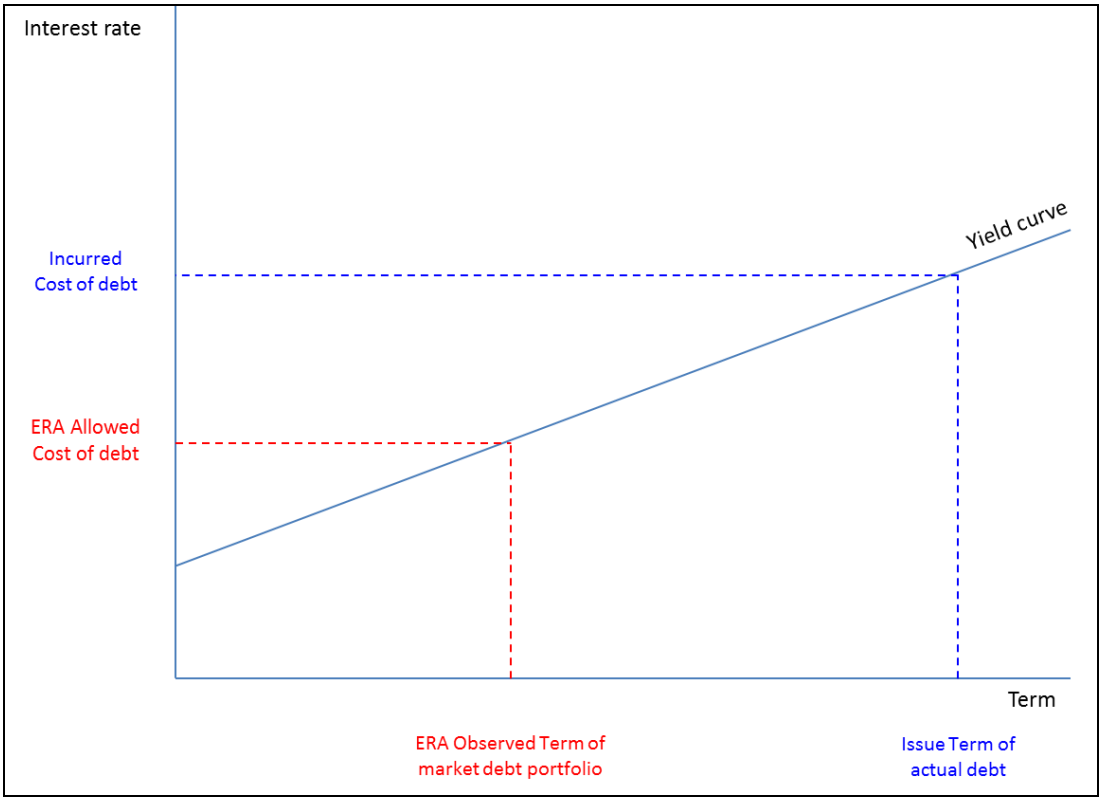
[39] Economic Regulation Authority, *Revised decision pursuant to rule 64(4) of the National Gas Rules giving effect to the Economic Regulation Authority's proposed access arrangement revisions for the Mid-West and South-West Gas Distribution System,* Revised by reason of and pursuant to orders of the Australian Competition Tribunal made on 8 June 2012, 25 June 2012.

[40] Bloomberg.

[41] This is not to say that the current yield on the Snowy Hydro bond has no information value. This current yield on the 2 year Snowy Hydro debt can be used to test the reasonableness of

In long term stable market conditions with a normal upward-sloping yield curve, the Authority's bond yield approach will systematically underestimate the cost of debt applicable to the service provider.

For example, assume a business issued 10-year debt with a coupon rate of 10 per cent; the coupon payments do not change with market conditions over the life of the bond. If the Authority's bond yield approach developed a portfolio of shorter term bonds[42] with a commensurate lower market yield, the business would be unable to recover its actual cost of debt.



That is, the business in the above example will always pay the applicable coupon rate on a 10-year maturity bond. The ERA's bond yield approach would allow the business to recover the market yield related to 5-year debt (applying the ATCO Gas example above).

GGT submits that an imposed structural bias such as this is clearly in beach of the RPP in section 24(2) of the *National Gas Law*:

---

market yield curves such as the Bloomberg Fair Value Curve. In this respect the Snowy yield is informative, in contrast to the ERA's bond yield approach, in which it is determinative.

[42] The average term to maturity of the bond portfolio used in the ATCO Gas decision is 5.16 years based on a simple average, or 5.3 years based on an issue-size weighted average.

24—Revenue and pricing principles

(2) A service provider should be provided with a reasonable opportunity to recover at least the efficient costs the service provider incurs in—

(a) providing reference services; and

(b) complying with a regulatory obligation or requirement or making a regulatory payment.

GGT submits that the ERA's bond yield approach is not in accordance with Rules 87(10)(a) and (b); it is the benchmark cost of debt at the date of issue that is relevant to the calculation of the Return on Debt.

5.4 The "on the day" approach

Rule 87(10)(a) provides for the "on the day" approach, which assumes that the business finances its entire debt portfolio at a single time shortly before the regulator's Final Decision. This is the approach currently in use by the AER.

GGT submits that it will be critical to understand just what is being measured under this approach, importantly the term to maturity of the benchmark debt portfolio.

Further to the discussion above, it will be critical for this measure to reflect the long term nature of debt issues associated with long life assets. Should the ERA apply the observed term associated with the market portfolio assembled under its bond yield approach, presumably applied to a market yield curve such as the Bloomberg Fair Value curve, it will systematically under-compensate the business for the cost of its long term debt.

GGT submits that the "on the day" approach calculated under Rule 87(10)(a) must be based on a long term debt benchmark.

5.5 The "rolling average" approach

The purpose of the "rolling average" approach under Rule 87(10(b) is to allow the regulatory return on debt to mirror the term structure of the business' debt portfolio. In this respect the regulatory determination acts as a hedge on the actual cost of debt.

GGT submits that the key phrase in Rule 87(10)(b) is "would have been required". That is, if we assume the business issues one-tenth of its debt each year over a ten-year cycle, then this would require the cost of debt to be calculated as:

- 10% of the at-issue cost of 10-year debt that was issued 9 years ago, plus
- 10% of the at-issue cost of 10-year debt that was issued 8 years ago, plus
- 10% of the at-issue cost of 10-year debt that was issued 7 years ago, plus
- 10% of the at-issue cost of 10-year debt that was issued 6 years ago, plus

- …(etc)

That is, Rule 87(10)(b) requires the "rolling average" cost of debt to be calculated using the "at issue" cost of debt for the relevant historical benchmark term to maturity, not the current market cost of debt that is used in the ERA's bond yield approach.

5.6 Election by the regulated business

Critically, GGT submits that the methodology used to calculate the Return on Debt under Rule 87(10) should be at the discretion of the service provider.

GGT submits that allowing the regulator to decide the basis on which the return on debt is to be recovered through tariffs is tantamount to the regulator dictating the business' approach to managing its debt portfolio, which is beyond its duties under the national gas access regime.

5.7 The NPV=0 principle

Further to the above discussion, GGT is most concerned that the ERA proposes to restrict the calculation of the risk free rate and the cost of debt to a five year term, aligned to the length of the regulatory period.

Consistent with the discussion above, this would calculate the return on debt over a shorter term to maturity than the actual debt on issue, resulting in a lower allowed return on debt than the actual interest cost incurred. This will invariable cause the businesses to restructure their debt portfolios to match the ERA's benchmark term to reduce the shortfall between interest costs recovered through tariffs and actual incurred interest costs.

The consultation Paper outlines an important conclusion from Lally's work:[43]

> Lally concluded that the NPV = 0 principle is only satisfied on the following two conditions: (i) the terms of the risk free rate and the debt risk premium must be set equal to the regulatory control period; AND (ii) the regulated businesses choose their borrowing to match the regulatory cycle. Lally also concluded that departure from either of these conditions will lead to violations of the NPV = 0 principle.

and

> More recently, Lally (2010) has argued that where the average debt term used by regulated businesses materially exceeds five years (that is, the term of the regulatory cycle), and where these firms use neither interest rate swaps nor credit default swaps to convert the longer term (say 10-year) debt into the five year debt, then the "NPV = 0" principle would be violated. This is because the allowed costs would diverge from those actually incurred by the firms.

[43] ERA Consultation paper, pp49, 50.

GGT submits that assessing the Allowed Rate of Return by imposing the "NPV=0" principle is tantamount to the regulator dictating the financing arrangement of the infrastructure business, which is beyond its duties under the national gas access regime.

Attachments

CEG, *Internal Consistency Of MRP And Risk Free Rate - Response to AER Vic gas draft decisions*, November 2012.

CEG, *Update to March 2012 Report On Consistency Of The Risk Free Rate And MRP In The CAPM*, November 2012

Professor Alan Gregory, *The AER Approach to Establishing the Cost of Equity – Analysis of the Method Used to Establish the Risk Free Rate and the Market Risk Premium*, November 2012.

Ernst & Young, *Market Evidence on the Cost of Equity* - Victorian Gas Access Arrangement Review 2013-2017, 8 November 2012

COMPETITION ECONOMISTS GROUP

Response to AER Vic gas draft decisions

INTERNAL CONSISTENCY OF MRP AND RISK FREE RATE

November 2012

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COMPETITION ECONOMISTS GROUP

Table of Contents

List of Figures

List of Tables

1 Introduction and summary

1. My name is Tom Hird. I have a Ph.D. in Economics and 20 years' experience as a professional Economist. My curriculum vitae is provided separately.

1.1 Terms of reference

2. The Victorian gas businesses[1] have asked me to provide a response to the AER's draft decisions they have received on the cost of equity.

> *The terms and conditions upon which each of the Gas Businesses provides access to their respective networks are subject to five yearly reviews by the AER.*
>
> *The AER undertakes that review by considering the terms and conditions proposed by each of the Gas Businesses against criteria set out in the National Gas Law and National Gas Rules.*
>
> *Rule 76 of the National Gas Rules provides that the Gas Businesses' total revenue for each regulatory year is to be determined using the building block approach, in which one of the building blocks is a return on the projected capital base for the year.*
>
> *Rule 87(1) provides that the rate of return on capital is to be commensurate with prevailing conditions in the market for funds and the risks involved in providing reference services. Rule 87(2) provides that a well accepted approach incorporating the cost of equity and debt (such as the Weighted Average Cost of Capital (**WACC**)) is to be used along with a well accepted financial model (such as the Capital Asset Pricing Model (**CAPM**)) in determining the rate of return on capital.*
>
> *The Gas Businesses are seeking expert assistance in respect of their proposed estimates of the cost of equity to be used in the calculation of the WACC (through the CAPM) and the approach of the AER in recent draft decisions for each of the Gas Businesses.*
>
> *In this context the Gas Businesses wish to engage you to prepare an expert report which:*
>
> *(a) Updates your analysis in CEG's report : Internal consistency of risk free rate and MRP in the CAPM: March 2012 to:*

[1] Envestra, Multinet, APA and SPAusNet.

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(i) reflect the latest available market data and in light of the recent AER decisions; and

(ii) compare the volatility of outcomes derived from estimating a risk free rate using the CGS yields over a 10-40 day averaging period, using various different examples of such averaging periods over the past couple of years, versus the outcome of estimating the risk free rate using a long term average measured over an appropriate period.

(iii) Update your opinions on the methodologies for estimating the cost of equity.

(b) In a new report , respond to the AER's Draft Decisions for each of the Gas Businesses, including:

(i) Whether the AER's estimate of the cost of equity using an estimate for the MRP of 6% combined with a spot risk free rate (applying short term CGS yields) in your opinion reflects prevailing conditions in the market for funds and if not, why not.

(ii) The AER's statement that its methodology for estimating the cost of equity is to estimate a 10 year forward looking risk free rate and a 10 year forward looking MRP[1] and whether, in your opinion, the AER's methodology does achieve this.

(iii) The AER's response to the CEG March 2012 report set out in sections B1.2, B1.3 and the DGM estimates in B2.3 and B2.4 of the Appendices to the relevant Draft Decisions.

(iv) The AER's decision on the extent of the inverse relationship between the MRP and risk free rate (sections 4.3.2, 4.3.4 of Attachment 4 to the relevant Draft Decisions) (to the extent not covered in your update report).

(v) Your response to the AER's reliance on the RBA letter to the ACCC of 16 July 2012 that "CGS yields are the most appropriate risk free rate in Australia in prevailing market conditions."2

(vi) The AER's statements relating to addressing problems with one parameter by reference to another, and in particular, the statements of Professor Lally in respect of CEG's proposed method of using a long term average risk free rate.3

(vii) The report by Lally "Risk free rate and present value" August 2012 which argues that the use of a long term average risk free rate is inconsistent with the present value principle.

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(viii) Any other relevant matters you which to comment on arising from the AER's Draft Decisions and expert reports on the cost of equity, in particular the reports of Lally (July 2012) and McKenzie and Partington (April 2012 and Lally (August 2012).

[1] See page 58, 65, 80 of the RBP Final Decision

[2] Ibid page 66.

[3] See page 80 and report Lally: *Cost of equity and the MRP*, July 2012.

3. This report addresses part (b) of the above terms of reference. The AER's draft decisions are substantively the same so, for practical reasons, I have referenced the SPAusNet draft decision although the same AER analysis can be found in all decisions.

1.2 Summary of conclusions

4. The remainder of this report is set out as follows. Section 2.1 describes how the AER has used inconsistent terminology in its analysis of the MRP and the risk free rate. In particular, inconsistent use of the terms 'short run' and 'long run' and mutually inconsistent definitions of the concept of 'prevailing conditions'.

5. Section 2.2 shows that this inconsistent terminology results in logical errors of reasoning the end result of which is a violation of the CAPM. This violation of the CAPM results from two inconsistent definitions of the risk free rate being used in the CAPM formula. One effect of the use of inconsistent definitions is that the AER rejects having regard to 'transitory' changes in equity market conditions because it regards these as 'short term' but has full regard to transitory changes in the 10 year CGS market because 10 year CGS are a 'long term' asset.

6. Section 2.3 demonstrates the effect of this violation of the CAPM with a real world example. The example is from the RBP averaging period in the middle of this year. The RBP averaging period occurred at a time that the RBA Governor Glen Stevens described as a period when high risk aversion forced down CGS yields to their lowest level since federation. The AER passed on the full amount of this lower risk free rate in lower cost of equity with no offsetting increase in the MRP (despite higher risk aversion causing the fall in CGS yields). I show that the logic on which the AER justifies not passing on 'transitory' increases in risk premiums is inconsistent with the logic for passing on post federation lows in CGS yields caused by those heightened risk premiums.

7. Section 2.4 proposes two internally consistent ways of populating the CAPM formula. These are using consistent estimates of:

- the spot risk free rate coupled with the spot MRP (defined as the spot market cost of equity less the spot CGS rate);
- a forecast of the average future spot CGS yields coupled with a forecast of the average future MRP – both of which could be based on historical averages (on the assumption that the future will, on average, reflect the past).

8. Section 2.5 explains how the methodologies that I recommended in my March report fall into these internally consistent categories.

9. Section 2.6 addresses the consistency of these approaches with the NGR and NGL. While section 2.7 addresses how either of these approaches would promote regulatory certainty better than the current AER methodology.

10. Section 4 provides a critique of specific points in the AER draft decision and also the expert reports on which the AER relies. Section 3.1 identifies where the AER draft decision rejects a proposition that I did not put (ie., that CGS should not be used as the risk free rate), and, in so doing, fails to address the proposition that I did put; namely, that CGS and MRP should be set on an internally consistent basis.

11. Section 3.2 sets out why I believe advice from the RBA to the AER strongly supports the conclusions in my March report and why I believe that the AER has failed to correctly interpret the RBA advice.

12. Sections 3.3 to 3.5 provide responses to expert reports commissioned by the AER from Lally. In these sections I show that:

- Lally's analysis of my spot MRP estimate, properly carried out, strongly supports my conclusion that the spot MRP must be more than 6.0%;
- Lally's critique of my analysis of the behaviour of state government debt spreads is incorrect;
- Lally's paper on the choice of risk free rate and consistency with the 'present value principle' directly contradicts the AER's rejection of using a spot MRP estimate. That is, Lally's counsel to the AER is, consistent with my own advice, that it must use a spot MRP estimate if it is to use a spot CGS estimate.

13. Section 3.6 describes why the AER is incorrect to categorise my rationale for using a long run average risk free rate as a 'fix' for a problem with the MRP. The correct description of my rationale is to achieve internal consistency with the AER's continued reliance upon an MRP that is based itself upon an historical average.

14. Section 3.7 describes what I regard as errors of logic in the AER's sensitivity analysis of spot MRP estimates. This section also sets out how the AER employs a version of 'catch 22' logic Put simply, it is my view that the cost of equity in current market conditions has not fallen with the CGS yield (ie, the cost of equity is stable and the MRP tends to move in an offsetting direction). I and other experts have employed DGM analysis in support of this conclusion. However, the AER argues that this

DGM analysis is unreliable precisely because it produces evidence in favour of my proposition (ie, an unstable MRP in the face of an unstable risk free rate).

15. Section 3.8 describes what appears to be a source of many analytical errors in the draft decision – namely an incorrect interpretation of the CAPM formula as implying that the market cost of equity is a dependent variable determined by two independent variables being the risk free rate and the MRP.

16. Section 3.9 addresses the AER's views on whether the MRP is always inversely related to the risk free rate. In my opinion there is strong evidence for such a relationship through time. However, this is not critical to what the AER must decide; which is whether a negative relationship exists in the current market conditions.

17. Section 3.10 addresses what I regard as flaws in the AER's reasonableness tests.

18. I have read, understood and complied with the Federal Court Guidelines on Expert Witnesses. I have made all inquiries that I believe are desirable and appropriate to answer the questions put to me. No matters of significance that I regard as relevant have to my knowledge been withheld.

19. I have been assisted in the preparation of this report by Daniel Young and Johanna Hansson from CEG's Sydney office. However, the opinions set out in this report are my own.

Thomas Nicholas Hird

8 November 2012

2 Internal inconsistency in AER draft decision

2.1 Terminology: 'Prevailing conditions' and 'short/long term'

2.1.1 Inconsistent definitions

20. The AER uses the same terminology to mean different things at different places in its decision and logic. Specifically, the AER uses the same terminology to mean different things when applied to the risk free rate and when applied to the MRP.

21. The AER uses two distinct and internally contradictory definitions of 'prevailing conditions' when applied to:

- the risk free rate; to mean *prevailing spot market* conditions in the relevant averaging period (and the expected returns associated with buying assets *in that averaging period*); and
- the MRP; to mean something other than the prevailing spot required return on the equity market less the prevailing spot risk free rate (ie, not the spot MRP). Rather, the AER appears to define the 'prevailing conditions' as applied to the MRP to mean an MRP consistent with the expected *average future spot market conditions* over a future 10 year period.

22. Similarly, the AER uses 'long term' when applied to:

- the risk free rate to encompass values estimated to reflect the spot market conditions for a long term asset (10 year CGS); and
- the MRP to exclude values estimated to reflect the spot market conditions for long term assets (equities).[2]

23. The AER's different use of these terms is clearly established in its Draft Decision. In relation to the risk free rate being a 'long term' estimate, the AER states:[3]

[2] Equivalently, the AER uses 'short term' when applied to:

- the risk free rate in a manner that does not result in the spot market conditions for a long term asset (CGS) being defined as 'short term'; and
- the MRP in a manner that does result in the spot market conditions for a different long term asset (equities) being defined as 'short term'.

> *The prevailing 10 year CGS yield is a forward looking rate. The prevailing 10 year CGS yield varies over time, but this variation does not mean the yield is a 'short term' rate. Rather, according to the expectations theory on the term structure of interest rates, at any point in time the yield on long dated bonds (such as 10 year CGS) incorporates the market's expectation of the yield on shorter dated bonds over the next 10 years.*

And

> *The AER acknowledges that CGS yields change over time; this does not make CGS yields an inappropriate proxy for the risk free rate. Changes in CGS yields reflect changes in investor expectations and CGS yields therefore remain the best estimate of the forward looking risk free rate* ***at any point in time****.* [4] [Emphasis added.]

24. Here, the AER is clearly stating that, notwithstanding the fact that 10 year CGS spot yields may be volatile, the spot rate is still 'long-term' because the underlying asset is 10 years and, therefore, today's spot rate reflects a valuation of 10 years' worth of returns. Specifically, today's 10 year spot market yield on CGS is a long term expectation of the returns likely to be earned over the next 10 years.

25. By contrast, in the same decision, in referring to advice from McKenzie and Partington that the AER's position to increase the MRP to 6.5% during the GFC was not well justified because "we would not expect the crisis conditions and extreme volatility to extend over such a long period",[5] the AER concluded that:[6]

> *The AER has developed its understanding since the WACC review. Now, rather than increasing the MRP due to any short term effects, it considers it is reasonable to determine a long term (10 year) forward looking MRP.*

26. Similarly, the AER summarises other regulators' positions in stating that under the CAPM framework used by Australian regulators:[7]

> *The MRP is for a long term (for example, 10 years), which means short term (for example, one year) market fluctuations have little relevance.*

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3 AER, *Access Arrangement draft decision SPI Networks (Gas) Pty Ltd 2013–17: Part 2 Attachments*, September 2012, p. 150

4 AER, *Access Arrangement draft decision SPI Networks (Gas) Pty Ltd 2013–17: Part 3,* September 2012, p. 16

5 McKenzie, and Partington, *Supplementary report on the MRP*, February 2012, pp. 28–30.

6 AER, *Access Arrangement draft decision SPI Networks (Gas) Pty Ltd 2013–17: Part 3 Appendices*, September 2012, p. 81

7 Op cit, p. 164

27. These are inconsistent views of what the terms 'short term' and 'long term' mean. The AER characterises prevailing spot 10 year CGS yields as 'long term' on the basis that the underlying asset is long term. The AER acknowledges that market fluctuations have short term effects on the level of these yields (CGS yields are volatile) but argues that this does not make the yield 'short term' because the underlying asset has a life of 10 years.

28. Of course, equities are also long term assets, indeed longer term than CGS. However, when it comes to variations in the spot yield on equities[8] the AER rejects movements in this as 'short term' and argues that it has little relevance for its implementation of the CAPM.

29. The fluctuations noted as 'short term' in the quotes above are exactly the types of fluctuations in the risk free rate that are routinely passed on by the AER into estimates of the cost of equity, but the AER is arguing precisely the same movements in spot yields on equities are irrelevant to its choice of CAPM parameters.

30. The AER concedes that it operates a different basis for estimating the risk free rate and the MRP:[9]

> *Rule 87(1) of the NGR requires the AER to estimate a rate of return that reflects prevailing conditions in the market for funds. These prevailing conditions can be considered 'prevailing expectations' over the relevant forward looking investment horizon, which is 10 years. Accordingly, both the risk free rate and the MRP are forward looking estimates, although estimated using different types of data.*

31. The AER further elaborates that in relation to the MRP:

> *The AER acknowledges a possible theoretical case for a negative relationship between the risk free rate and MRP in certain circumstances. But there is no sound basis for establishing any such theoretical relationship for the duration of the relevant investment horizon. That investment horizon is a 10 year forward looking period for both the risk free rate and MRP.*[10]

and

> *… the AER is estimating a 10 year forward looking MRP. Accordingly, despite a possible tendency for the negative relationship over the short term,*

8 Including the MRP which is simply the difference between the spot yield on equities and the spot yield on CGS.

9 Op cit, p. 173

10 AER, *Access Arrangement draft decision SPI Networks (Gas) Pty Ltd 2013–17: Part 2*, September 2012, p. 174

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> *neither the theory nor the empirical evidence (see below) before the AER (including the material submitted by CEG) supports this relationship over longer periods.*[11]

and

> *McKenzie and Partington noted some empirical evidence of a negative correlation between the short term nominal government bill yield (short term) and future nominal excess returns on the market. However, this negative correlation becomes weaker as the time horizon becomes longer.*[12]

32. While the AER never transparently defines (eg, using a mathematical description) what it means by "a long term (10 year) forward looking MRP" it is clear that it has in mind a concept that gives weight to expected (forecast) future spot market conditions – such that weight is given to the future market conditions not just spot market conditions prevailing during the averaging period.

33. It is clear from the context of these quotes and the rest of the decision,[13] that the AER interprets *'prevailing expectations' over the relevant forward looking investment horizon, which is 10 years* to mean:

- The current spot rate for CGS. That is, *not* the forecast of future spot rates for CGS over 10 years.; and
- Something other than the spot MRP prevailing in the averaging period (ie, not the spot required return on the market portfolio less the spot 10 year CGS rate). Specifically, some sort of forecast of average future spot rates.

34. This internal inconsistency is problematic and can, in market conditions such as those which prevail at the time of writing, lead to serious errors in decisions made by the AER (as described in the next section). This is made manifest by the case study of the recent RBP decision which is discussed in the following section (section 2.3).

2.1.2 Inconsistent supporting logic

35. The AER also, unsurprisingly given the inconsistency in definitions, adopts inconsistent supporting logic for its definitions. The AER decision employs logic:

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11 AER, *Access Arrangement draft decision SPI Networks (Gas) Pty Ltd 2013–17: Part 2*, September 2012, p. 175

12 AER, *Access Arrangement draft decision SPI Networks (Gas) Pty Ltd 2013–17: Part 2*, September 2012, p. 176

13 For example, see the discussion in section 2.3 below where the AER repeats, and does not disagree with, RBA Governor Glen Steven's conclusion that very low CGS yields during mid 2012 (incidentally the RBP averaging period) were associated with (caused by) a 'flight to quality' and heightened risk aversion.

- in support of why short run fluctuations in the spot rate for the 10 year CGS must be fully reflected in the risk free rate estimate in the form of recourse to the "present value principle"; but does not apply the same logic to the determination of the MRP;
- in support of why short term fluctuations in equity market conditions should not be reflected in its long-term cost of equity estimate; but does not apply the same logic to the determination of the risk free rate.

36. Further detailing of these inconsistent approaches is outlined in section 3.1 below. Failing to apply the same logical framework to each parameter appears to be a by-product of an analytical approach that largely 'cordons off' discussion of the risk free rate from discussion of the MRP. Given that, as is discussed in the next section, the MRP is defined as the difference between the market return and the risk free rate, I consider that any analysis of the risk free rate must be carried over to the MRP.

37. In addition to section 3.1, perhaps the clearest example of this inconsistency resulting from 'cordoning off' discussion of the two variables is provided in section 2.3 below. In this section, I detail how the AER reaches the conclusion that, just because heightened risk aversion might depress the spot CGS rate (via a flight to safety), this does not alter the conclusion that the spot CGS rate is the best estimate of the risk free rate. However, the AER does not proceed to ask what should be the obvious question: if the spot CGS rate is depressed by heightened risk aversion should not the AER simultaneously reflect this in a higher risk premium (MRP) that is coupled with the depressed CGS yield?

2.2 Violation of the CAPM

38. The AER's inconsistent definitions violate the CAPM. To see this consider the CAPM formula below.

Equation (1)

$$Exp.Yield\ Eq^{i} = RFR + \beta^{i} \times (\ Exp.Yield\ Eq^{market} - RFR)$$

$Exp.Yield\ Eq^{i}$= the expected yield on an individual asset;

$Exp.Yield\ Eq^{market}$= the expected yield on the market portfolio;

β^{i}= the beta for asset i measured against the market portfolio;

RFR= the risk free rate.

39. Note that the risk free rate enters into this equation twice – once on its own and once in the definition of the MRP. These two definitions of the risk free rate need to be the same for the CAPM formula to be valid. This further means that the MRP

(and therefore the risk free rate embodied in the MRP) needs to be estimated on the same basis as the risk free rate that enters separately to the MRP.

40. Consider the case of an equity that has the same risk as the market ($\beta^i = 1$). Obviously, the expected yield on this equity has to be the same as the expected yield on the market. However, this will not be the case if different definitions of the risk free rate are used in the two places that the risk free rate enters the equation.

41. By way of example, consider the following scenario. Let the prevailing spot risk free rate be 3% and the prevailing expected yield on the market be 12%. Let the 10 year forecast of the average expected yield on the market also be 12% but the 10 year forecast for the average risk free rate be 6%. It follows from this that the spot MRP (the difference between the spot expected yield on the market and the spot risk free rate) is 9% while the forecast 10 year average MRP is 6%.

Table 2-1: Illustration of using mismatched parameter definitions

Parameter	Spot level	Forecast of 10 year average
β^i	1	1
Spot risk free rate	3%	6%
Expected yield on the market	12%	12%
MRP	9%	6%

Source: CEG

42. Populating the CAPM entirely with spot estimates of parameters will give an estimate of the spot cost of equity. Similarly, populating the CAPM with long term forecasts of parameters will give a long term forecast of the cost of equity. (In this example the two are the same but they need not be.)

43. Populating the CAPM with two different definitions of the risk free rate will not give a meaningful answer. The AER's reasoning would lead, in this example, to the following implementation of the CAPM.

$$Exp.Yield\ Eq^i = RFR_{Spot} + \beta^i \times (Exp.Yield\ Eq^{Market}_{10\ yr\ forecast} - RFR_{10\ yr\ forecast})$$

$$Exp.Yield\ Eq^i = 3\% + 1 \times (12\% - 6\%) = 9\%$$

44. This approach clearly arrives at an estimate that is neither the spot return on equity nor the long term forecast return on equity – and is below both. The reason is that the two risk free rates do not cancel out as they should if the risk free rate and the MRP were both consistently defined.

2.3 Error in AER methodology - RBP June/July 2012

45. The example from the previous section is not a purely hypothetical example.

46. It is my contention that market conditions influencing spot CGS yields at any given time will also be influencing spot equity market returns and, therefore, spot MRP estimates (which are simply the difference between these two). Moreover, there will be times when market conditions are such that very low spot CGS yields are associated with a normal (or even a heightened) spot cost of equity for the market – such that the spot MRP is heightened relative to normal.

47. I do not believe that there is any expert evidence that contradicts these contentions. Indeed, in several places where the draft decision discusses the risk free rate the AER accepts these contentions. However, it fails to deal with this in its analysis of the MRP – effectively dismissing such spot relationships as 'short term' and therefore irrelevant to its decision making on MRP (for which it applies a different definition of long-term than it does for the risk free rate).

48. By way of illustration, consider the case where the AER discusses the impact of a flight to quality on CGS yields. The AER admits that this is associated with both low spot CGS and high spot MRP, but fails to acknowledge the implications for its choice of MRP. A rather lengthy quote from the draft decision is instructive in this regard.

> *A definition of a flight to quality may include:*
>
> > Flight to quality episodes involve a combination of extreme risk- or uncertainty-aversion, weaknesses in the balance sheets of key financial intermediaries, and strategic or speculative behavior, that increases credit spreads on all but the safest and most liquid assets.[14]
>
> *There have been periods since the onset of the GFC that could be described as being flight to quality periods. However, the AER does not consider there has been a sustained flight to quality since the onset of the GFC. Glenn Stevens recently made the following comment:*
>
> > We saw one such one bout of anxiety in the middle of this year when financial markets displayed increasing nervousness about the finances of the Spanish banking system and the Spanish sovereign.
> >
> > The general increase in risk aversion saw yields on bonds issued by some European sovereigns spike higher; while those for Germany, the US and the UK declined to record lows. This flight to safety also saw market yields on Australian government debt decline to the lowest

[14] Caballero, R. and Kurlat, P., *MIT Department of Economics Working Paper No. 08-21, Flight to Quality and Bailouts: Policy Remarks and a Literature Review*, 9 October 2008, p. 1.

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> levels since Federation. Meanwhile many European economies saw a further contraction of economic activity and share markets decline sharply.[15]

A flight to quality would not provide justification to depart from a prevailing estimate of the risk free rate. Demand for highly liquid assets is likely to increase in a flight to quality period.[16] This would, all else the same, push the yield on risk free assets down. These actions reflect changes in investor expectations and perceptions of the relative value of a risk free asset and would not undermine the risk free nature of that asset.[17]

Shortly before RBA Governor Glenn Stevens made the comments above, the RBA provided the following advice:

> I therefore remain of the view that CGS yields are the most appropriate measure of a risk-free rate in Australia.[18]

This suggests that the RBA does not consider a flight to quality period makes CGS an inappropriate proxy for the risk free rate. [The italicised text above represents AER drafting while the indented smaller font text represents quotes from third parties which the AER reproduced.]

49. The AER's conclusion is beside the point. As the AER acknowledges elsewhere,[19] my previous report was not arguing that spot CGS yields are an inappropriate proxy for the risk free rate. I was arguing that there are circumstances (including current market circumstances) where low spot CGS yields are associated with high spot risk premiums. The above discussion and quote from Governor Glenn Stevens illustrates this clearly.

50. Moreover, the AER's focus on the need to establish a 'sustained flight to quality since the onset of the GFC' is misguided. There may, or may not, be a sustained flight to quality[20] but the point, amply demonstrated in the above discussion, is that

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15 Glenn Stevens, *Opening Statement to the House of Representatives - 24 August 2012 - Hansard script*, p. 2.

16 Caballero, R. and Kurlat, P., *MIT Department of Economics Working Paper No. 08-21: Flight to Quality and Bailouts: Policy Remarks and a Literature Review*, 9 October 2008, p. 2.

17 Discussed further in section 4.3.2.

18 Reserve Bank of Australia, *Letter to the ACCC: The Commonwealth Government Securities Market*, 16 July 2012, p. 1 (RBA, *Letter regarding the CGS market*, July 2012).

19 See below.

20 Indeed, there is a good case to argue that there will be a sustained elevation in risk premiums. This is the view expressed by the RBA Head of Financial Stability Department, Luci Ellis in a 24 October address to the CPA Australia Finance and Accounting Expo 2012:

if even a very brief flight to quality occurs during a business's averaging period then CGS yields will be pushed down even though the cost of equity (neither spot nor long term forecast) is not similarly pushed down.

51. Failing to address the impact of a flight to quality on the MRP is symptomatic of the previously described propensity for the AER to 'cordon off' discussion of the MRP from the risk free rate. Indeed, the above discussion from the AER comes from the risk free rate section (B.1) of Part 3 of the SP AusNet draft decision, specifically, from section B.1.2 titled *CEG contentions*. This section is a response to my earlier report. At the front of this section the AER states:

> *"…at the outset it is important to highlight that it is unclear to the AER what conclusion CEG seeks to draw from these observations and contentions. CEG does not argue these contentions make CGS an inappropriate proxy for the risk free rate in Australia."*

52. The AER goes on to address the issues I raised and, in each case, the AER concludes that CGS is nonetheless the best proxy for the risk free rate. However, I did not argue otherwise; as the AER appears to accept in the last sentence of the above quote. The argument that I did put related to the need for internal consistency between the risk free rate and MRP in the CAPM, goes unaddressed. Specifically, the AER does not address the contention that factors driving down CGS yields (such as flight to quality and heightened demand for safe assets from foreign investors) cannot be presumed to similarly drive down required returns on equity.

53. By establishing an analytical framework that both commits to relying on a spot estimate of the CGS estimate *and* rules out examining equity market conditions in the same period the spot CGS rate is estimated the AER is establishing a framework that cannot deal with the situations described above by Governor Stevens.

54. This is not a purely academic issue. A gas transmission pipeline regulated by the AER had its averaging period during the period described by RBA Governor Glenn Stevens as a 'flight to quality'. The Roma to Brisbane Pipeline (RBP) averaging period started on the 25 June 2012 and ended on 20 July 2012. The below figures shows how 10 year CGS yields and spreads between CGS and AAA rated (highly

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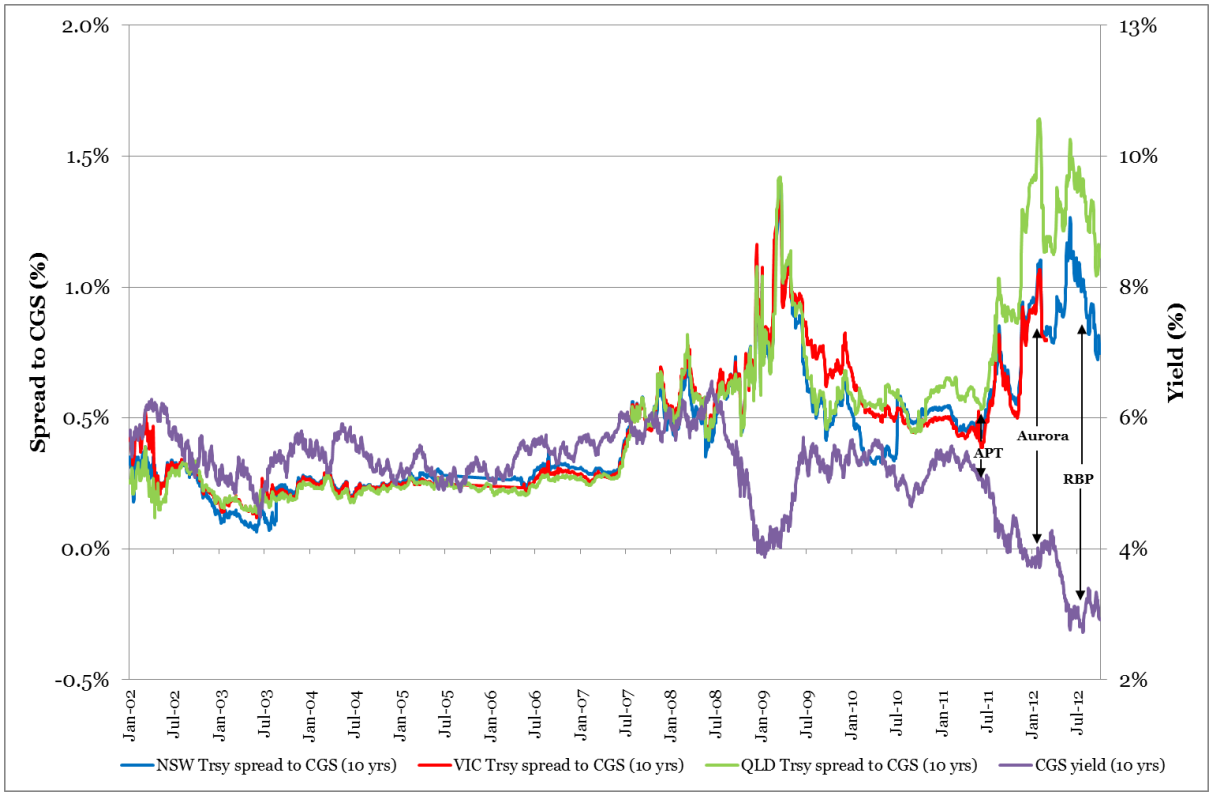
To conclude, five years on we are still in a world where risk aversion is high and some parts of the financial system seem dysfunctional. In some countries – though not Australia, I believe – the supply of credit is tighter than the underlying risks would require. I hope I won't come back in five years' time to deliver a speech titled 'Ten Years of Financial Crisis'. But I do think that the experience of the past five years has affected a whole generation of financial market participants and policymakers. We will never be able to regulate the financial boom-bust dynamic away entirely. There will always be people with the risk appetite and the incentives to become over-exuberant. It would not surprise me, though, if the next five or ten years see a lot less of that over-exuberance than we saw in the five or ten years leading up to 2007. The challenge will be to be ready to respond when those memories fade and the next generation of the overconfident are gearing up for a party.

liquid) NSW Treasury bonds have behaved – including specifically during the RBP averaging period.

Figure 2-1: CGS yields and spreads to CGS for NSW Govt. debt [Figure 4 from update report]



Source: Bloomberg, RBA, CEG analysis

55. I do not consider that there can be any doubt that the RBP averaging period fell within the period that Governor Glen Stevens (quoted above by the AER) described as follows:

> *The general increase in risk aversion saw yields on bonds issued by some European sovereigns spike higher; while those for Germany, the US and the UK declined to record lows. This flight to safety also saw market yields on Australian government debt decline to the lowest levels since Federation. Meanwhile many European economies saw a further contraction of economic activity and share markets decline sharply.*

56. Notwithstanding that the fall in CGS yields was a direct corollary of an "*increase in risk aversion*" and a "*flight to safety*" the AER passed the full amount of this fall in CGS to "*the lowest levels since Federation*" on in an assumed lower cost of equity for RBP – using almost identical arguments as it has used in this SP AusNet draft decision. That arguments effectively involves the AER claiming that it need not

examine what is occurring in the spot market for equity because this is 'short term' – despite giving sole reliance to the spot market yield on CGS (which it inconsistently claims to be 'long term'). As discussed in [section 2.7], other regulators, including other Australian regulators, recognise that this is not an appropriate regulatory stance.

57. The AER discussion of flight to quality analysed above is an extreme, but far from the only, example where the AER draft decision reaches a conclusion that the spot CGS is the appropriate measure of the risk free rate without attempting to simultaneously apply its logic to MRP. I step through other examples of this in section 3.1 below.

2.4 A consistent and meaningful application of the CAPM

58. There are two approaches to estimating a CAPM return on equity that could be considered to be consistent with prevailing market conditions and these correspond to the two mutually inconsistent definitions of prevailing market conditions outlined above.

- **Option 1**. Populate the CAPM with *prevailing actual spot rates* of parameter values measured during a short window of time, for example, a 20 day averaging period.
- **Option 2**. Populate the CAPM with *prevailing forecasts* of future spot parameter values over an investment horizon of, for example, 10 years; or

59. Either of these approaches can reasonably be described as an estimate consistent with prevailing market conditions. The first requires an estimate of the required return on equity during the averaging period. The second provides an estimate of the average required return on equity over the investment horizon specified.

2.5 CEG proposed methodologies

60. CEG's previous report on internal consistency of the risk free rate and the MRP provided two methodologies for estimating the CAPM parameters in an internally consistent manner. These align with the two options outlined above.

61. **Option 1.** If yield on CGS is measured as the spot rate in an averaging period, then the MRP needs to be measured relative to that CGS yield using an estimate of the required return on equity for the market specific to that averaging period. In this context, any estimate of the MRP in that period must ultimately be an estimate of the required market return on equity in that period (MRP=market required return on equity (Market RoE) less risk free rate = Market RoE – 10 year CGS yield).

62. **Option 2**. If the MRP is estimated as the average forecast over the next ten years (which, the AER claims, is reflected in 6%) then the risk free rate must be a forecast

of the average CGS yields over the same period. One such estimate is the historical average risk free rate (based on precisely the same logic the AER applies to arrive at a 10 year MRP forecast of 6%). Alternatively, option 2 could be implemented for both the MRP and the risk free rate by giving some weight to current levels of each parameter and some weight to historical averages.

63. For the reasons described in my previous report[21] and in my update to that report, both approaches to option 2 are likely to give very similar answers – given that the current spot CGS yield is depressed relative to historical averages but current spot market return on equity is not (and therefore the current spot MRP is heightened relative to historical averages by an offsetting amount). The same logic suggests that option 1 and option 2 will also give rise to very similar results.

64. This conclusion is borne out by my empirical analysis described in my update report[22] the spot return on equity for the market updated from the December 2011 period in my March 2012 report to September 2012 is 11.94%. The historical average approach to both risk free rate and MRP updated to September 2012 is 11.86%.

2.6 Consistency with the NGR and NGL

65. The AER presents an argument that all parameter inputs to the CAPM need to be the best estimate of the prevailing parameter. In this regard the AER relies on the construction that 87(1) defines the objective (to estimate a cost of capital consistent with prevailing market conditions) and 87(2) defines the mechanism (using a well-defined model such as the CAPM) and provided the parameter inputs to CAPM are 'prevailing' the objective is met.

66. The AER argues that the use of a historical average risk free rate in the CAPM is inconsistent with populating the CAPM with the best estimate of the prevailing parameter input – because this is defined by the prevailing spot CGS yield. The AER argues that any departure from the prevailing spot CGS can only be justified on the basis that doing so corrects an error with the MRP and that the appropriate way to correct that error is to change the MRP not make the risk free rate deviate from a prevailing estimate.

67. I certainly agree with the AER that the historical average risk free rate is not the best estimate of the prevailing *spot* CGS yield. However, using a historical risk free rate instead does not 'fix a problem' with the estimating a historical average MRP. Rather, it achieves consistency with such an estimate of the MRP and, in doing so,

[21] Internal consistency of the risk-free rate and the MRP in the CAPM, a report for Envestra, SP AusNet, Multinet and APA, prepared by Tom Hird, Competition Economists Group, March 2012.

[22] Hird, Update to March 2012 Report on consistency of the risk free rate and MRP in the CAPM, November 2012, Table 4.

gives rise to an estimate that, unlike the AER's methodology, is an internally consistent method for forecasting long term average required returns.

68. By estimating both the risk free rate and the MRP based on long run historical averages, the sum of the two results is an estimate of the market cost of equity that is coherent and internally consistent. On precisely the same grounds that the AER uses to justify the historical average MRP as a prevailing forecast, this methodology gives rise to a prevailing forecast of the cost of equity over the next 10 years. Specifically, to the extent that investors expect the future to reflect the past then they will expect future equity returns to reflect past equity returns. In September this approach led to an 11.86% estimate of the long term average market return on equity (5.86% risk free rate plus 6.0% MRP).[23]

69. The AER explicitly makes the assumption that the past determines future expectations with respect to the equity risk premium but provides no basis for not making the same assumption about the overall cost of equity. Indeed, the AER assumes that a low 10 year CGS yield today implies investors expect a correspondingly low market cost of equity today. There is no basis in theory for such a conclusion. Such a conclusion can only reasonably be reached by making an estimate of the market cost of equity today – an empirical question with which the AER incorrectly declines to engage.

70. However, I have done this and estimate that, in September, the spot estimate of the market return on equity was 12.0% – which gives rise to a spot MRP of 8.9% relative to the spot CGS yield 3.1%. Of the AER and its experts, only Lally attempts to arrive at a superior estimate. Lally's critique, if accepted, still arrives at a market return on equity (and MRP) that is less than 1.0% lower than my estimate – still well above the estimate derived from application of the AER's methodology. I discuss Lally's critique in more detail in section 3.3.

71. The way in which the draft decision critiques this estimate is problematic. The draft decision employs sensitivity analysis to demonstrate that the methodology is sensitive to input assumptions. In doing so, the AER shows, for example, that if the spot CGS rate was higher then the spot MRP would be lower. As I explain in section 3.7 this is not testing the sensitivity of my estimate to an assumption that is subjective or uncertain. The risk free rate I use in my analysis is the observed risk free rate actually prevailing. The AER sensitivity analysis is testing the sensitivity of my estimate to adopting a set of market conditions that are different to the market conditions prevailing in the period that the analysis is conducted over. The fact that the MRP would be lower if the market conditions were different and, other things constant, the risk free rate was higher is not a contested conclusion. I agree that this is the case but I do not consider that this conclusion is in anyway evidence of

[23] Hird, Update to March 2012 Report on consistency of the risk free rate and MRP in the CAPM, November 2012, Table 4.

unreliability of my estimate of the spot MRP that that is consistent with the spot risk free rate from those particular market circumstances. .

72. The fact that values of the market cost of equity estimated using "option 1" and "option 2" are very similar provides confidence that this is a reasonable forward looking estimate of the market cost of equity (whether defined as spot or forecast). This supports the general contention that the market cost of equity is not as volatile as each of its components. That the AER's estimate of the market cost of equity is significantly lower than both estimates does not provide a similar degree of confidence.

2.6.1 Consistency with the cost of debt

73. I note that it is standard practice for the AER and other Australian regulators to adopt a spot estimate of the cost of debt estimated in the averaging period. It is therefore a relevant question as to whether continuation of this practice requires that the cost of equity be estimated on a spot basis (option 1 above) or a forecast basis (option 2 above).

74. In my view the estimation of a benchmark spot cost of debt does not require that the same method be used to estimate the cost of equity. This is for two reasons. First, the practice of estimating a spot cost of debt by regulators in the averaging period has been associated with a thought experiment where the business is assumed to refinance all of its debt in that averaging period (either actually or, through the use of derivatives, synthetically). If this is what a business actually does then the spot cost of debt is identical to the forecast of the business's cost of debt – because the interest rate that the business pays will be 'locked in' to reflect the spot rates in the averaging period. Consequently, there is no distinction between the spot cost of debt and the forecast cost of debt under this scenario.

75. Secondly, even if the business does not/cannot refinance all of its debt in the averaging period, the benchmark spot cost of debt can still be viewed as a forecast of the future cost of debt on the basis that the best estimate of the cost of debt over the forecast period is the current cost of debt.

76. In this regard, I note that the cost of debt determined in the draft decision (6.74%) is very similar to the cost of debt determined by the AER/ACCC in pre-GFC (ie, pre 2008) regulatory decisions for gas and electricity monopoly businesses - which fall in a range 6.32% to 6.90%.[24] This is despite the average risk free rate for those decisions being 5.5% (or 2.5% more than in the draft decision). That is, this lower

[24] The relevant decisions that I have investigated are, in date order, Gasnet 2002 (6.90%), SPI PowerNet 2002 (6.32%), ElectraNet 2002 (6.39%), VENCorp 2002 (6.32%), Murraylink 2003 (6.32%), Transend 2003 (6.77%), EnergyAustralia (2005) 6.88%, TransGrid 2005 (6.88%) DirectLink 2006 (6.32%), Powerlink 2007 (6.82)%.

risk free rate has been more or less fully offset by a higher debt risk premium – much as I have estimated is the case with the cost of equity.

2.7 Achieving regulatory certainty and stability

77. As noted in section 2.3 of my update report,[25] the compensation for making equity investment allowed by the AER is highly unstable due to its combination of a volatile spot risk free rate with a stable historical average MRP. The effect of this is that the regulatory regime creates a 'roulette-wheel' for equity investors – with the timing of their averaging period equivalent to the fall of the ball on the roulette-wheel.

78. This volatility in allowed returns creates commercial uncertainty for businesses. For the reasons expressed in each of my reports during these proceedings, I do not believe that businesses' actual cost of equity moves in line with movements in the risk free rate. Consequently, there is no 'natural hedge' to the businesses for the volatility in the compensation provided to them.

79. This uncertainty is despite the fact that the AER methodology provides certainty and stability in the market risk premium that will be used. Indeed, it is the stability in the AER's estimate of the market risk premium that creates the instability in the allowed cost of equity as a result of volatility in risk free rates. As is discussed in section 5 of my update report, this need not be the case. There is strong regulatory precedent for focussing more on stability in the cost of equity than the market risk premium.

80. While such an approach will tend to make the risk premiums relative CGS that businesses earn more volatile, my view is that this volatility is not what investors care most about. In my view the evidence is stability in the total return allowed to is likely to be more valued by investors than stability in one of the individual components of that (ie, the risk premium).

[25] Hird, Update to March 2012 Report On consistency of the risk free rate and MRP in the CAPM, November 2012.

3 Response to specific AER claims

3.1 Failure to follow through RFR logic into MRP analysis

81. It is my contention that factors currently depressing spot CGS yields are not similarly depressing spot equity market returns and, therefore, the spot MRP (which is simply the difference between the first two series). Moreover, there will be times when market conditions are such that very low spot CGS yields are associated with a normal (or even a heightened) spot cost of equity for the market – such that the spot MRP is heightened relative to normal.

82. In order to reject my contention, it is necessary to either disagree with my views on what is causing historically low risk free rates and/or disagree with my view that these factors are not causing similar falls in the market cost of equity. When I discussed the factors impacting on the CGS market in my March report this was my purpose – to demonstrate that these factors were not likely to similarly depress the market cost of equity. This purpose was also expressed in the title of my report - *Internal consistency of risk free rate and MRP in the CAPM*.

83. However, as previously described in section 2.3 above, the AER does not engage with my analysis on these terms. Instead, the draft decision expresses ignorance of why I was describing the factors influencing the CGS market and largely responds to my analysis with arguments to the effect that CGS is a good proxy for the risk free rate.

> *"...at the outset it is important to highlight that it is unclear to the AER what conclusion CEG seeks to draw from these observations and contentions. CEG does not argue these contentions make CGS an inappropriate proxy for the risk free rate in Australia."*[26]

84. I have already described, in section 2.3 above, the period of the RBP averaging period which covered the low point for CGS yields and which the draft decision itself describes as a transitory flight to quality episode. In its own drafting the AER appears to accept that this was driven by increased risk aversion and therefore MRP (the draft decision quotes RBA Governor Stevens describing the period in this way and does not attempt to contradict him).

85. I believe that the only reasonable conclusion is that, in this period, the extremely low CGS yields in the RBP averaging period were not just associated with, but were actually driven by, heightened risk premiums. However, because the draft decision addresses my analysis of periods of flight to quality as an argument against using

[26] AER, *Access arrangement draft decision: SPI Networks (Gas) Pty Ltd 2013–17: Part 3*, p. 6.

the CGS yield in that period, rather than as an argument for setting the MRP consistent with that CGS yield, the AER did not address my core contention.

86. In this section I set out other instances of the same problem. Specifically, where the AER has in effect accepted my views about a factor driving down CGS yields but does not address the corollary of whether the same factor is driving down the cost of equity (such that the MRP is constant). In each case, the AER concludes that, even if my analysis is correct, this does not invalidate the use of CGS as the risk free rate in the CAPM – which is a proposition that I never put.

3.1.1 Heightened liquidity premium and implications for the cost of equity

87. I argued that one of the reasons that CGS yields were so low at the time of writing was that there was a heightened liquidity premium. I quoted RBA Assistant Governor Debelle making this claim. I also attributed some of the dramatic increase in spreads between CGS and state government debt to this heightened liquidity premium (and quoting other RBA publications in support of this).[27] The point that I was making was that if heightened liquidity premiums were pushing down CGS relative to the next most liquid asset (state government debt) then it could be expected to be pushing down CGS relative to the much less liquid equity market.

88. In response the AER states:[28]

> *Advice from the RBA and Treasury in 2007 suggested the use of nominal CGS as a proxy for the risk free rate was appropriate.[29] The AER does not consider it appropriate to attempt to determine an average, or 'normal', liquidity premium and only accept prevailing CGS when the observed premium is equal to the 'normal' premium.*

89. In doing so the AER rules out something that is not being asked of it and does not address my core contention. Namely, that heightened liquidity premiums will increase spreads between the most liquid assets (eg, CGS) and the less liquid assets (eg, equities).

3.1.2 Heightened demand for CGS from foreigners

90. I also argued that the sovereign debt crisis in Europe was creating a large increase in demand for CGS by foreigners – both because of increased risk aversion and a reduction in the amount of sovereign debt regarded by investors as risk free. I

27 See section 5.1.1 of my March report.

28 AER, *Access arrangement draft decision: SPI Networks (Gas) Pty Ltd 2013–17: Part 3,* pp. 10-11.

29 RBA, *Letter to the AER*, August 2007, p. 1; Australian Treasury, *The Treasury Bond yield as a proxy for the CAPM risk-free rate*, August 2007, p. 1.

argued that the same forces were not increasing demand for Australian equity investment – such that the spread between CGS yields and the required return on equity (the MRP) was rising.

91. The AER effectively accepted that increased demand from foreigners was reducing CGS yields – with the effect that spreads to other assets such as state government debt were increased. However, once more, the AER rejected the unmade argument that this makes CGS unfit as a risk free rate proxy. [30]

> *Increased demand from non-resident investors has also likely had an influence on the increased spreads. Demand from non-resident investors has been proportionately larger in the CGS market over the past few years. The Treasury and AOFM advice notes that non-resident ownership of CGS increased from around 50 per cent in mid-2009 to around 76 per cent in March 2012.[31] The advice also notes that non-resident ownership of semi-government securities has increased in the same period, albeit by a smaller amount.[32] As discussed in section 4.3.2 above, the AER does not consider that increased demand from non-resident investors makes CGS an inappropriate proxy for the risk free rate.*
>
> *Relative risk assessments are considered in the context of the MRP; found in attachment 4.3.3*

92. The AER also does state that it considers any implications for MRP in attachment 4.3.3. However, in section 4.3.3 the AER does not discuss the impact of demand for CGS by foreigners on the MRP at all. The AER does discuss the issue in 4.3.2 (Risk free rate) but it once more simply acknowledges the Treasury and AOFM advice that CGS yields are being pushed down by demand from foreigners.[33]

> *CGS yields are set in a market. Changes in yields for securities traded in a liquid market are likely to reflect the actions of many market participants at each point in time. So, market determined CGS yields are likely to reflect prevailing conditions in the market for funds. On its own, a price that is low relative to historical averages is not a sign that CGS are no longer a good proxy for the risk free rate. The current CGS yields are likely to reflect strong demand from foreign investors and a general re-assessment of the value of a risk free asset. Lower yields (higher prices) are an expected outcome from increased demand for those assets.*

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30 AER, *Access arrangement draft decision: SPI Networks (Gas) Pty Ltd 2013–17: Part 3*, pp. 14-15.

31 Treasury and AOFM, *Letter regarding the CGS Market*, July 2012, p. 2.

32 Treasury and AOFM, *Letter regarding the CGS Market*, July 2012, p. 2.

33 AER, *Access arrangement draft decision: SPI Networks (Gas) Pty Ltd 2013–17: Part 2*, p. 151.

The Treasury and the AOFM noted this point:

> The weak and fragile global economy has put downward pressure on benchmark global long-term bond yields, and is driving investors into high quality government debt. The AER believed that applying an averaging period that is closely aligned to the date of the final determination provides an unbiased rate of return that is consistent with the market conditions at the time of the final determination.[34] [sic]

An alternative conclusion might be that CGS are currently overpriced. If the price of CGS exceeds their fair value, then the corresponding yield will be 'too low'. But, to draw such a conclusion, the AER would need information superior to that of market participants, or it must 'know better' than the many traders whose interactions set the price of CGS. The AER does not possess a greater ability, expertise or knowledge than market participants and traders to counter any market determination.

93. In doing so the AER rules out something that is not being asked of it (positing a correction to CGS market prices) and does not address my core contention. Namely, that heightened demand for CGS by foreigners is not associated with heightened demand for Australian equity by foreigners - such that the spread between required returns on CGS and equities (the MRP) will increase.

94. I also note that the above quote from the Treasury and AOFM letter is not a full and accurate representation of the original. The original paragraph that the quote derives from is:[35]

> *The weak and fragile global economy has put downward pressure on benchmark global long-term bond yields, and is driving investors into high quality government debt.* ***As a result, Australia is reaping the benefits of a deep and liquid AAA-rated CGS market that is attracting strong demand from international investors****. [Emphasis describes the correct sentence that should have been included by the AER in the above quote.]*

95. In my view, this quote exemplifies the pertinent point. While the AAA rated CGS market is deep and liquid and prices are being driven up (yields down) by heightened demand for these attributes, there is no reason to believe that required yields on the Australian equity market are being similarly pushed down.

34 Treasury and AOFM, *Letter regarding the CGS Market*, July 2012, p. 1.

35 Treasury and AOFM, *Letter regarding the CGS Market*, July 2012, p. 1.

3.1.3 Spreads between CGS and state government debt

96. In relation to the evidence from semi-government debt markets, the AER accepts the evidence I put that these spreads had widened but fails to address the evidence I put that the widening of these spreads was coincident with (the mirror image of) falling CGS yields.[36] Instead, the AER concludes that the widening in spreads is due to increased foreigner demand for CGS and then refers back to its earlier conclusion that increased foreigner demand for CGS does not invalidate the use of CGS as a proxy for the risk free rate.

> *Increased demand from non-resident investors has also likely had an influence on the increased spreads. Demand from non-resident investors has been proportionately larger in the CGS market over the past few years. The Treasury and AOFM advice notes that non-resident ownership of CGS increased from around 50 per cent in mid-2009 to around 76 per cent in March 2012. The advice also notes that non-resident ownership of semi-government securities has increased in the same period, albeit by a smaller amount. As discussed in section 4.3.2 above, the AER does not consider that increased demand from non-resident investors makes CGS an inappropriate proxy for the risk free rate.*

97. The AER goes onto produce Figure B.3 with both CGS yields and semi-government yields showing that both had fallen (although semi-government debt by less). The AER concludes: [37]

> *This suggests that while semi-government bond yields have not moved in lock-step with CGS yields, the forces acting upon them have been very similar.*

98. I agree with this conclusion. AAA rated state government debt is very safe and is also very liquid (such that state government debt is accepted in fulfilling liquidity obligations under Basel III). It would be amazing if the forces pushing down CGS yields were not also pushing down semi-government yields. However, at no stage does the AER ask whether the more limited decline in state government bond yields vis-a-vis the fall in CGS yields has any implication for the assumption, implicit in the AER methodology, that required yields on (much riskier and less liquid) equities have fallen by the same amount as CGS yields.

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36 The AER does produce its own chart of widening semi-government spreads to CGS but fails to overlay this with the contemporaneous movements in the level of CGS as I do in Figure 2-1: CGS yields and spreads to CGS for NSW Govt. debt [Figure 4 from update report]Figure 2-1 above and as I did in my original report.

37 AER, *Access Arrangement draft decision SPI Networks (Gas) Pty Ltd 2013–17: Part 3*, September 2012, p. 15

3.1.4 Impact of Basel III liquidity rules

99. I also provided evidence that, at the same time as demand from non-resident investors for CGS had increased, financial sector regulatory changes relating to Basel III had also increased demand for CGS from domestic banks. I argued that there was no reason to believe that this would give rise to a contemporaneous reduction in the market cost of equity – even though it would reduce CGS yields.

100. I emphasised the fact that even the next most safe asset in the Australian financial markets, state government bonds, had experienced widened spreads to CGS coincident with periods when CGS yields were at their lowest (as illustrated in Figure 2-1 above, in early 2009 and most recently in mid-20012). I argued that this was strong evidence that the forces driving down required yields on CGS were not driving down required yields on all other asset classes to the same extent. Put simply, if heightened demand for safe/liquid assets is causing risk premiums to CGS for the next most safe/liquid assets to rise by 70bp (and in so doing trebling) then the only reasonable assumption is that risk premiums for the much riskier and much less liquid equity market must be rising by many multiples of this.

101. The draft decision does not address the differential impact on CGS and equity market yields and instead characterises what I said as implying that "*Basel III requirements are placing undue* strain *on the CGS market*" [38] such that its liquidity would be compromised – a proposition that they reject. However, this was not my proposition and in rejecting it the draft decision fails to address the position that I did put.

102. My position was the opposite. Specifically, the liquidity of CGS was the factor attracting investors and driving down yields. If CGS markets were to become illiquid then the very characteristic driving down their yields would disappear and their yields would return to more normal levels – the opposite of what was observed and not something that I had argued.

103. The AER seems to understand that this is my position in the last sentence of the last paragraph on page 10 of Part 3 of its SP AusNet draft decision.

> *The AER does not consider it appropriate to attempt to determine an average, or 'normal', liquidity premium and only accept prevailing CGS when the observed premium is equal to the 'normal' premium.*

104. Here it correctly identifies my view that CGS yields are driven down by a heightened liquidity premium. The AER then rejects adjusting the risk free rate for this (a position I did not put) without addressing the view that the spot MRP will be raised in the context of a heightened liquidity premium because this will lower CGS yields

[38] AER, *Access Arrangement draft decision SPI Networks (Gas) Pty Ltd 2013–17: Part 3*, September 2012, p. 9

but will not lower required returns on equities (a position that I did put). However, in the rest of the section, the AER simply rejects a position that I never put, ie, that the CGS market was not functioning efficiently.

3.1.5 IMF assessment of factors driving down safe asset yields

105. I further note that in the month after I finalised my March report the IMF released a detailed analysis of factors driving down the yields on safe assets worldwide (ie, not just in Australia). The IMF summarised its analysis in the following manner:

> *On the **supply side**, concerns about high government debts and deficits in some advanced economies have reduced the perceived safety of government debt. Recent rating downgrades of sovereigns, previously considered to be virtually riskless, show that even highly-rated assets are subject to risks.*
>
> *The number of sovereigns whose debt is considered safe has fallen. IMF estimates show that safe asset supply could decline by some $9 trillion—or roughly 16 percent of the projected sovereign debt—by 2016. Private sector issuance of safe assets has also contracted sharply on poor securitization practices in the United States.*
>
> *Safe asset scarcity will increase their price, with assets perceived as the safest affected first. Investors unable to pay the higher prices would have to settle for assets that have higher levels of risk..*[39]

And

> *During the crisis, supply-demand imbalances and safe asset market distortions became even more obvious. Large-scale valuation losses on assets perceived as safe, first on AAA-rated tranches of mortgage-backed securities during the crisis, and more recently on some Organization for Economic Cooperation and Development (OECD) government debt, reduced the supply of relatively safe assets. Meanwhile, heightened uncertainty, regulatory reforms—such as new prudential and collateral requirements—and the extraordinary postcrisis responses of central banks in the advanced economies, have been driving up demand for certain categories of safe assets. Hence, safe asset demand is expanding at the same time that the universe of what is considered safe is shrinking.* [40]

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39 SeeIMF summary at: http://www.imf.org/external/pubs/ft/survey/so/2012/POL041112A.htm

40 IMF, Global Financial Stability Report, April 2012, Chapter 3, Safe assets: Financial System Cornerstone.

106. The IMF's detailed analysis[41] was, in my view, entirely consistent with my own analysis. In particular:

- The IMF argued that Basel III (and numerous other regulatory factors) would drive up demand for Government bonds;[42]
- The GFC and European Sovereign debt crises have seen a dramatic reduction in the quantity of assets investors perceive to be safe.[43]

107. The IMF also detailed a number of other factors driving up demand for safe assets not listed by me, such as extensive purchases by central banks engaged in 'quantitative easing' operations. Of course, the basic thrust is the same – none of the analysis by the IMF would suggest that these factors will drive down the cost of risky assets by the same amount as safe assets (and many are associated with the reverse).

3.2 RBA and Treasury/AOFM letters

108. In response to my March report, the AER sought two letters from the RBA and Treasury/AOFM. The draft decision refers to these letters as support for rejecting arguments that CGS is not the best proxy for the risk free rate. However, in my view, these letters provide support for my core contention which is that the factors driving down CGS yields cannot be presumed to be driving down equity yields.

3.2.1 My interpretation of RBA and Treasury/AOFM letters

109. Nothing in the letters contradicts the arguments that I put and, on the contrary, the content of these letters is strongly supportive of my arguments. Specifically:

- Increased demand for CGS is driven by increased levels of risk/risk aversion leading to a 'flight to quality'.
  - RBA paragraph 2 on page 1, first sentence.
  - Treasury/AOFM paragraph 3 on page 1. Also, paragraph 2 under the first question answered on page 2.
- Part of the reasons for this above is the reduced supply of other AAA rated liquid government bonds has led to increased demand from foreigners for CGS.
  - RBA paragraph 2 on page 1, second sentence

41 Ibid. p. 82.

42 Ibid, Box 3.4 on page 100 "Impact of the Basel III Liquidity Coverage Ration on the Demand for Safe Assets"

43 Ibid, especially pp. 81-88 and pp. 105-114

- Treasury/AOFM paragraphs 3 and 4 under the first question answered on page 2.

- Risk premiums for other assets, including but not restricted to equities, measured relative to the CGS have increased as part of the same 'flight to quality'.
  - RBA paragraph 2 on page 1, in particular the last two sentences. Note last sentence:

    "This widening indeed confirms the market's assessment of the risk-free nature of CGS and reflects a general increase in risk premia on other assets."

    I regard this as a clear statement of my central position.
  - Treasury/AOFM final paragraph under the first question answered on page 2.

- As a general rule market risk premia are unstable and adding a fixed MRP to a floating CGS yield cannot be presumed to give accurate results. An important cross-check is provided by asking whether the assumption of a fixed MRP is consistent with the observed changes in risk premiums on debt.
  - RBA last two paragraphs on page 1 (including overleaf to page 2).

110. Notably, the AER interprets last two paragraphs on page 1 of the RBA letter in a different manner than I do above. In order to describe why I believe the AER's interpretation is incorrect, consider those two paragraphs:

> *I therefore remain of the view that CGS yields are the most appropriate measure of a risk-free rate in Australia.*
>
> *That said, market risk premia are unlikely to be stable through time. While it is a reasonably simple matter to infer changes in debt risk premia from market prices, it is less straightforward to do so for equity premia. In making use of a risk-free rate to estimate a cost of capital, it is important to be mindful of how the resulting relativity between the cost of debt and that of equity can change over time and whether that is reasonable.*

111. Noting also for context that the RBA has already said in its letter that there has been a "general increase in risk premia on other assets" (which the RBA does not limit to debt assets). My interpretation of what the RBA is saying is embodied in my paraphrasing below:

> *"Be conscious that market risk premiums are unstable through time. While you can easily and directly measure risk premiums in debt markets and these are rising (as we described above), you can less easily observe risk premiums for equities. However, the natural assumption would be that if risk premiums on debt assets are widely rising then risk premiums on*

equities are as well. Using a historically low CGS as the risk free rate, but applying fixed risk premia for equities, might result in an unrealistically low cost of equity – especially in the context where debt risk premiums have been rising. It would be prudent to be mindful of this relativity given that debt and equity risk premiums are likely to be related."

3.2.2 AER interpretation of RBA letter

112. By contrast, the AER takes a very different interpretation of the RBA letter.[44]

Further, recent advice from the Reserve Bank of Australia (RBA) also touches on the relationship between the cost of debt and the cost of equity.[45] The RBA noted that there was a general increase in the spread between CGS and other Australian-denominated debt securities (i.e. an increase in the DRP). However, the RBA cautioned against directly equating changes in the cost of debt with changes in the cost of equity:

> While it is a reasonably simple matter to infer changes in debt risk premia from market prices, it is less straightforward to do so for equity premia. In making use of a risk free rate to estimate a cost of capital, it is important to be mindful of how the resulting relativity between the cost of debt and that of equity can change over time and whether that is reasonable.[46]

Consistent with this advice from the RBA, the AER is mindful of the relative positions of the cost of debt and cost of equity set in this decision. The AER considers that, since the cost of equity exceeds the cost of debt, this check indicates that the AER's estimates are reasonable.

113. In my view, the above quote from the RBA letter does not provide the full context relevant to its interpretation. The above quote does not include the first sentence of the paragraph from the RBA letter.[47] The AER also does not include the preceding one sentence paragraph which, in my view, is critical to the interpretation of the RBA letter. In short, the following (highlighted) critical introduction to the AER's version of the quote is missing:

I therefore remain of the view that CGS yields are the most appropriate measure of a risk-free rate in Australia.

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44 AER part 3 pp. 99 to 100.

45 This advice is discussed in appendix B.1.1. Source document is RBA, *Letter regarding the CGS market*, July 2012.

46 RBA, *Letter regarding the CGS market*, July 2012, p. 1–2.

47 Which would normally be made transparent by inclusion of "…" at the start of the quote.

> ***That said,*** *market risk premia are unlikely to be stable through time. While it is a reasonably simple matter to infer changes in debt risk premia from market prices, it is less straightforward to do so for equity premia. In making use of a risk-free rate to estimate a cost of capital, it is important to be mindful of how the resulting relativity between the cost of debt and that of equity can change over time and whether that is reasonable.* [Emphasis added.]

114. The first (omitted) sentence of the second paragraph begins with the words "that said", explicitly linking the use of CGS as a risk free rate to the fact that risk premia (measured relative to CGS) are unstable. In the final sentence the RBA cautions, in the context of this instability, the AER to be mindful when setting the MRP of the relativities between debt and equity costs. Earlier in the same letter the RBA stated that:

> *…there has been a widening in the spreads between CGS yields and those on other Australian dollar-denominated debt securities. This widening indeed confirms the market's assessment of the risk-free nature of CGS and reflects a general increase in risk premia on other assets.*

115. Notwithstanding this context, the draft decision would seem to equate the sentence from RBA letter that states:

> *While it is a reasonably simple matter to infer changes in debt risk premia from market prices, it is less straightforward to do so for equity premia.*

with an interpretation that: [48]

> *…the RBA cautioned against directly equating changes in the cost of debt with changes in the cost of equity*

116. I think that this is an unreasonable interpretation of the RBA statement even if that statement was made in isolation. That sentence simply makes the obvious point that yields on debt can be directly observed but this is not the case for equities. There is no obvious 'caution' involved in that factual statement. Moreover, if that was the message that the RBA was trying to convey it would not have followed that sentence with the last sentence of the paragraph – which *is* a direct recommendation to the AER to have regard to movements in the risk premiums on debt when setting the risk premiums on equity.

[48] AER part 3 pp. 99 to 100.

3.2.3 AER claim to satisfy RBA recommendation

117. The AER letter to the RBA attached my report of March 2012 and made clear that it was this report that had given rise to the questions that were being put to the RBA.[49] [50]

> *I am writing to seek your advice regarding current conditions in the market for nominal Commonwealth Government Securities (CGS). This advice is sought in the context of a report the Australian Energy Regulator(AER)is reviewing by Competition Economists Group (CEG) titled 'Internal consistency of risk free rate and MRP in the CAPM' dated March 2012.*

118. It is therefore appropriate to interpret the RBA's reference to the 'cost of debt' and 'debt risk premia' in the context of my report. My report did not have any analysis of the relationship between the cost of debt for an individual firm and the cost of equity for the same firm. My report made the general point in relation to rising risk premia for a range of debt instruments with a particular focus on rising premiums for state government debt precisely because variations in default risk on AAA rated state government could not be explained away by changing default risk (but I also provided analysis of rising premiums for corporate AAA debt, other corporate debt, and the ratio of high to low risk corporate debt).[51]

119. The RBA's statements about being mindful of relativities must be interpreted in the context of my March report that the RBA was asked to review – a report which precisely advised the AER to be mindful of the relativities between the equity risk premium and the risk premium on these debt instruments.

120. Unfortunately, the draft decision's interpretation appears to be simply that the RBA was advising them to make sure that the cost of equity for a regulated business was set above the cost of debt for that business: [52]

> *Consistent with this advice from the RBA, the AER is mindful of the relative positions of the cost of debt and the cost of equity set in this decision. The AER considers that, since the cost of equity exceeds the cost of debt, this check indicates that the AER's estimates are reasonable.*

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49 AER letter to the RBA dated 27 June 2012.

50 Indeed, the AER letter drew the RBA's attention to the fact that I had made numerous references to RBA publications. The AER letter stated "we would appreciate any views you may have on CEG's interpretation of those quotes". The RBA letter is explicitly silent on the question of whether I had correctly interpreted/characterised the RBA publications. However, I note that the letter expresses views consistent with the core of the views that my report contained.

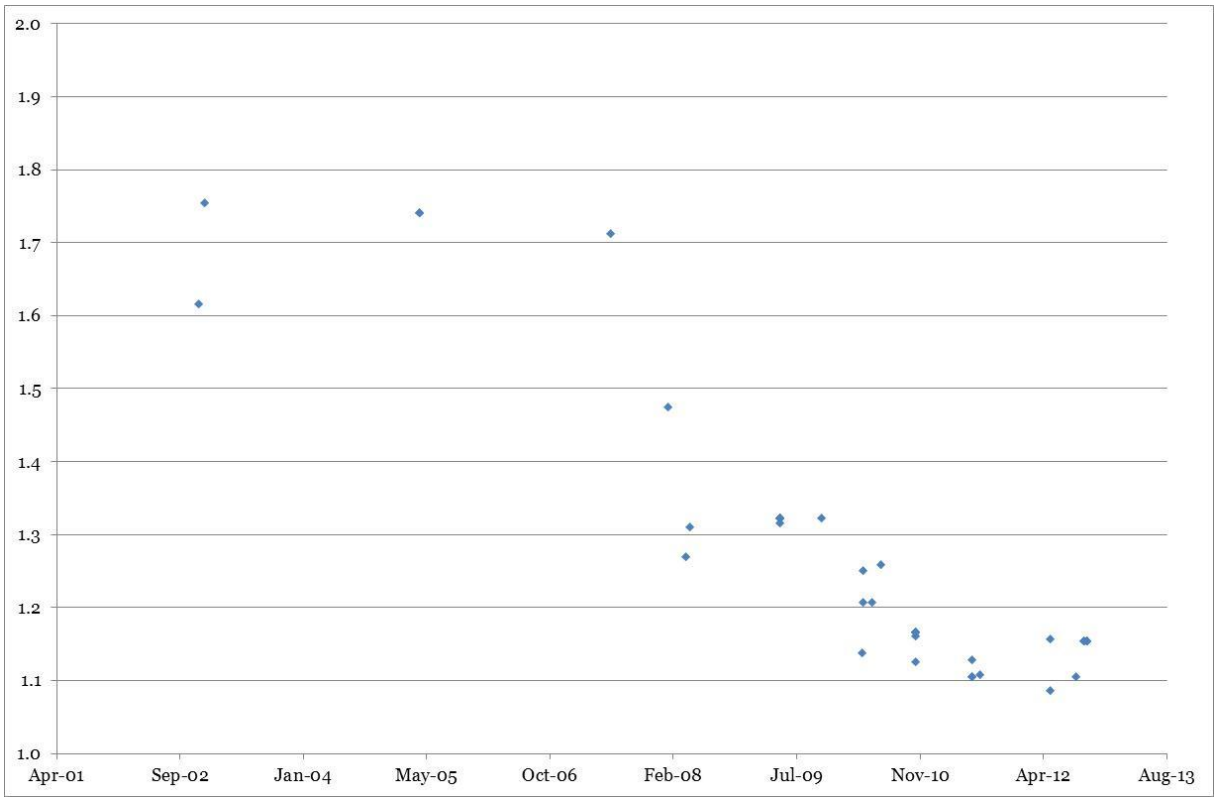
51 See section 4 of my March report.

52 AER part 3 pp. 99 to 100.

121. In my view, such an interpretation is not a correct description of the RBA caution. Even if the RBA letter was referring to relativity between the cost of debt and equity for a single business, it could not reasonably be interpreted as suggesting that all that was necessary was that one was above the other.

122. I agree with the AER that the cost of equity should be greater than the cost of debt, but this is only a necessary and not sufficient to ensure that their relativity is reasonable. I also note that it is striking to consider how the relativity between the AER allowed cost of equity and debt have changed over the last 10 years. The chart below shows the ratio of the cost of debt to the cost of equity for decisions since 2002.

Figure 3-1 Ratio of cost of equity to cost of debt in AER/ACCC decisions



Source: AER regulatory decisions, CEG analysis

3.2.4 RBA statement about rising risk premiums not restricted to debt

123. For completeness, note that the AER states:

> *The RBA noted that there was a general increase in the spread between CGS and other Australian-denominated debt securities (i.e. an increase in the DRP).*

124. The RBA did note this. The RBA also, in the following sentence, stated:

> *This widening indeed confirms the market's assessment of the risk-free nature of CGS and reflects a general increase in risk premia on other assets.*

125. This statement by the RBA is not confined to Australian-denominated debt securities – but would appear to cover all assets including equities.

3.3 Lally critique of CEG DGM analysis

126. Of the AER's experts, only Lally engaged with the DGM analysis that I presented to the extent of suggesting specific amendments. The AER does provide a critique that does not involve any suggested amendments which I address in section 3.7 below.

3.3.1 Lally adjustment to the AMP DGM to arrive at a 7.82% MRP

127. Lally's critique involves suggesting two concrete amendments to the AMP DGM model that I used. The effect of these amendments is to reduce the DGM spot MRP estimate that I arrived at in my March 2012 report from 8.52% to 7.82% (or 0.7%).[53] Lally describes this as a reduction of "around 1.0%" which is the phraseology adopted by the AER in its decision.[54]

> *The third question is whether CEG's MRP estimate of 8.52% from the AMP variant on the DGM approach is a reasonable estimate. I identify two significant errors in this approach and the net effect of them is to overestimate the MRP by about 1%. This is in addition to the overestimation referred to in the previous paragraph.*

128. It is worth noting that the actual correction to one decimal place estimated by Lally was 0.70%. The driver of this adjustment is an assumption by Lally that the value of the firms that make up the ASX 200 (on which the DGM analysis is based) must grow less slowly than GDP because in order to 'make space' for new firms. Lally reaches this conclusion on the basis that:

- if existing firm's dividends do, on average, grow at a pace that equals the growth in GDP; and
- if the value of new firm's dividends (firms not already in existence at the time of the DGM analysis) grows at a constant positive rate; then

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53 Lally, *The Cost of Equity and the Market Risk Premium*, 25 July 2012. Page 19 describes an upward adjustment of 0.37% while page 20 describes a negative adjustment of 1.07% - with the net adjustment of 0.70%.

54 Lally, *The Cost of Equity and the Market Risk Premium*, 25 July 2012, p.33.

- the total value of dividends must grow faster than GDP and, therefore, will eventually account for more than 100% of GDP – which is impossible.

129. I do not accept that this logic establishes a basis for adjusting the AMP DGM methodology to assume that investors expect dividends to grow 1% slower than GDP (specifically that investors expect dividends on the ASX 200 to grow at 1% slower rate than GDP).[55]

130. That said, in the following sections I critique the Lally paper and conclusions 'as if' his suggested adjustments were correct. I show that even if Lally were correct about these adjustments the correct interpretation of his analysis is that the best estimate of the DGM MRP must be materially above 6%. The reasons why I do not accept Lally's downward adjustment to the DGM are set out below.

131. First, to the extent that new firms come into existence at the expense of existing firms, the new firm's capital will be funded via an allocation of capital from existing firms through market processes. For example, new firms will be funded from the proceeds of share-buy backs or other forms of return of capital (reduced reinvestment and consequently higher dividends) from the existing firms that they are replacing. Such return of capital is not captured in the GDP forecast growth of dividends – which is based on the assumption that firms reinvest sufficient funds to continue providing the level of service (measured as a percentage of GDP) that they currently do. If existing firms in aggregate are not growing as fast as GDP then they must not be reinvesting at the level assumed in the DGM analysis which means that at, at least temporarily, their cash payments to shareholders (whether that be dividends or share buy backs) will be in excess of the level assumed in the DGM analysis.

132. Put simply, if existing firms fail to grow with GDP it is because, in aggregate, they fail to invest at a sufficient pace. But this act of reduced investment is the process by which the market allocates capital from those firms to new firms. From the perspective of an investor today, this is not fundamentally different to an existing firm reducing investment in its existing activities and increasing investment in new activities. Whether an existing firm directly funds new activities by reducing investment in existing activities or does so indirectly by giving its investors the savings from reduced reinvestment does not matter. Either way, the investor is given an income stream, net of re-investment of capital in new firms, that grows with GDP.

133. Second, the logic employed by Lally relies on showing an 'impossibility' with a near infinite time horizon. However, the effect of compound discounting in the DGM model is such that beyond 30 or so years the impact of different dividend assumptions is trivial. This is well explained by Capital Research on page 13 and 14

55 The definition of the market used in the DGM analysis.

of a recent report[56] and I will not repeat that analysis. What matters for the accuracy of the DGM analysis is the assumptions about what investors expect to occur over the next 30 to 40 years – not what can or cannot be shown to be impossible over the next 1,000 years.

134. Third, the best forecast of near-term growth in dividends is likely above the long run GDP growth I have used in my model. This is consistent with Capital Research estimates of a 7.0% projection for dividend growth. It is also consistent with the well understood fact that there has been an investment boom in Australia, largely in the mining sector, with much of this investment funded by retained earnings. Consequently, dividends have been sacrificed to fund those investments. In this context, it is reasonable for investors to expect dividend growth to be stronger than GDP as these new investments begin generating income and as payout ratios return to normal levels. For example, analyst forecasts reported by Bloomberg for firms listed on the ASX 200 indicate that dividend growth is expected to be 7.4% and 7.5% for each of the next two financial years.[57]

135. Given the relative importance of near term dividend growth to the DGM analysis I consider that the assumption that dividends grow with long term GDP is conservative.

3.3.2 Lally's basis for not concluding that 7.82% (8.39%) is materially higher than 6.0%

136. Even if I accept Lally's adjustment to the DGM calculations, the resulting estimate of the spot MRP (7.82%) is still well above the 6% MRP being used by the AER. Lally provides no competing estimate that is lower than 7.82%. (I also note that if the Lally amendments were accepted and applied to the CGS yields in the draft decision the MRP estimate would be 8.39%.)[58] It is therefore peculiar that Lally nonetheless concludes on the next page from the above quote:[59]

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56 Hathaway, Forward Estimate of the Market Risk Premium, March 2012, pp. 13-14

57 Based on functions IDX_EST_CURR_YR, IDX_EST_NXT_YR and EST_DVD_FY3_AGGTE as sourced from Bloomberg and applied to the ASX 200 on 6 November 2012. These functions aggregate analyst forecasts of dividends per share across all firms for the ASX 200 to form an indexed forecast of dividends. It is not possible to generate longer term dividend forecasts using this methodology.

58 The average risk free rate in the draft decision is 0.79% (3.77% vs 2.98%) lower than it was in the period my March report was based on (December 2011). Other things equal this implies the MRP will be 0.79% higher. As it happens, other things are more or less equal, with the RBA reported dividend yield at the end of July 2012 only slightly lower (down from 5.1% to 4.9%). This reduces the market cost of equti estimated by 0.22%. . The combined effect of the change in the risk free rate and the change in dividend yields is to increase the MRP by 0.57%. Therefore, the Lally corrected number that is relevant to the draft decision would be only 0.13% lower (0.57%-0.70%) than that in my March report without the Lally adjustment.

59 Lally, *The Cost of Equity and the Market Risk Premium*, 25 July 2012, p.15.

> *…the only remaining issue is whether the MRP for the next ten years has risen in the last year to counteract the fall in the ten-year CGS yield. This is CEG's argument, but the evidence they present in support of it is not convincing.*

137. If one accepts that 7.82% (8.3% at time of writing) is materially more than 6% then, in order for Lally to conclude the evidence is not convincing for a raised MRP Lally must believe the best estimate of the MRP is below 7.82% (8.3%) and potentially as low as 6.0%.

138. For the reasons set out below, it is my view that no reasonably constructed DGM analysis in current market conditions could arrive at a 6% MRP relative to a draft decision risk free rate of 2.98%. Yet, a reader of Lally's report might be left with the impression not only that this is possible but that Lally believes it is the case. However, careful reading of Lally's report provides no such statement from Lally and certainly no such calculation.

139. Indeed, there is only one additional source of adjustment to the AMP method that Lally argues will result in a bias such that the DGM cost of equity overstates the current cost of equity (and therefore overstates the current MRP). This is the argument that Lally is referencing in the last sentence of the first quote above where he states that there are further adjustments beyond those he used to arrive at 7.82%:

> *This is in addition to the overestimation referred to in the previous paragraph.*

140. In this sentence, Lally is referring to what he refers to as CEG's 'perfect offset' hypothesis which Lally claims overestimates the MRP when risk free rates are high (see section 3.2 of his paper for this analysis applied to the AMP method). What Lally describes as a 'perfect offset' hypothesis is more simply described as estimating a single long run DGM discount rate. As I will explain below, Lally's critique would require, if it was to be implemented, the estimation of different near term (10 years) and long run (beyond 10 years) discount rates.

141. Before providing a substantive response I note that, to the extent there is a 'perfect offset' hypothesis embedded in the AMP model's estimation of a single long run discount rate, this is not CEG's hypothesis but is in fact AMP's hypothesis. More generally, in estimating of a single long run discount rate, the AMP model is the same as the standard DGM models used by US regulators and economists[60] –

[60] The AMP model is a version of what is commonly known as the Gordon Growth model after Gordon, Myron J. (1959). "Dividends, Earnings and Stock Prices". *Review of Economics and Statistics* 41 (2): 99–105. The Gordon Growth model requires an estimate of long run dividend growth and the AMP method uses long run GDP growth as the source of this estimate.

including Lally himself in previous advice to regulators including the ACCC[61] and the QCA.[62]

142. Lally calls this a CEG hypothesis but it is a hypothesis that that, until now, he has implemented in his advice to regulators . This DGM analysis where Lally estimated a single discount rate was relied on by the AER to set a 6% MRP in its draft decision for the electricity WACC review.[63] In that decision the AER also relied on the AMP method[64] and a DGM estimate by Davis[65] – all of which employed what Lally now chooses to describe as CEG's 'perfect offset' hypothesis.

143. More substantively, Lally's alleged problem with the standard DGM analysis (and therefore implicitly Lally's past applications of this method) are as follows:

- The standard approach to DGM analysis is to estimate a single long run average discount rate implicit in current market equity prices and dividend forecasts.
- If, in reality, investors are using a very low discount rate for the next 10 years and a very high discount rate for the period after the next ten years then the standard DGM method will overstate the discount rate for the next 10 years (or *vice versa*).
- The reason is that the standard method estimates an average of the near and post-near term cost of equity. By definition this must be an over (under) estimate of the lower (higher) of these.

144. The logic set out in the above two dot points is correct and simple to understand (the presentation Lally provides in section 3.2 of his paper is more technical).

145. However, note that the second dot point above starts with an 'if'. The long term average discount rate only overestimates the cost of equity over the next 10 years *if* the cost of equity over the next 10 years is lower than the cost of equity beyond 10 years. Lally provides no evidence to support such a conclusion. Rather, he simply assumes this is the case and then presents an example which illustrates the result of making that assumption.[66]

146. In doing so, Lally assumes the end point of his analysis. If one starts with an assumption that the current cost of equity is lower than the future cost of equity

61 Lally, The Cost of Capital Under Dividend Imputation. prepared for the ACCC, June 2002.

62 Lally, The Cost of Capital for Regulated Entities. prepared for the QCA, February 2004.

63 See the AER, Explanatory Statement, Review of the weighted average cost of capital, December 2008, pp.172 to 173.

64 Ibid.

65 Ibid.

66 Lally, *The Cost of Equity and the Market Risk Premium*, 25 July 2012, p.16.

then it is to be expected that you arrive at a lower estimate of the current cost of equity than the standard approach to DGM (ie, an approach that assumes there is a single long run cost of equity that is being estimated).

147. This is, in my view, sufficient grounds to reject the basis on which Lally concludes that 7.82% (or 8.3% at the time of the draft decision) is not substantially more than 6.0% (ie, that CEG's evidence is '*not convincing*').

148. However, there are equally strong separate grounds on which to reject Lally's critique. The first is that it is built on an assumption that it is desirable to break the future up into different time periods and to estimate different discount rates that apply to each of these periods. Even if this were possible (see next grounds for rejection) it is not obvious that this would be desirable. Such an approach would necessarily inject uncertainty and complication into regulatory assessments and would not be consistent with standard regulatory practice either in Australia or overseas. Similar sentiments were expressed by the Tribunal in ATCO gas.[67]

149. Secondly, implementing Lally's critique turns one DGM variable (the long term discount rate) into two variables (the near and post near term discount rate). The effect of this is that there are two unknowns but only one equation – making the DGM impossible to solve unless an assumption is made about one of these two variables.

150. This may be why Lally only illustrates his critique with examples where he assumes the near and long term discount rates are known (eg, see the example in section 3.2). If Lally actually tried to estimate the near term discount rate (which he assumes is what the regulator should be interested in) then he would have to make an assumption about what the post near term discount rate would be. Of course, the post near term discount rate is unknown – making such an approach impossibly speculative.

151. Any attempt to estimate either discount rate would lay bare the fact that this requires an assumption about the other discount rate – ie, that the final result is assumed by the operator rather than estimated from market data. In this regard I note that Lally does not actually develop an estimate of the near term MRP in his report and the practical difficulties of doing so with his 'two discount rate' model may be why. Rather, Lally adjusts my estimate to be 7.82% and then refers back to his illustrative examples in section 3.2 in order to justify a conclusion that this 7.82% estimate is *not convincingly* different to 6.0%.

152. However, I think it is instructive to use Lally's two discount rate model to perform 'what if' analysis. Specifically, I have used the equations on page 16 of Lally's report to ask what the post 10-year cost of equity would have to be if the AER draft decision cost of equity for the market were an accurate estimate of the cost of equity

67 Application by WA Gas Networks Pty Ltd (No 3) [2012] ACompT 12 (8 June 2012), para 92.

over the next 10 years. The result of this analysis provides the third grounds for rejection of Lally's conclusion.

153. I ask what the post 10 year discount rate must be if the AER's assumed risk free rate and MRP in the draft decision is how investors are currently discounting the next 10 years. When I do this I find that equity holders would have to be applying a 13.4% discount rate to dividends received beyond 10 years (calculations provided in Appendix A). This is the discount rate that would have to be in place if the discount rate over the next 10 years was 8.98% (the AER's 2.98% risk free rate plus a 6% MRP).

154. That is, Lally's formulas on page 16 imply that:

- if the AER's estimated market cost of equity in the draft decision (8.98%) is a correct estimate of the 10 year discount rate; then
- it is necessary that investors expect the cost of equity after 10 years to jump[68] by 4.42% to 13.4% after 10 years.

155. In order to believe this is really the case, investors now must be expecting real returns on the market post 10 years to be permanently much higher than earned in history.[69]

156. Moreover, an assumed 13.4% cost of equity beyond 10 years is inconsistent with an assumption that investors apply an MRP of 6% beyond 10 years. Unless investors are expecting the risk free rate beyond 10 years to jump[70] to 7.4% it is not possible to justify a 6% MRP over the next 10 years without assuming an above 6% MRP beyond 10 years. That is, Lally's critique to justify the possibility of a 6% MRP can

68 I use the word 'jump' here advisedly. If the discount rate only gradually increased after 10 years its final 'resting place' would need to be even higher than 13.4% in order to justify current market valuations (and the assumed 8.98% discount rate over the next 10 years).

69 The nominal average return on the market since 1958 is only 11.51% (or since 1902, 10.77%). This is despite the fact that average inflation since 1958 and 1902 respectively was much higher (5.1% and 3.9% respectively) than the 2.5% assumption which underpins the 13.4% DGM figure. The above figures are geometric averages which is the correct basis to compare them to the DGM model which applies a compounding (geometric) discounting. That is, the post 10 years 13.4% nominal return on the market estimated is a geometric average. Historical market return data is taken from Handley, An Estimate of the Historical Equity Risk Premium for the Period 1883 to 2011 , April 2012.

70 Again, I use the word 'jump' here advisedly. If the discount rate only gradually increased after 10 years its final 'resting place' would need to be even higher than 13.4% in order to justify current market valuations (and the assumed 8.98% discount rate over the next 10 years). This means that the average expected risk free rate beyond 10 years would need to be higher still if investors were applying a 6% MRP beyond 10 years.

only apply to one period. In order to justify an MRP of 6% over the next 10 years Lally must assume an MRP of above 6% beyond 10 years.[71]

157. A comparison of the real rates of return in the two periods implied by Lally's equations is striking. Given the 2.5% inflation expectations assumed in the DGM model, the AER's 8.98% nominal cost of equity implies the real discount rate for the next 10 years is 6.3%. A 13.4% nominal discount rate beyond that date implies a real discount rate of 10.6%. That is, a 68% per cent increase in the real discount rate is required beyond 10 years in order to be able to claim the AER's real discount rate for the next 10 years is correct.

158. Neither Lally nor the AER provide any evidence to suggest that the cost of equity will increase beyond 10 years let alone increase by a factor of 68%. It would imply that the currently historically high cost of equity being produced by the AMP DGM method, as evidenced in Figures [6-8] of my update paper, is elevated:

- not because investors are demanding a higher than normal return now; but rather
- because investors are demanding a lower than average return in the near term but expecting to demand a much higher return than the historical average[72] beyond 10 years.

159. While this is conceivable, in the same sense that anything not ruled out as impossible is conceivable, it is entirely another thing to plausibly and reasonably assume that this is the case.

160. For the reasons set out above, I consider that Lally's conclusion that the AMP DGM estimates are not convincing evidence of a spot MRP above 6% should be set aside. Properly used to actually test the AER's cost of equity estimate, Lally's analysis adds to the evidence that the spot MRP is above 6% rather than weakening it.

3.3.3 Lally's claim that CEG's method is 'predisposed' to find CEG's conclusion

161. In light of the above analysis I note the following statement by Lally which is also relied on by the AER draft decision.[73]

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[71] This should not be a surprise. Lally attempts to dismiss the higher long term average cost of equity from the DGM on the basis that investors might have two discount rates – one low discount rate for the near term and one high discount rate for the long term. But clearly, if one is below the average the other must be above the average. If the long term average MRP is above 6% but the next 10 years is equal 6% then the average beyond 10 years must be above 6% - unless one assumes that investors are anticipating permanent above average risk free rates beyond 10 years.

[72] In relation to Figure 8 of my update paper this statement refers to the average of AMP method DGM discount rates since 1993. However, the same statement is also true in relation to historical average realised returns as described in the above footnote.

The first of these questions is the validity of CEG's claim that there is a clear negative relationship between the ten year CGS yield and the ten year MRP to the extent that the ten-year cost of equity is stable over time, and therefore recent reductions in the ten-year CGS yield do not reduce the ten-year cost of equity.

I do not consider that CEG present any persuasive evidence that there is a strong negative relationship of this kind and the primary evidence they do present in their Figure 8 is pre-disposed to that result by assuming that the future cost of equity is the same for all future years.

162. In my view, it is Lally's critique that is predisposed to a particular conclusion. Indeed, Lally's critique is not just predisposed to finding a different conclusion it actually assumes a different conclusion.[74]

3.3.4 Market prices for equity might be wrong

163. In section 3.2 of his paper, Lally argues that a potential source of error in the MRP estimate that flows from the DGM analysis is that market prices for equity might be wrong.[75]

Secondly, this methodology assumes that the current value of equities matches the present value of future dividends. Consequently, if the current value of equities exceeds the present value of future dividends, then the estimate for the market cost of equity (and hence the MRP) that arises from this methodology will be too low. Similarly, if the current value of equities is below the present value of future dividends, then the estimate for the market cost of equity (and hence the MRP) that arises from this methodology will be too high. To illustrate the possible extent of the errors, suppose that the current value of equities is 25% below the present value of future dividends. In addition, consistent with CEG, suppose that the expected growth rate in dividends is 6.60%, the current dividend yield is 5.68%, and the current ten year risk free rate is 3.77%. These parameters in conjunction with equation (2) imply that the MRP is estimated at 8.89%. However, if the current value of equities matched the present value of future dividends rather than being 25% below it, the estimate of the MRP would have been 7.37%, and therefore

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73 Lally, *The Cost of Equity and the Market Risk Premium*, 25 July 2012, p.3 and p.33

74 A more reasonable description of what can be said about Lally's analysis would require this statement to be reworded along the lines: "*CEG has demonstrated strong evidence of a negative relationship between MRP and risk free rate where the MRP is defined as the forward looking long run average cost of equity minus the 10 year CGS yield. However, it might be that the near term cost of equity is different (lower or higher) than the long term cost of equity. In which case, it is possible that what is true for the long term cost of equity might not be true for the near term cost of equity*."

75 Lally, *The Cost of Equity and the Market Risk Premium*, 25 July 2012, p.12.

it would have been overestimated by 1.52% as a result of the market valuation error.

164. Lally makes no claim that current equity prices are undervalued and therefore makes no claim that this is a source of error in the DGM estimates. He only raises the possibility that this might be the case.

165. However, if one accepts this as a problem with DGM analysis then one must also accept it as a problem with estimates of the 10 year CGS rate. Both rely on inference from market prices. If market prices are unreliable then both estimates are unreliable.

166. I do not accept this as a problem that requires addressing. The current valuation of equities and government bonds reflects investors' risk perceptions. These risk perceptions might be transitory or even irrational but they are what they are. Using market prices (be it equity or bond prices) in the analysis involves attempting to measure what required returns *are* not what somebody might believe that they *should be*.

167. For completeness, I also note that:

- Lally raises one further critique of the DGM analysis which is that companies as a whole are not reinvesting enough to maintain dividend growth in line with GDP. Again, Lally raises this as a possibility rather than showing that this is the case; and
- Lally argues that because my historical application of the AMP method results in a slightly negative MRP in 1994 the entire analysis is unreliable. I show in section 3.3 of the update report that this negative estimated MRP in October 1994 was due to inflation expectations at that time being in excess of the assumed 2.5% used in my calculations. That is, when applying the DGM backwards through time, I assumed for simplicity that inflation expectations were always 2.5%. When I correct for this by using all real parameters (indexed CGS and real dividend growth rates) I do not need to make an assumption about expected inflation. Once this is done, there are no negative MRP estimates, but the overall historical trends that I rely on to conclude a negative relationship between the risk free rate and the MRP remain the same.

3.4 Lally critique of state government debt spread data

168. Lally also argues that evidence from increasing spreads on state government debt, which I argue provides mutual corroboration for the DGM analysis, is not convincing.

Thirdly, CEG (2012, paras 46-63) describes the general increase in debt risk premiums on non-CGS bonds contemporaneous with the recent decline in the

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risk free rate, which is uncontroversial, and claims that "standard finance theory" would support an increase in the MRP of at least that in debt risk premiums. Subsequently, CEG (2012, para 96) explain this with an example involving Victorian government debt, for which the debt risk premium increased from 0.51% in 2011 to 0.80% in 2012. Assuming an MRP of 6.0% in 2011, CEG claim that the debt risk premium in 2011 of 0.51% implies a debt beta of 0.09, and coupling the same debt beta with the 2012 debt risk premium of 0.80% implies a 2012 MRP of 9.0%. However, these results are only true if the cost of debt is both an expected rate of return and the margin over the risk free rate is compensation for only systematic risk, and both conditions are false. In particular, the cost of debt is a promised rate of return and this exceeds the expected rate of return by the expected default losses (DF). Furthermore, the expected rate of return on state government debt is likely to incorporate an allowance for inferior liquidity relative to CGS (LIQ). Thus the debt risk premium (DRP) can be expressed as

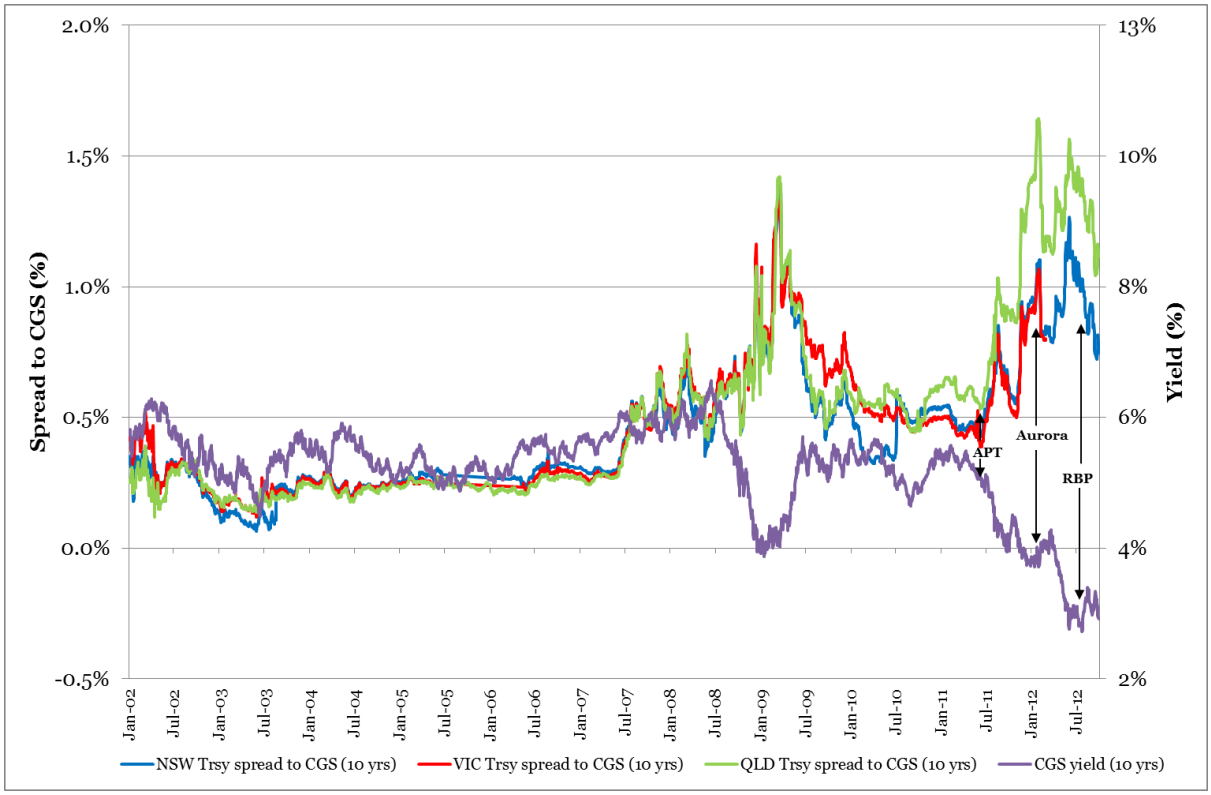
$$DRP = MRP\ \beta_d + DF + LIQ$$

where β_d is the debt beta. Accordingly, the rise in the debt risk premium on Victorian government debt from 0.51% in 2011 to 0.80% in 2012 may have been due entirely to increases in DF and LIQ, in which case one cannot conclude that the MRP rose. ***Remarkably, CEG (2012, para 55) refer to the rise in the debt risk premium for state government debt and attribute this to a "heightened safety/liquidity/scarcity premium for CGS", which seems to involve acknowledging that DF and LIQ might have risen. Thus, the evidence presented by CEG for a rise in the MRP is not compelling, there are credible alternative explanations, and even CEG elsewhere acknowledge these alternative explanations.*** *[Emphasis added.]*

169. Lally's equation summarises his logic. Lally states that the spread between state Government debt and CGS can be decomposed into three elements: compensation for the expected loss from default (DF); compensation for CAPM risks ($MRP\ \beta_d$); and compensation for liquidity risk (LIQ). Lally argues that DF is not compensation for risk because it is simply an actuarial assessment of likely losses from default. Therefore, changes in DF need not imply changes in risk compensation. I accept that this is the case for the purpose of responding to Lally's argument.

170. However, I do not accept that changes in expected default by state governments have any role in explaining the pattern of changing spreads to CGS exemplified in, for example, Figure [3] of my update paper – reproduced below.

Figure 3-2: Figure [3] from update report. 10 year risk premium on state government debt against 10 year yields on CGS



Source: Bloomberg, RBA, CEG analysis
Note: Bloomberg discontinued the Victorian Treasury curve at the end of February 2012

171. Lally's critique amounts to raising the possibility of an issue but no investigation of its actual relevance is undertaken. I am aware of no evidence that would support a conclusion that, in late 2011, there was a sudden increase in the expected default by Australian State Governments such that this risk reached a peak in mid 2012. Certainly, no credit rating agencies signalled this as an issue or changed their ratings at that time. I am, however, aware of events in Europe that are widely accepted as increasing demand for the safest and most liquid assets worldwide. As described by RBA Governor Stevens:

> *We saw one such one bout of anxiety in the middle of this year when financial markets displayed increasing nervousness about the finances of the Spanish banking system and the Spanish sovereign.*
>
> *The general increase in risk aversion saw yields on bonds issued by some European sovereigns spike higher; while those for Germany, the US and the UK declined to record lows. This flight to safety also saw market yields on Australian government debt decline to the lowest levels since Federation.*

> *Meanwhile many European economies saw a further contraction of economic activity and share markets decline sharply.*[76]

172. This leaves two further components of the spread which Lally divides up into CAPM risk and liquidity risk. Lally argues that increases in spreads between state government debt and CGS yields could be due to liquidity risk and therefore have no relevance to an assessment of the perceived riskiness of equities. Lally finds it remarkable that I would draw attention to rises in liquidity premiums in financial markets in support of a view that risk premiums to liquid CGS have risen.

173. In doing so, Lally is working on the assumption that increasing liquidity premiums have no effect on risk premiums for equity. Lally takes this as a given but does not explain why he adopts this view. Lally's statement is, in my view, the truly "remarkable" one.

174. The spread between CGS and required equity returns (ie, the MRP) is affected by anything that affects investors' required yields on one asset but not the other. CGS are the most liquid assets in the Australian economy, state government debt is the second most liquid[77] and shares in listed companies are much less liquid than either of these. If spreads to CGS for state government debt have been driven up by over 100 basis points due to a heightened liquidity premium then spreads to CGS for equities (ie, MRP) will have been driven up by multiples of this. Of course, this increase in spreads (relative yields) has largely been achieved by a fall in CGS yields rather than requiring a large increase in absolute required yield on equity.

175. Unless Lally believes that heightened liquidity premiums drive down equity yields by the same amount as CGS (and more than state government debt). I find it difficult to understand Lally's apparent surprise that I refer to heightened liquidity premiums as a reason that equity premiums relative to CGS have risen.

176. The only alternative explanation that I can imagine, and which is suggested by Lally's equation where he separates beta risk from liquidity risk, is that Lally is arguing that liquidity premiums are not part of the CAPM and therefore must be ignored in a regulatory context when using the CAPM.

177. This is incorrect on both grounds. In the CAPM the MRP compensates for all risks investors are exposed to on the market portfolio. One can name the determinants of these risks separately (eg, inflation risk, interest rate risk, liquidity risk, recession risk, etc.) but that does not make them fall outside the CAPM. The MRP is the all-encompassing term for the compensation required for bearing all of these risks.

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76 Glenn Stevens, *Opening Statement to the House of Representatives - 24 August 2012 - Hansard script*, p. 2.

77 These are the only assets recognised as satisfying the liquidity requirements of Basel III (along with the committed liquidity fund created by the RBA due to a lack of liquid assets).

Lally's basis for separating out liquidity risk from the MRP in his equation is unfounded.

178. Finally, if one did believe that some risks that affected market prices and yields were somehow 'outside' a particular assumption of what was 'in' a particular version of the CAPM this would not be a basis for failing to compensate those risks. It would be a basis for adopting a version of the CAPM, or some other model, that was better able to describe the determinants of risk premiums.

3.4.1 The AER's reliance on Lally

179. The AER states that:[78]

> *The rise in the expected rate of return on state government debt might have been due entirely to increases in expected default losses and liquidity premium relative to CGS yield. In this case, the MRP would not increase with the debt risk premium.*

180. The AER appears to simply be following Lally in this regard. No justification is provided for why liquidity premiums do not affect the required return on equity relative to CGS (ie, the MRP). I simply repeat my response to Lally above.

3.5 Consistency with present value principle

181. In its rejection of a risk free rate estimated as an historical average, the AER relies upon advice provided by Professor Lally that the use of such an estimate would not be consistent with the 'present value principle'.[79] The AER states:[80]

> *A short average period provides a reasonable estimate of the prevailing rate while not exposing service providers to unnecessary volatility. It is a pragmatic alternative to using a risk free rate that precisely ensures the present value principle holds. The rate of return must be estimated in a manner consistent with not only that principle, but also the building block model and the CAPM. Lally stated all three require a risk free rate estimated at the beginning of the regulatory period – literally, the first market price on the first day of the regulatory period.* [footnotes omitted]

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78 AER, *Access arrangement draft decision: SPI Networks (Gas) Pty Ltd 2013–17: Part 2 Attachments*, September 2012, p. 177.

79 See: AER, *Access arrangement draft decision: SPI Networks (Gas) Pty Ltd 2013–17: Attachments*, September 2012, pp. 147, 154-155; and AER, *Access arrangement draft decision: SPI Networks (Gas) Pty Ltd 2013–17: Appendices*, pp. 19-20

80 AER, *Access arrangement draft decision: SPI Networks (Gas) Pty Ltd 2013–17: Attachments*, September 2012, p. 155

182. Lally's paper is useful in that it clearly sets out the conceptual objective under which a spot discount rate needs to be used. That objective is encapsulated in what Lally describes as the 'present value principle' but which I will prefer to describe as 'the present value principle in the averaging period' for reasons I explain below.

183. Specifically, the objective is to set a regulatory rate of return that is equal to investor's spot cost of capital at some time 't' (the averaging period) close to the beginning of the regulatory period. If this is successfully achieved (and if other elements of the regulatory allowances are accurate) then investor's valuation of the regulated cash-flows at time 't' will be equal to the value of the regulatory asset base. As Lally states:[81]

> *...present values always involve the use of the current risk free rate rather than an average over some historical period, and current in a regulatory context means at the beginning of the regulatory period.*

184. I agree with Lally that if one wants to value a future income stream at a point in time then one needs to use the spot discount rate that applies at that time. Of course, this requirement does not stop at the spot risk free rate, it applies equally to the risk premium above the risk free rate. That is, achieving the present value principle in the averaging period requires the risk free rate and the risk premium to be spot estimates reflecting conditions specific to the averaging period.

185. Lally does not make this conclusion explicit because the nature of the task he sets himself does not require it. All Lally's examples and analysis are performed assuming that the regulated cost of equity is risk free – such that investors only ever demand a return equal to the risk free rate. Setting the problem up in this way, it is not necessary for Lally to explicitly say anything about how the analysis applies to the MRP because he has assumed away the relevance of the MRP.

186. However, if one works through all of Lally's examples but, instead of assuming that equity is risk-free, one assumes that equity has some risk then all of the conclusions that Lally arrives at apply equally to the MRP. Specifically, in order to achieve the present value principle in the averaging period one must adopt both a spot risk free rate and a spot MRP based on the short-term market conditions applying in that averaging period.

187. In this regard, Lally's paper is perfectly consistent with the adoption of 'Option 1' described in section 2.4 above. Namely, the consistent combination of a spot risk free rate and a spot MRP in applying the CAPM.

188. That said, in my view Lally is wrong to implicitly state that this is the overriding objective of regulation (or, at least, for setting a regulated rate of return). This

[81] Lally, *The Risk Free Rate and the Present Value Principle*, Page 7.

objective might, if implemented successfully, result in the return to investors being set more accurately in the averaging period but less accurately at other times.

189. Indeed, this appears to be an important reason why the AER does not wish to set the MRP based on market conditions in the averaging period – because it appears to believe that whatever those conditions are the MRP in the future will revert to a historical average level. Therefore, even if the MRP were heightened in the averaging period, this would not be a good estimate of the MRP over a longer horizon and it is this that the AER believes it should estimate.

190. The Australian Competition Tribunal applied the same logic to the risk free rate in EnergyAustralia. In that decision the Tribunal determined that the risk free rate in the averaging period proximate to the beginning of the regulatory period was not a good proxy for the risk free rate likely to prevail over the regulatory period.[82] The AER refers to this Tribunal precedent in its SP AusNet draft decision but rejects its relevance (again, without querying whether the logic for rejecting this precedent applies equally to its logic for adopting a forecast of MRP rather than the spot MRP).[83]

191. I would characterise Lally's presumed objective as setting a rate of return consistent with achieving the present value principle once every five years during the relevant averaging period. If this is the objective then only information on market conditions in the averaging period is useful or relevant. I would characterise the alternative objective as setting a rate of return consistent with attempting to achieve the present value principle on average over the life of the regulated business. If this is the objective then using historical averages from outside the averaging period may be useful and relevant.

192. It is not, in my view, obvious that the first objective is superior to the second.

193. I also note that in practical terms it is not obvious that the regulatory regime can achieve the first objective. One of the AER's reasons for not adopting a spot estimate of the MRP is that it is too difficult to do so. Given the importance of the risk premium to the investor's discount rate, if this is true then Lally's argument for adopting the spot risk free rate in the averaging period breaks down. If you can't measure a key determinant of the spot discount rate then the justification for adopting a spot risk free rate is called into question – even if the objective is to *achieve the present value principle in the averaging period*.

194. In this situation it may be better to estimate the long run average cost of equity even if you would ideally prefer to know the spot cost of equity. Indeed, the best estimate

82 See discussion in Section 6.1 of my March report.

83 Section B.1.5 of AER, *Access arrangement draft decision: SPI Networks (Gas) Pty Ltd 2013–17: Part 3*, September 2012.

of the spot cost of equity may be the long run average cost of equity if the spot MRP really is too difficult to estimate.[84]

195. Similarly, Lally's simplified example without any equity risk or debt issuance glosses over a large number of both theoretical and practical difficulties that mitigate against arriving at a definitive conclusion. For example, in the model proposed by Lally, the only measure of the risk free rate that would be consistent with the present value principle is the 5-year (the length of the regulatory period) spot risk free rate prevailing on the first day of the regulatory period.

196. However, it is neither AER regulatory precedent nor standard regulatory practice to attempt to estimate a discount rate that matches the length of the regulatory period. In my view, this is for the very good reason that the conclusion based on a model where investors view regulated equity as a perfect substitute for risk free government debt does not hold in a more realistic model.[85]

197. Similarly, one cannot extend Lally's analysis to risky assets in the Sharpe Lintner CAPM in a straightforward manner. The Sharpe Lintner CAPM is a model derived on the basis of an assumption of a single period.[86] Lally's model is one that has many consecutive consequential periods defined by the length of each regulatory period. Such a problem set up requires the use of the inter-temporal (or multi-period) CAPM[87] which includes accounting for re-investment risks as well as beta risk (as defined in the Sharpe Lintner CAPM).

198. Overall, Lally's reasoning is simultaneously highly simplified and highly theoretical. In my view, this style of analysis is at risk of finding the exact right answer to a question that is not relevant to a policy maker. Or, perhaps equally likely, finding no right answer as competing simplified but highly theoretical models are argued over (such as which version of the CAPM to use).

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84 Put another way, if you have all the ingredients for sponge cake but only half the ingredients for Christmas pudding it is not necessarily sensible to try and make Christmas pudding with the sponge cake ingredients – even if you would ideally prefer Christmas pudding.

85 For one thing, the benchmark businesses must issue 60% debt (Lally's example assumes zero debt issuance) and issuing short term (5 year) debt creates risks – including exposure to refinancing risk. Research that I have done suggests that no regulated business that has access to capital markets issues such short term debt. For example, see CEG, Review of updated input methodologies A report for Vector, November 2010, Appendix B.

86 That is, the derivation of the CAPM assumes that all investors invest their entire wealth at the beginning of the period, wait until the end of the period (with no trading within the period) after which they sell their entire investment and consume their entire wealth

87 First developed by Merton (Merton, R.C., An Intertemporal Capital Asset Pricing Model, Econometrica, Vol 41, No. 5. (Sep., 1973), pp. 867-887) and commonly described as the Merton CAPM or the consumption CAPM.

199. Lally himself recommends varying from the conclusions of his model by having regard to a short averaging period in determining the risk free rate that is set some time before the exact beginning of the regulatory period.[88] In relation to other parameters, the AER has varied from conclusions explicit and implicit in Lally's model by:

- selecting a risk free rate based on 10 year CGS yields, rather than 5 year CGS yields; and
- estimating MRP as an historical average which is representative of expectations of the future, rather than measuring the spot MRP implied by market conditions immediately prior to the beginning of the regulatory period.

200. In my view, it is not reasonable for the AER to gives such significant weight to Lally's analysis to reject an historical risk free rate on the grounds when the AER ignores Lally's analysis when it comes to setting a spot MRP and adopting a 5 year risk free rate.

3.6 CEG motivation for historical average risk free rate

201. The AER expresses the view that CEG's basis for proposing a risk free rate based on an historical average is to fix a perceived problem with the MRP. The AER's contention is that the risk free rate and the MRP should be considered separately. The AER states:[89]

> *The AER uses the CAPM to estimate the cost of equity to determine the WACC under rule 87(2) of the NGR. The MRP, like the risk free rate, is an input to the calculation of the cost of equity for that WACC. Maintaining the integrity of each parameter promotes rigour and robustness in the estimation of each*

88 Lally states:

> *In summary, the Present Value principle requires use of the risk free rate at the beginning of the regulatory period. Literally, this involves the first market price on the first day of the regulatory period. However, the use of this transaction would expose the regulatory process to reporting errors, an aberration arising from an unusually large or small transaction, and a rate arising from a transaction undertaken by a regulated firm for the purpose of influencing the regulatory decision. These pragmatic considerations imply that the rate should be averaged over a short period as close as practical to the start of the regulatory period. Rates averaged over a much longer historical period would be inconsistent with the Present Value principle, i.e., they would violate it without offering any incremental pragmatic justification.*

It is not obvious to me how Lally simultaneously justifies a departure from his ideal scenario of measuring the risk free rate on the first trade of the first day of the regulatory period but constrains this departure to "*a short period as close as practical to the start of the regulatory period*".

89 AER, *Access arrangement draft decision: SPI Networks (Gas) Pty Ltd 2013–17: Attachments*, September 2012, p. 172

> *parameter. But addressing a problem with one parameter by adjusting another parameter introduces subjectivity.*
>
> ...
>
> *For the reasons set out in this decision, the AER considers a 6 per cent MRP reflects prevailing conditions in the market for funds and also the risks from providing reference services. However, even if this was not the case, the AER considers (for the reasons outline* [sic] *above) adjusting the risk free rate to address a perceived problem with the MRP would not be appropriate.*

202. This is not an accurate depiction of the motivation for a risk free rate based on an historical average. The primary motivation for a risk free rate based upon an historical average is internal consistency with the AER's continued reliance upon an MRP that is based itself upon an historical average.

203. The NGR requires estimates of the rate of return to be prevailing. To the extent that the AER continues to represent its estimate of the MRP as prevailing, it is unclear how it could consistently view a risk free rate estimate based on an up-to-date historical average as an estimate that is not prevailing. Consistency with the NGR and the NGL is discussed in greater detail at section 2.6 above.

204. Using an historical risk free rate does not 'address a problem' with the MRP. By achieving consistency with the MRP, the sum of the two results in an estimate of the market cost of equity that is coherent and representative of an average market cost of equity in the past. This is also a prevailing forward looking estimate, to the extent that what has happened in the past influences expectations of the future.

205. The fact that the market cost of equity estimated using historical averages for the risk free rate and the MRP is similar to the market cost of equity estimated using current spot rates for the risk free rate and the MRP provides confidence that this is a reasonable forward looking estimate of the market cost of equity, and that the market cost of equity may not be as volatile as each of its components.

3.7 Alternative measures of the historical average risk free rate and IPART regulatory precedent

206. The draft decision argues that any long term averaging period for the risk free rate is arbitrary with no long term averaging period clearly superior for use over another.[90]

> *The possibility of upward bias also applies to a long term average. Determining the averaging period for a long term average introduces arbitrariness, and no long term averaging period is clearly superior for use.*

[90] AER, *Access arrangement draft decision: SPI Networks (Gas) Pty Ltd 2013–17: Attachments*, September 2012, p. 156.

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The AER does not consider historical estimates are needed in this case, because a proxy for the risk free rate is readily available. It thus considers a short averaging period, determined in advance, minimises the likelihood of bias.

207. I agree that there is an element of arbitrariness choosing the period over which any long term risk free rate average is measured. I also note that the same is true of historical average MRP estimates and even the selection of the short term averaging period. Indeed, as I point out in my update paper, a choice of averaging period a few months apart can and has had dramatic impacts on regulated businesses compensation. The most recent 2012 Powerlink and RBP averaging periods are only four months apart but have risk free rates that are 122 basis points different.

208. That is why in my March report I selected the longest period over which the RBA regularly reports yields for CPI indexed CGS. I chose to focus on real (CPI indexed) CGS yields because it is the expected real CGS yield that is relevant to an application of the CAPM and this is the most direct estimate of the historical average expected real yield.

209. However, there are only 18 or so years of data available for this yield series. Historical average MRP estimates are generally taken over a much longer time period (although exactly what time period is embodied in the AER's 6% estimate is unclear). There are other alternative estimates of the historical average 10 year CGS yield that are based on a longer time series of nominal (non-CPI indexed) CGS bonds. However, any such estimate must be associated with an estimate of investors' concurrent expected inflation if the prevailing real expected return on CGS is to be estimated.[91]

210. I have derived real historical risk free rate estimates from nominal CGS and then reflated these to nominal terms assuming a forecast of inflation of 2.5% (consistent with the draft decision).

211. However, I have employed two different methods to derive real estimates from nominal rates. One method involves deducting the actual CPI inflation in an individual year from the nominal CGS yield in that year (nominal CGS yields are taken from Handley[92]). A weakness of this approach is that investors may not have expected the actual CPI in the relevant year (and, even if they did, need not have believed that this rate would prevail over the 10 year life of the bond).

212. Fortunately, the Commonwealth Treasury and the ABS have published a time series for expected 10 year inflation that is used in the treasury macroeconomic model

91 Which can then combined with a prevailing inflation expectations today in order to arrive at a nominal rate today that delivers the estimated historical real yield.

92 Handley, An Estimate of the Historical Equity Risk Premium for the Period 1883 to 2011 , April 2012.

(TRYM).[93] I consider that using an estimate of expected inflation is likely to result in a more accurate estimate of the real risk free rate investors expected. This series extends from June 1959 to June 2011.

213. The resulting average expected real 10 year CGS rate from 1959 derived using this estimate of inflation expectations and the Handley CGS series is 3.7% - which translates to a 6.3% nominal rate at 2.5% expected inflation. This is similar to, but above, the 6.0% proposed in my March report (based on CPI indexed CGS from 1993 to 2011). By comparison, over the same period the actual real CGS yield (calculated by deducting actual inflation in each year from CGS yields in that year) was 2.7%. When this is reflated using a 2.5% expected inflation it results in a 5.3% nominal rate.

Table 3-1 Nominal and real equity market returns and government bond yields since 1883

Period	Average indexed bond yield*	Average nominal govt. bond yield	Average actual inflation	Average real bond yield (actual)	Reflated using 2.5% expected inflation	Average expected inflation (TRYM)	Average expected real bond yield (TRYM)	Reflated using 2.5% expected inflation
1883 - 2011	n.a.	5.6%	n.a.	n.a.			n.a.	n.a.
1902 - 2011	n.a.	6.0%	4.0%	2.1%	4.7%		n.a.	n.a.
1959 - 2011	n.a.	7.9%	5.1%	2.7%	5.3%	4.1%	3.7%	6.3%
1980 - 2011	n.a.	8.8%	4.6%	4.0%	6.6%	4.8%	3.8%	6.4%
July 1993 – June 2011	6.0%							

Source: Handley and ABS data, CEG analysis
*Note: The Fisher equation has been used to determine real government bond yield from nominal government bond yield and actual/expected inflation in each year. * Reflated using 2.5% inflation forecast as per my March report*

214. In addition, I note that IPART has separately estimated and relied on an estimate of the long term average risk free rate of 5.4% in two recent natural monopoly

93 Douglas, Thompson and Downes (Commonwealth Treasury), Modelling the Exchange Rate and Commodity Prices in the Treasury Macroeconomic (TRYM) Model, 1997, describe the Full Information Forward Looking Expectation for the Inflation Rate in the following way:

> *This is calculated as the average rate of inflation needed for the current price level to adjust to the 10 year ahead steady state price level.*

This is used in the TRYM model in a consistent manner along with 10 year CGS.

regulatory decision (one for SydneyWater and the other for the Sydney Desalination Plant). The logic for doing so is substantially the same as I outlined in my March report and I referred to that precedent at paragraphs 143 and 144 of that report – and included this quote: [94]

> *We determined the values for the parameters of the WACC based on market conditions over the 20 days to 28 October 2011. The risk free rate and debt margin have been affected by market volatility and the prolonged weak market following the credit crisis of 2008. The change in these factors has potentially created a disparity between these parameters (for which we use short term average data) and the market risk premium (for which we use long term average data).*
>
> *However, the effects of this disparity are mitigated by our decision to use a point estimate of 6.7%, which is 80 basis points higher than the midpoint of our estimated WACC range. In doing so, we had strong regard to the calculated WACC using longer term averages for market parameters.*

215. It is clear from IPART's statements that it relied heavily on this estimate of the long run risk free rate. I have separately also estimated the WACC that IPART would calculate if IPART set the cost of equity based on combining its 5.4% long run average risk free rate with its 6% long run average MRP but keeping all other parameters at their midpoint estimates (including the cost of debt in the averaging period). When I do this I estimate:

- a real pre tax WACC for the Sydney Desalination Plant of 6.62% which is very close to the 6.7% WACC point estimate adopted by IPART; and
- a post tax real WACC for the Sydney Water of 5.48% which is very close to the 5.6% WACC point estimate adopted by IPART.

216. That is, while IPART is not definitive as to how it arrived at its point estimate, the point estimate actually used is very similar to that which would be derived by simply substituting a 5.4% risk free rate into the CAPM formula and leaving all other parameter estimates unchanged (including the spot estimate of the cost of debt).

217. It is not clear how IPART arrived at its 5.4% estimate of the long run average risk free rate, but I note that the current 10 year average of 10 year CGS rates is 5.4% (5.36% annualised based on 10 years of data to 24 October 2012) and has been around this level at the time of IPART's decisions. This provides another possible estimate of the historical average risk free rate.

218. An approach that involved pairing a 10 year average of 10 year maturity CGS yields with a 6.0% historical average MRP would be a reasonable, if conservative,

94 IPART, Final Report - Review of water prices for Sydney Desalination Plant Pty Limited - From 1 July 2012 - December 2011, p. 80.

implementation of 'option 2' described in section 2.5. I say that this is conservative because a 10 year average of the risk free rate will be clearly depressed by a high proportion of weight given to post GFC market conditions. By contrast, the 6.0% MRP will not be similarly weighted to post GFC market conditions – where the MRP has been above 6.0%.

219. There is a remaining question about how to interpret this 5.4% historical average nominal CGS yield in real terms. One option is to assume, in my view reasonably, that investors' expected 10 year inflation over the last 10 years has been the same as it is today in which case no adjustment for differences in inflation expectations between the measurement period and the current period is required.

220. Alternatively, a more conservative estimate would be to assume that expected inflation in this period was equal to actual inflation (2.8%pa) and therefore the 5.4% nominal average would be adjusted down to 5.0% if one adopts the draft decision's 2.5% estimate of the forward looking inflation.[95]

3.7.1 Summary

221. Based on the above analysis a range for the historical average risk free rate as summarised below.

Table 3-2 Range for historical average CGS (all estimated in real terms and reflated using 2.5% expected inflation)

Period	Average indexed bond yield	Actual CGS less actual inflation	Actual CGS less expected inflation
1902 - 2011		4.7%	n.a.
1959 - 2011		5.3%	6.3%
1980 - 2011		6.6%	6.4%
10 year average to 24 October 2012		5.0%	5.4%*
July 1993 – June 2011	6.0%		

*Source: Table 3-1 above and CEG analysis set out above. *Assumes that expected 10 year inflation over the last 10 years has been in the middle of the RBA target band (ie, 2.5%).*

95 5.36% deflated by 2.82% inflation gives a real risk free rate of 2.47% using the Fisher equation. Reflating this back to nominal terms using current inflation expectations of 2.5% results in a nominal risk free rate of 5.03%

222. This suggests a range of between 4.7% and 6.6% in nominal terms given today's inflation expectations. In my view the most accurate estimates are clustered around 6.0%. These are the estimate based on actually observed real rates of return (6.0% nominal based on indexed CGS yields plus 2.5% inflation expectations) and the estimates based on deflating nominal CGS to real terms using a series of expected inflation rather than actual inflation.

223. I also note that the ten year average estimates are heavily influenced by the period since the GFC that has tended to be associated with very low risk free rates but, in my view, high risk premiums. The more heavily weighted the estimate is to data from this period the stronger the case is that this historical average risk free rate should be matched to an MRP estimate that is above 6.0%.

3.8 AER's sensitivity analysis of DGM results

224. The AER expresses considerable concern about the sensitivity of DGM modelling to its assumptions:[96]

> *DGM analysis can provide information on the expected MRP. It examines the forecast future distributions of businesses and derives the cost of equity that makes these distributions consistent with the market valuation of the equity of those businesses. However, the AER considers the DGM based estimates of the return on equity and inferred estimates of the MRP are highly sensitive to the assumptions made. If all assumptions are not sound, estimated results from DGM analysis may be inaccurate.*

225. I agree that DGM and related analysis requires a number of assumptions to be made. However, the same is true about deriving a forward looking MRP estimate from historical data. The task in implementing a DGM is, in my view, no more difficult or prone to estimation error. In this regard, I note that DGM analysis is the basis of most US regulatory decisions.

226. Many of the DGM assumptions can be observed (such as the current level of dividend yield) or can be determined by maintaining consistency with other parameters in the regulatory model (such as the level of equity beta or gamma). The most critical assumption for an unobservable parameter is the assumed growth in the future level of dividend payments.

227. The AER is correct to point out that the results of the DGM analysis are sensitive to this assumption. However, that does not mean that the results of the DGM analysis are inherently unreliable or unstable as the AER goes on to suggest when in summarising its recent views it states:[97]

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96 AER, *Access arrangement draft decision: SPI Networks (Gas) Pty Ltd 2013–17: Appendices*, p. 52

97 AER, *Access arrangement draft decision: SPI Networks (Gas) Pty Ltd 2013–17: Appendices*, p. 53

No input assumptions are reliable.

228. This statement is at odds with the use of DGM analysis by other regulators and, indeed, with the existence of financial markets at all. In my view, it is simply not a reasonable position to hold that no input assumptions are reliable. In my view, this is quite different from saying that the results of the DGM analysis are sensitive to its assumptions. The AER has no basis for this statement.

229. The AER rejects CEG's use of the AMP method to estimate the MRP by showing in Table B.4[98] that, in the period December 2011 as used in my earlier report, one could arrive at a 5.41% (1.91%) MRP by adopting an extremely low assumption regarding dividend growth of 3.5% (1.0%) – less than 1.0% (-1.5%) in real terms.

230. Unless the AER actually believes that these estimates each represent a possible alternative estimate for a reasonable long run rate of dividend growth, the results obtained using these assumptions cannot be used to support a claim that the results of the DGM model are unreliable. In my opinion, it is not possible to support a real long run growth rate as low as 1.0%[99] (and certainly not negative1.5%). None of the expert opinion on this issue, including that provided by Lally,[100] points to a long run dividend growth rate that is substantially below 6% in nominal terms.

231. In a further two 'sensitivity' analyses[101] the AER shows that if the dividend yield were now lower, or the CGS yield was now higher, than in December 2011[102] then other things constant the estimated spot MRP would be lower. In doing so the AER entertains 'sensitivity analysis' to my estimates for CGS yields as high as 6% and dividend yields as low as 1.0%.

232. This is inexplicable because the AER knew that the CGS rate in its decision was *lower* than it was in December 2011 (down from 3.77% to 2.98%). In this context, the relevant adjustment to my December 2011 analysis would not have been to raise the risk free rate assumed but to reduce it. Holding the other assumptions equal this would have raised the estimated MRP from 8.52% to 9.31%. The fact that the MRP estimate would be lowered to 6.28% if the risk free rate rose to 6.0% is

98 AER, *Access arrangement draft decision: SPI Networks (Gas) Pty Ltd 2013–17: Part 3*, p. 56

99 At less than 1% in real terms it implies long run dividend growth at a quarter of historical average GDP growth (where GDP growth is the standard assumption and is that adopted by AMP, Davis, Lally (in the past) and Damodaran (para 188 of my previous report)). Lally's most recent report comes up with a reason for assuming a growth rate of less than GDP in dividends – but even then he applies this he finds only a 1% reduction in the estimated MRP – see discussion in section 3.3..

100 See discussion of Lally in section 3.3.

101 Tables B.5 and B.6 on page 56 of AER, *Access arrangement draft decision: SPI Networks (Gas) Pty Ltd 2013–17: Part 3*.

102 When I did the analysis for my previous report.

irrelevant in circumstances where we actually know what has happened to CGS yields and they have fallen.

233. Similarly the AER knew, or should have known, that the grossed up dividend yield in July-August 2012 (from the period it estimated the risk free rate) was 5.44% (only slightly below the level in December 2011 of 5.68%). Yet the AER, in table B.5, performs 'sensitivities' around dividend yields being as low at 1.0%. The AER provides no explanation for performing 'sensitivities' that involve setting observable inputs well below the actual level observed in the relevant period.

234. The fact that the MRP estimate would be lowered to 6.28% if the risk free rate rose to 6.0% is irrelevant in circumstances where it is actually known what has happened to CGS yields and they have fallen.

235. Put simply, the AER hypothesises scenarios under which the AMP method would give lower MRP estimates than 8.5% - and relies on these hypothetical scenarios to conclude that a 6% MRP is reasonable. If instead, the AER had used actual data on the risk free rate and dividend yields then the estimate would be higher. The spot MRP would have been 9.1% using observable data inputs and assuming long run nominal (real) growth in dividends of 6.6% (4.0%). Even at an assumed growth in dividends of 5.0% nominal (2.4% real) the spot MRP would have still been 7.5%.

236. None of the consultant's reports obtained by the AER examined the reasonableness of a 6% MRP in the context of the market conditions that gave rise to a 2.98% risk free rate. Mckenzie and Partington's report is from April and Lally's is dated 25 July but includes no data whatsoever from the mid-year period of historic low CGS rates used in the SP AusNet draft decision.

237. Moreover, the AER's 'sensitivity analysis' is one-sided in looking only at 'sensitivities' that would result in a decline in the estimated MRP – with the assumptions used being entirely unrealistic. The 'sensitivities' do not include upward sensitivities and the AER has not populated the model with any defensible estimates (let alone best estimates) that establish 6% as a reasonable estimate of the prevailing spot MRP.

238. I also note the AER's concern that the MRP estimated by DGM analysis moves 'one-for-one' with the prevailing spot risk free rate.[103] I cannot understand why this should be of concern. With a proper understanding of how the MRP is defined, it is apparent that, for any given DGM estimate of the market cost of equity, the MRP must move one for one with the estimated risk free rate in that period.

239. The following quote is instructive of the errors in the AER's thinking about MRP. The AER presents the table in the below quote which it takes as evidence of the unreliability of MRP estimates derived using DGM analysis due to the variation of

[103] AER, *Access arrangement draft decision: SPI Networks (Gas) Pty Ltd 2013–17: Appendices*, p. 55

the MRP estimates over a short period. However, the variation in MRP estimates has almost nothing to do with variations in the DGM analysis – all but one[104] of which arrive at cost of equity estimates of within 1% of each other (11.70% to 12.7%). The variation in the MRP estimates are due to variations in the observed CGS yield.

BHP,[105] McKenzie and Partington,[106] and Lally[107] supported the view that DGM estimates are highly sensitive to the assumptions made. Further, different consultants produce widely different DGM based MRP estimates over a short period. Table B.1 illustrates the consultants' current estimates, which range from 6.18 per cent to 9.56 per cent.

Table B.1Recent DGM based MRP estimates produced by consultants

	Dividend yield	Dividend per share growth	RFR	MRP estimate
CEG (March 2012)	5.68%	6.60%	3.77%	8.52%
Capital Research (Feb 2012)	4.70%	7.00%	5.08%	6.62%
Capital Research (Feb 2012)	5.23%	7.00%	5.08%	7.15%
Capital Research (Feb 2012)	5.71%	7.00%	5.08%	7.63%
Capital Research (Mar 2012)	6.29%	7.00%	3.73%	9.56%
NERA (Feb 2012)	Bloomberg and IBES forecasts	5.65%	3.96%	7.72–7.75%
NERA (Feb 2012)	Bloomberg and IBES forecasts	5.65%	5.50%	6.18–6.21%
NERA (March 2012)	Bloomberg and	5.65%	3.99%	7.69–7.72%

104 The highest estimate is 13.29% by Capital Research.

105 BHP Billiton, *Submission to the AER: APA GasNet access arrangement proposal*, 29 June 2012, pp. 13–14.

106 McKenzie and Partington, *Equity market risk premium*, 21 December 2011, pp. 23–7.

107 Lally, *Cost of equity and the* MRP, July 2012, pp. 15–18.

IBES forecasts

Sources: CEG, Capital Research, Capital Research, NERA.

In the February 2012 report, Capital Research estimated an implied MRP range of 6.6 to 7.5 per cent. In estimating this range, it assumed a compound average growth rate of 7 per cent based on analysts' forecast, and a theta value of between 0 and 0.5.[108] *Capital Research's analysis demonstrated the sensitivity of the DGM analysis to its assumptions. It illustrated an increase of 0.5 in the theta assumption translates to a 0.8 to 1.2 per cent increase in the implied MRP.*[109] *Further, in the March 2012 report, Capital Research updated this estimate to 9.6 per cent (an increase of more than 2 per cent) with a more recent risk free rate and a net theta value of 0.2625.*[110]

NERA's DGM estimates also illustrated this problem. NERA estimated an MRP of 5.06 per cent in February 2011 based on the DGM analysis. Using the same dividend yield and growth assumptions, the MRP estimate was at 8.01 per cent in December 2011—a difference of 295 basis points.111 This difference was a result of the lower risk free rate. Table B.3 illustrates the sensitivity of NERA's DGM analysis to different risk free rates.

240. Within this quote is embedded the AER assumption that the MRP is constant and that the cost of equity is unstable. I, and other experts and regulators, hold the opposite view that the cost of equity is relatively stable but that the MRP is volatile largely due to variations in the risk free rate. The DGM estimates support the opposite view. The AER rejects the DGM evidence as unreliable because it shows precisely what it would show if I, and other experts, were right.

241. In doing so, the AER has employed a version of catch 22 logic. If somebody can show that the cost of equity is stable this implies that the MRP is unstable and, therefore, the method used must be unreliable. Put simply, the logic expressed above is one that starts from the proposition that the cost of equity falls in lock-step with the risk free rate and rejects as wrong any evidence that does not agree with that.

108 Capital Research, *Forward estimate of the market risk premium: Update: A response to the draft distribution determination by the AER for Aurora Energy Pty Ltd*, February 2012, pp. 19–23 (Capital Research, *MRP estimate for the Aurora determination*, February 2012).

109 Capital Research, *MRP estimate for the Aurora determination*, February 2012, Table 2, p.21.

110 Capital Research, *Forward estimate of the market risk premium: Update: A report prepared for the Victorian gas transmission and distribution businesses: APA Group, Envestra, Multinet Gas and SP AusNet*, March 2012, p. 33 (Capital Research, *MRP estimate for the Vic NSPs*, March 2012).

111 NERA, Prevailing conditions and the market risk premium*: A report for APA Group, Envestra, Multinet and SP AusNet*, March 2012, pp. 49–50 (NERA, *Prevailing conditions and the MRP*, March 2012).

3.9 Incorrect reading of causation in the CAPM formula

242. The only way that the AER's proposed methodology can give rise to a meaningful answer is if an assumption is made about how equity market returns are actually determined. Specifically, it must be assumed that on a day-to-day 'spot' basis the market return required by investors moves in lock-step with any movements in the spot risk free rate – such that a constant spot MRP is maintained. If this assumption were true then the AER's approach could be described as a spot estimate of the required return on equity in the averaging period.

243. I note that the AER explicitly admits that this is not the case in the 'short term' and has been advised that this is not the case by all of its advisers including the RBA.

244. The AER nonetheless implicitly assumes that this is the case in reaching its decision. It does so by proceeding as if the MRP can be estimated separately from its constituent components (the required return on the market and the risk free rate) and by further assuming that a long term forecast of this can be added to a spot risk free rate.

245. There is naïve reading of the CAPM formula that is consistent with assuming that the market return does move one for one with the risk free rate (either always or on average). This is associated with looking at the following *identity* and assuming that it describes a *causal* relationship flowing from (incorrectly assumed to be) independent variables on the right hand side to a dependent variable on the left hand side.

Expected market return = RFR + MRP

246. If this was the case then and if MRP was fixed or simply independent of RFR, then the expected market return would tend to move, on average, in the same direction and with the same magnitude as the RFR. The problem with this logic is that this equation is an identity that flows from the definition of the MRP – it is not a description of causation with independent variables on the right hand side.

247. It is, by contrast, the MRP that is defined in the CAPM as the difference between the other two variables.

MRP = Expected market return - RFR

248. There is no basis to proceed: a) as if the MRP can be estimated independently of the factors influencing the market return on equity and risk free rate; and then b) use the MRP so estimated to determine the market return on equity. The correct approach starts with the market return on equity and risk free rate and uses these to determine the MRP.

249. Of course, if there was an empirical regularity that the required market return on equity was always a fixed amount above the risk free rate then these two approaches

would collapse to the same thing. However, no such empirical regularity exists – at least not between the spot risk free rate and the spot market return on equity. The AER itself admits this is not a safe assumption to make in relation to spot rates of return (e.g., see the discussion of 'flight to quality' periods as described in the previous section).

250. There is, however, a basis for assuming that over the long term the required market return on equity will be reasonably stable. Populating the CAPM formula with historical average estimates for the MRP and risk free rate will result in a cost of equity estimate that is consistent with this stability.

251. In my view, the draft decision appears to be operating under the misapprehension described above. The AER comes close to making this explicit when it states:

> *The effect of using this lower risk free rate within the Sharpe-Lintner CAPM, all things being equal, is to lower the cost of equity from that determined by the AER in previous decisions.*[112]

252. In this quote the AER ascribes to the CAPM formula the conclusion that a fall in risk free rates is associated with, *all other things equal*, a fall in the cost of equity. This is not the case. Holding all other things equal means, in the context of the CAPM formula at equation (1) above, holding the expected yield on the market constant. In which case the fall in the risk free rate is offset by a fall in the MRP of the same magnitude.

253. The form of words chosen by the AER in the above quote is indicative of a wider failure to recognise that the MRP is not a variable in the CAPM in its own right independent of the other variables. The MRP in the averaging period is the expected yield on the equity market *in the averaging period* less the risk free rate *in the averaging period*.[113] The above AER quote should not even mention the Sharpe-Lintner CAPM because there is no theoretical content in the above statement. The most transparent form of words for the above quote would be:

> *The effect of ~~using this lower risk free rate within the Sharpe-Lintner CAPM, all things being equal,~~ assuming that the cost of equity falls with the risk free rate is to lower the cost of equity from that determined by the AER in previous decisions.*

112 AER, SP Ausnet draft decision, page 170.

113 Depending on whether the CAPM is being populated with spot estimates or forecasts of parameters then it is spot /forecasts estimated in the averaging period that are relevant.

3.10 Claimed lack of conclusive evidence of a negative relationship between RFR and MRP

254. The AER goes into some detail in addressing its view that there is no conclusive evidence of a negative relationship between the risk free rate and the MRP.

255. It is important to understand that in my previous report I did not rely upon the existence of a deterministic relationship between the risk free rate and the MRP. I do put forward evidence that there is, in general, a negative relationship between these variables and I have used the terminology 'negative relationship'. However, I do not claim to have shown that the risk free rate and the MRP are deterministically negatively related over all periods of time.

256. Moreover, my analysis and interpretation of data is focussed on the recent periods during the global financial crisis and the European sovereign debt crisis in which specific factors that have driven sharp falls in the yields on long term CGS are also factors that one would associate with an increase in risk premiums in general, including market risk premiums. My analysis of current estimates of the MRP and equity risk premiums, and time series comparisons of spreads for CGS yields to other instruments supports this conclusion.

257. This observation is also supported by the RBA and Treasury/AOFM letters, including specific portions quoted by the AER in its Draft Decision.

258. The fact that some studies, focusing on a different and larger time-series data find a negative relationship between risk free rates and measures of risk premiums (be they *ex post* or *ex ante*) is consistent with my views but not the basis of my views. Similarly, the fact that other studies fail to find such a relationship in time-series data does not undermine the evidence that I have put forward about current market conditions.

259. I note that the AER maintains its position that the MRP should be 6% based on the views offered by its advisors, Mackenzie and Partington, that they "would not expect the crisis conditions and extreme volatility to extend over such a long period".

260. The AER may consider that it has the discretion to set the MRP on this basis. However, if its estimate of the MRP is set on this basis then for consistency its estimate of the risk free rate should be set on the same basis. If the AER's estimate of MRP is predicated upon an out of averaging period resolution to the problems in the international economy, then so too should its estimate of CGS yields be predicated on the same out of averaging period resolution. That is, if the AER considers that the current conditions of uncertainty and perceptions of risk will dissipate in the medium term and that this justifies an MRP based upon an historic average, based upon the evidence that it relies upon elsewhere, the same conditions will cause CGS yields to rise and the same logic would justify a higher risk free rate – such as one might associate with the historic average.

Appendix A Calculations consistent with Lally's multiple discount rate model

261. I have used the equations on page 16 of Lally's report to estimate the post 10 year cost of equity on the assumption, posited by the AER (with some reserved support form Lally), that the market cost of equity over the next ten years can be estimated by adding the spot 10 year CGS rate and 6%.

262. In order to populate Lally's equations I have:

- Set the value for the market cost of equity for the next 10 years equal to 8.98%. This is the draft decision spot risk free rate (2.98%) plus a 6% MRP (ie, a cost of equity for the market of 8.98%). This means that where one sees a 1.10 discount factor in Lally's equations on page 16 one must substitute a 1.0898 discount factor.
- Set the value for "g" equal to 5.6% - which is my estimate of 6.6% less Lally's recommended adjustment of 1.0%. In Lally's equations one must replace the illustrative growth factor of 1.05 by a growth factor of 1.056; and
- Set the value of D/S equal to 5.45%. This is the RBA estimated dividend yield on the Australian market in July (4.90%) grossed up by a factor of 1.1125 for the value of imputation credits. This is now an input into the equations rather than the output that is calculated.
- Instead of setting the value of the post 10 year market cost of equity equal to 12% (as Lally does for illustrative purposes) I make this the unknown "X" that must be solved for if the above assumptions inputs hold true.

263. This gives me the following equations (based on the second line of equations on page 16 of Lally).

$$S = \frac{D(1.056)}{.0898 - 0.056}\left[1 - \left(\frac{1.056}{1.0898}\right)^{10}\right] + \frac{\left[\frac{D(1.056)^{11}}{X - 0.056}\right]}{(1.0898)^{10}}$$

264. I then need to solve this equation for "X" where X is the cost of equity beyond 10 years. In order to rearrange this expression to be in terms of X first divide both sides by D and subtract $\frac{D(1.056)}{.0898-0.056}\left[1 - \left(\frac{1.056}{1.0898}\right)^{10}\right]$ from both sides to give.

$$\frac{S}{D} - \frac{(1.056)}{.0898 - 0.056}\left[1 - \left(\frac{1.056}{1.0898}\right)^{10}\right](1.0898)^{10} = \frac{(1.056)^{11}}{X - 0.056}$$

265. Then, sequentially, invert both sides, multiple both sides by $(1.056)^{11}$ and add 0.056 to both sides to give:

$$\frac{(1.056)^{11}}{\frac{S}{D}-\frac{(1.056)}{.0898-0.056}\left[1-\left(\frac{1.056}{1.0898}\right)^{10}\right](1.0898)^{10}}+0.056=X$$

266. Note that we know the value of D/S (the grossed up dividend yield after the Lally adjustment) is 5.45%. With this information we can solve a value for 'X' which is 13.38%.

267. This tells us that, if the AER estimate of the market cost of equity is accurate for the next 10 years the cost of equity thereafter being used by investors must be 13.38% (or half as much again as the AER's 10 year estimate of 8.98%).

COMPETITION ECONOMISTS GROUP

Tom Hird is a founding Director of CEG's Australian operations. In the five years since its inception CEG has been recognised by Global Competition Review (GCR) as one of the top 20 worldwide economics consultancies with focus on competition law. Tom has a Ph.D. in Economics from Monash University. Tom is also an Honorary Fellow of the Faculty of Economics at Monash University and is named by GCR in its list of top individual competition economists.

Tom's clients include private businesses and government agencies. Tom has advised clients on matters pertaining to a range of cost of capital issues.

In terms of geographical coverage, Tom's clients have included businesses and government agencies in Australia, Japan, the UK, France, Belgium, the Netherlands, New Zealand, Macau, Singapore and the Philippines. Selected assignments are summarized below.

Recent

Expert reports for Sydney Water on how to structure a test of whether or not a business's capital program is financeable.

Expert reports to Vector on the cost of capital for monopoly gas and electricity businesses in New Zealand.

Advice to Everything Everywhere in relation to the cost of capital for UK mobile operators – including appeal of regulator's decision.

Expert evidence to the Australian Competition Tribunal on the cost of debt for Jemena Electricity Networks.

Advice to Integral Energy on optimal capital structure.

Advice to ActewAGL on estimation of the cost of debt.

Advising NSW, ACT and Tasmanian electricity transmission and distribution businesses on the cost of capital generally and how to estimate it in the light of the global financial crisis.

Advice in relation to the appeal by the above businesses of the AER determination

Expert testimony to the Federal Court of Australia on alleged errors made by the Australian Competition and Consumer Commission (ACCC) in estimating the cost of capital for Telstra.

Advice to T-Mobile (Deutsche Telekom) on the cost of capital for mobile operators operating in Western Europe.

Advising Optus and TERRiA on the cost of capital to be used in developing their tender to build the next generation fibre to the node (FTTN) broadband network in Australia.

Advising Vivendi on the correct cost of capital to use in a discounted cash flow analysis in a damages case being brought by Deutsche Telekom.

Advising the Energy Networks Association on cost of capital issues in the context of the Australian Energy Regulator (AER) five year review of the cost of capital in the NER.

2007

Advising the Victorian gas distributors in relation to their response the ESCV's draft decision on the cost of capital (four reports).

Advising the Energy Networks Association on the appropriate estimation technique for the risk free rate used in CAPM modeling (two reports).

Earlier

Advising the Australian Energy Regulator on the cost capital issues in relation to the RBP pipeline access arrangement.

Advising the ENA on the relative merits of CBASpectrum and Bloomberg's methodology for estimating the debt margin for long dated low rated corporate bonds.

Advising the Australian Competition and Consumer Commission, Australia on the correct discount rate to use when valuing future expenditure streams on gas pipelines.

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5 November 2012

Dr Tom Hird
Competition Economist Group
Suite 201
111 Harrington Street
SYDNEY NSW 2000

Dear Sir

Victorian Gas Access Arrangement Review 2013-2017: Envestra, Multinet and SP AusNet

We act for Envestra Limited (**Envestra**), Multinet Gas (DB No. 1) Pty Ltd and Multinet Gas (DB No. 2) Pty Ltd (together, **Multinet**) and SPI Networks (Gas) Pty Ltd (**SP AusNet**) in relation to the Australian Energy Regulator's (**AER**) review of the Gas Access Arrangements for Victoria.

Envestra, Multinet and SP AusNet as well as APA GasNet (Operations) Australia Pty Ltd (together the **Gas Businesses**) wish to jointly engage you to prepare an expert report in connection with the AER's review of the Victorian Access Arrangements. The report will also be used by Envestra for the AER's review of Envestra's Access Arrangement for its Albury Distribution Network.

This letter sets out the matters which the Gas Businesses wish you to address in your report and the requirements with which the report must comply.

Terms of Reference

The terms and conditions upon which each of the Gas Businesses provides access to their respective networks are subject to five yearly reviews by the AER.

The AER undertakes that review by considering the terms and conditions proposed by each of the Gas Businesses against criteria set out in the *National Gas Law* and *National Gas Rules*.

Rule 76 of the *National Gas Rules* provides that the Gas Businesses' total revenue for each regulatory year is to be determined using the building block approach, in which one of the building blocks is a return on the projected capital base for the year.

Rule 87(1) provides that the rate of return on capital is to be commensurate with prevailing conditions in the market for funds and the risks involved in providing reference services. Rule 87(2) provides that a well accepted approach incorporating the cost of equity and debt (such as the Weighted Average Cost of Capital (**WACC**)) is to be used along with a well accepted financial model (such as the Capital Asset Pricing Model (**CAPM**)) in determining the rate of return on capital.

The Gas Businesses are seeking expert assistance in respect of their proposed estimates of the cost of equity to be used in the calculation of the WACC (through the CAPM) and the approach of the AER in recent draft decisions for each of the Gas Businesses.

In this context the Gas Businesses wish to engage you to prepare an expert report which:

(a) Updates your analysis in CEG's report : *Internal consistency of risk free rate and MRP in the CAPM:* March 2012 to:

  (i) reflect the latest available market data and in light of the recent AER decisions; and

  (ii) compare the volatility of outcomes derived from estimating a risk free rate using the CGS yields over a 10-40 day averaging period, using various different examples of such averaging periods over the past couple of years, versus the outcome of estimating the risk free rate using a long term average measured over an appropriate period.

  (iii) Update your opinions on the methodologies for estimating the cost of equity.

(b) In a new report , respond to the AER's Draft Decisions for each of the Gas Businesses, including:

  (i) Whether the AER's estimate of the cost of equity using an estimate for the MRP of 6% combined with a spot risk free rate (applying short term CGS yields) in your opinion reflects prevailing conditions in the market for funds and if not, why not.

  (ii) The AER's statement that its methodology for estimating the cost of equity is to estimate a 10 year forward looking risk free rate and a 10 year forward looking MRP[1] and whether, in your opinion, the AER's methodology does achieve this.

  (iii) The AER's response to the CEG March 2012 report set out in sections B1.2, B1.3 and the DGM estimates in B2.3 and B2.4 of the Appendices to the relevant Draft Decisions.

  (iv) The AER's decision on the extent of the inverse relationship between the MRP and risk free rate (sections 4.3.2, 4.3.4 of Attachment 4 to the relevant Draft Decisions) (to the extent not covered in your update report).

  (v) Your response to the AER's reliance on the RBA letter to the ACCC of 16 July 2012 that "CGS yields are the most appropriate risk free rate in Australia in prevailing market conditions."[2]

[1]See page 58, 65, 80 of the RBP Final Decision
[2]Ibid page 66.

(vi) The AER's statements relating to addressing problems with one parameter by reference to another, and in particular, the statements of Professor Lally in respect of CEG's proposed method of using a long term average risk free rate.[3]

(vii) The report by Lally *"Risk free rate and present value"* August 2012 which argues that the use of a long term average risk free rate is inconsistent with the present value principle.

(viii) Any other relevant matters you which to comment on arising from the AER's Draft Decisions and expert reports on the cost of equity, in particular the reports of *Lally* (July 2012) and *McKenzie and Partington (April 2012 and Lally (August 2012)*.

Use of Report

It is intended that your report will be included by each of the Gas Businesses in their respective responses to the AER's Draft Decisions in respect of their access arrangement revision proposals for their Victorian networks(and in the case of Envestra, Albury network) for the access arrangement period from 1 January 2013 to 31 December 2017. The report may be provided by the AER to its own advisers. The report must be expressed so that it may be relied upon both by the Gas Businesses and by the AER.

The AER may ask queries in respect of the report and you will be required to assist each of the Gas Businesses in answering these queries. The AER may choose to interview you and if so, you will be required to participate in any such interviews.

The report will be reviewed by the Gas Businesses' legal advisers and will be used by them to provide legal advice to the Gas Businesses as to their respective rights and obligations under the *National Gas Law* and *National Gas Rules*. You will be required to work with these legal advisers and the Gas Businesses' personnel to assist them to prepare the Gas Businesses' respective responses to the Draft Decisions and submissions in response to the Final Decisions made by the AER.

If any of the Gas Businesses choose to challenge any decision made by the AER, that appeal will be made to the Australian Competition Tribunal and the report will be considered by the Tribunal. The Gas Businesses may also seek review by a court and the report would be subject to consideration by such court. You should therefore be conscious that the report may be used in the resolution of a dispute between the AER and any or all of the Gas Businesses as to the appropriate level of the respective Distributor's distribution tariffs. Due to this, the report will need to comply with the Federal Court requirements for expert reports, which are outlined below.

You must ensure you are available to assist the Gas Businesses until such time as the Access Arrangement Review and any subsequent appeal is finalised.

Timeframe

The AER's Draft Decisions in respect of the Gas Businesses' respective access arrangement revision proposals have now been released. The Gas Businesses have until 9 November 2012 to respond to the Draft Decisions (including the provision of any expert reports).

[3]See page 80 and report Lally: *Cost of equity and the MRP*, July 2012

Compliance with the Code of Conduct for Expert Witnesses

Attached is a copy of the Federal Court's Practice Note CM 7, entitled "*Expert Witnesses in Proceedings in the Federal Court of Australia*", which comprises the guidelines for expert witnesses in the Federal Court of Australia (**Expert Witness Guidelines**).

Please read and familiarise yourself with the Expert Witness Guidelines and comply with them at all times in the course of your engagement by the Gas Businesses.

In particular, your report prepared for the Gas Businesses should contain a statement at the beginning of the report to the effect that the author of the report has read, understood and complied with the Expert Witness Guidelines.

Your report must also:

1 contain particulars of the training, study or experience by which the expert has acquired specialised knowledge;

2 identify the questions that the expert has been asked to address;

3 set out separately each of the factual findings or assumptions on which the expert's opinion is based;

4 set out each of the expert's opinions separately from the factual findings or assumptions;

5 set out the reasons for each of the expert's opinions; and

6 otherwise comply with the Expert Witness Guidelines.

The expert is also required to state that each of the expert's opinions is wholly or substantially based on the expert's specialised knowledge.

It is also a requirement that the report be signed by the expert and include a declaration that "*[the expert] has made all the inquiries that [the expert] believes are desirable and appropriate and that no matters of significance that [the expert] regards as relevant have, to [the expert's] knowledge, been withheld from the report*".

Please also attach a copy of these terms of reference to the report.

Terms of Engagement

Your contract for the provision of the report will be directly with the Gas Businesses. You should forward to each of the Gas Businesses any terms you propose govern that contract as well as your fee proposal.

Please sign a counterpart of this letter and forward it to each of the Gas Businesses to confirm your acceptance of the engagement by the Gas Businesses.

Yours faithfully

Johnson Winter & Slattery

Enc: Federal Court of Australia Practice Note CM 7, "Expert Witnesses in Proceedings in the Federal Court of Australia"

……
Signed and acknowledged by Tom Hird

Date ……..

ceg COMPETITION ECONOMISTS GROUP

Update to March 2012 Report

ON CONSISTENCY OF THE RISK FREE RATE AND MRP IN THE CAPM

November 2012

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COMPETITION ECONOMISTS GROUP

Table of Contents

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List of Figures

List of Tables

1 Introduction

1. My name is Tom Hird. I have a Ph.D. in Economics and 20 years of experience as a professional Economist. My curriculum vitae is provided separately.

2. This report provides an update to my March 2012 report: *Internal consistency of risk free rate and MRP in the CAPM*. I have considered the AER decisions made since March 2012, including the Final Decision for the Roma to Brisbane Pipeline (RBP), the Draft Decisions for the Victorian Gas Distribution Businesses and the Draft Decision for APA GasNet. Based on my analysis, the AER's estimates of the cost of equity do not meet the objective on Rule 87(1).

1.1 Terms of reference

3. The Victorian gas businesses[1] have asked me to provide a response to the AER's draft decisions they have received on the cost of equity.

> *The terms and conditions upon which each of the Gas Businesses provides access to their respective networks are subject to five yearly reviews by the AER.*
>
> *The AER undertakes that review by considering the terms and conditions proposed by each of the Gas Businesses against criteria set out in the National Gas Law and National Gas Rules.*
>
> *Rule 76 of the National Gas Rules provides that the Gas Businesses' total revenue for each regulatory year is to be determined using the building block approach, in which one of the building blocks is a return on the projected capital base for the year.*
>
> *Rule 87(1) provides that the rate of return on capital is to be commensurate with prevailing conditions in the market for funds and the risks involved in providing reference services. Rule 87(2) provides that a well accepted approach incorporating the cost of equity and debt (such as the Weighted Average Cost of Capital (**WACC**)) is to be used along with a well accepted financial model (such as the Capital Asset Pricing Model (**CAPM**)) in determining the rate of return on capital.*
>
> *The Gas Businesses are seeking expert assistance in respect of their proposed estimates of the cost of equity to be used in the calculation of the WACC (through the CAPM) and the approach of the AER in recent draft decisions for each of the Gas Businesses.*

[1] Envestra, Multinet, APA and SPAusNet.

COMPETITION ECONOMISTS GROUP

In this context the Gas Businesses wish to engage you to prepare an expert report which:

(a) Updates your analysis in CEG's report : Internal consistency of risk free rate and MRP in the CAPM: March 2012 to:

(i) reflect the latest available market data and in light of the recent AER decisions; and

(ii) compare the volatility of outcomes derived from estimating a risk free rate using the CGS yields over a 10-40 day averaging period, using various different examples of such averaging periods over the past couple of years, versus the outcome of estimating the risk free rate using a long term averagemeasured over an appropriate period.

(iii) Update your opinions on the methodologies for estimating the cost of equity.

(b) In a new report , respond to the AER's Draft Decisions for each of the Gas Businesses, including:

(i) Whether the AER's estimate of the cost of equity using an estimate for the MRP of 6% combined with a spot risk free rate (applying short term CGS yields) in your opinion reflects prevailing conditions in the market for funds and if not, why not.

(ii) The AER's statement that its methodology for estimating the cost of equity is to estimate a 10 year forward looking risk free rate and a 10 year forward looking MRP[1] and whether, in your opinion, the AER's methodology does achieve this.

(iii) The AER's response to the CEG March 2012 report set out in sections B1.2, B1.3 and the DGM estimates in B2.3 and B2.4 of the Appendices to the relevant Draft Decisions.

(iv) The AER's decision on the extent of the inverse relationship between the MRP and risk free rate (sections 4.3.2, 4.3.4 of Attachment 4 to the relevant Draft Decisions) (to the extent not covered in your update report).

(v) Your response to the AER's reliance on the RBA letter to the ACCC of 16 July 2012 that "CGS yields are the most appropriate risk free rate in Australia in prevailing market conditions."2

(vi) The AER's statements relating to addressing problems with one parameter by reference to another, and in particular, the

statements of Professor Lally in respect of CEG's proposed method of using a long term average risk free rate.3

(vii) The report by Lally "Risk free rate and present value" August 2012 which argues that the use of a long term average risk free rate is inconsistent with the present value principle.

(viii) Any other relevant matters you which to comment on arising from the AER's Draft Decisions and expert reports on the cost of equity, in particular the reports of Lally (July 2012) and McKenzie and Partington (April 2012 and Lally (August 2012).

[1] See page 58, 65, 80 of the RBP Final Decision

[2] Ibid page 66.

[3] See page 80 and report Lally: *Cost of equity and the MRP*, July 2012.

4. This report addresses part (a) of the above terms of reference. The AER's draft decisions are substantively the same so, for practical reasons, I have referenced the SPAusNet draft decision although the same AER analysis can be found in all decisions.

1.2 Report structure

5. The remainder of this report is set out as follows:

- section 2 provides a summary of volatility in CGS yields over time, and the impact of this volatility on the cost of equity as estimated by the AER, including the recent Roma to Brisbane Pipeline Final Decision;
- section 3 provides an assessment of whether risk premiums in general have stayed constant as CGS yields have fallen since mid-2011. I conclude that risk premiums have risen materially over this period (measured relative to CGS yields) such that the required return on risk assets in general has not fallen one-for-one with the fall in CGS rates. I believe that this conclusion is supported by the RBA advice to the AER;
- section 4 provides an analysis of why this has been the case;
- section 5 examines regulatory practice from the US, UK and Australia that is relevant to the issues involved;
- section 6 provides my views on how the cost of equity can be estimated in the current circumstances in a manner that is consistent with Rule 87(1) of the NGR; and
- section 7 provides a summary of my conclusions.

6. I have read, understood and complied with the Federal Court Guidelines on Expert Witnesses. I have made all inquiries that I believe are desirable and appropriate to answer the questions put to me. No matters of significance that I regard as relevant have to my knowledge been withheld.

7. I have been assisted in the preparation of this report by Johanna Hansson from CEG's Sydney office. However, the opinions set out in this report are my own.

Thomas Nicholas Hird

9 November 2012

2 Movements in the risk free rate and AER methodology

8. This section provides a factual summary of volatility in CGS yields over time, and the impact of this volatility on the cost of equity as estimated by the AER. It updates analysis undertaken for the purposes of my March 2012 report, and also reflects on any implications this update has on the conclusions made in the March 2012 report.

2.1 CGS yields are at historical low

9. In my March 2012 report, I illustrated that the yields on 10 year nominal CGS have been very volatile over the last decade. I presented a time series for yields on 10 year CGS (Figure 1 on p. 4) which showed that the largest swings in the risk-free rate were associated with the onset of financial market crises. The first large swing occurred in the aftermath of the collapse of Lehman Brothers and the near collapse of other financial institutions in late 2008. The second large swing occurred in the subsequent recessions in the US and Europe, which then gave rise to a deepening sovereign debt, banking and currency crisis in the Eurozone.

10. In the context of this figure, I noted that, during both of these financial crises, there has been a dramatic fall in 10 year CGS yields in Australia and that the decline had left these yields at their lowest levels in the last decade and, indeed, over the past 50 years.

11. After the March 2012 report, yields on 10 year CGS have declined even further to below 3% in mid-2012. This is illustrated in Figure 2 below. The yields have bounced back slightly since their lowest levels in mid-2012, but are at the time of writing still below 3.5%. This is still notably below the yields in late-2011 and early-2012 examined by me in my March 2012 report – illustrating that the volatility observed at that time has not subsided but rather has been accentuated.

2.2 AER methodology will cause the cost of equity to be at a historically low level

12. As noted in my March 2012 report (paragraphs 33 – 36), the AER's methodology can reasonably be described as estimating the cost of equity by adding an invariant market risk premium multiplied by a relatively stable beta to the fluctuating, and often wildly fluctuating, spot risk free rate.

13. The mechanical explanation for this phenomenon is relatively simple to understand. It reflects the AER's methodology which applies the Capital Asset Pricing Model

(CAPM) in a manner that attempts to obtain the best estimate of the risk free rate, beta and market risk premium independently of one another.

14. The risk free rate is set equal to the prevailing risk free rate (which is very volatile), whereas the market risk premium is based primarily on the AER's estimate of the historical average premium[2] earned by Australian equity investors (which is, by construction, very stable).

15. The risk free rate and the market risk premium fit together in the CAPM as per the following equation:

$$Cost\ of\ Equity = Risk\ Free\ Rate + \beta \times Market\ Risk\ Premium$$

16. This equation makes clear that if the risk free rate fluctuates significantly and the market risk premium estimate is stable then, for any given beta estimate, the cost of equity estimate will move in line with the risk free rate.

17. At the time of my March 2012 report, the AER had recently released a Draft Decision for Aurora (released in November 2011). In the Aurora Draft Decision, the AER assumed that equity investors investing in a 60% geared electricity distribution businesses require a 9.08% nominal (6.4% real) return on equity. At the time, this was the lowest cost of equity allowance set by the AER, or the ACCC before it, for an energy transport business. In fact, prior to the global financial crisis of late 2008 the allowed cost of equity was universally above 11%, and averaged around 12%.

18. Since the March 2012 report, the AER has released a Final Decision for Aurora (30 April 2012), a Final Decision for the Roma to Brisbane Pipeline (10 August 2012), draft decisions for APA GasNet and SP AusNet (11 September 2012) and draft decisions for Multinet Gas and Envestra (Victoria and Albury) (24 September 2012).

19. In the Aurora Final Decision, the AER assumes that equity investors investing in a 60% geared electricity distribution business require an 8.69% nominal return on equity. The corresponding assumption for the Roma to Brisbane Pipeline is 7.75%, and 7.78% for all of APA GasNet, Envestra (Victoria and Albury), Multinet Gas and SP AusNet.

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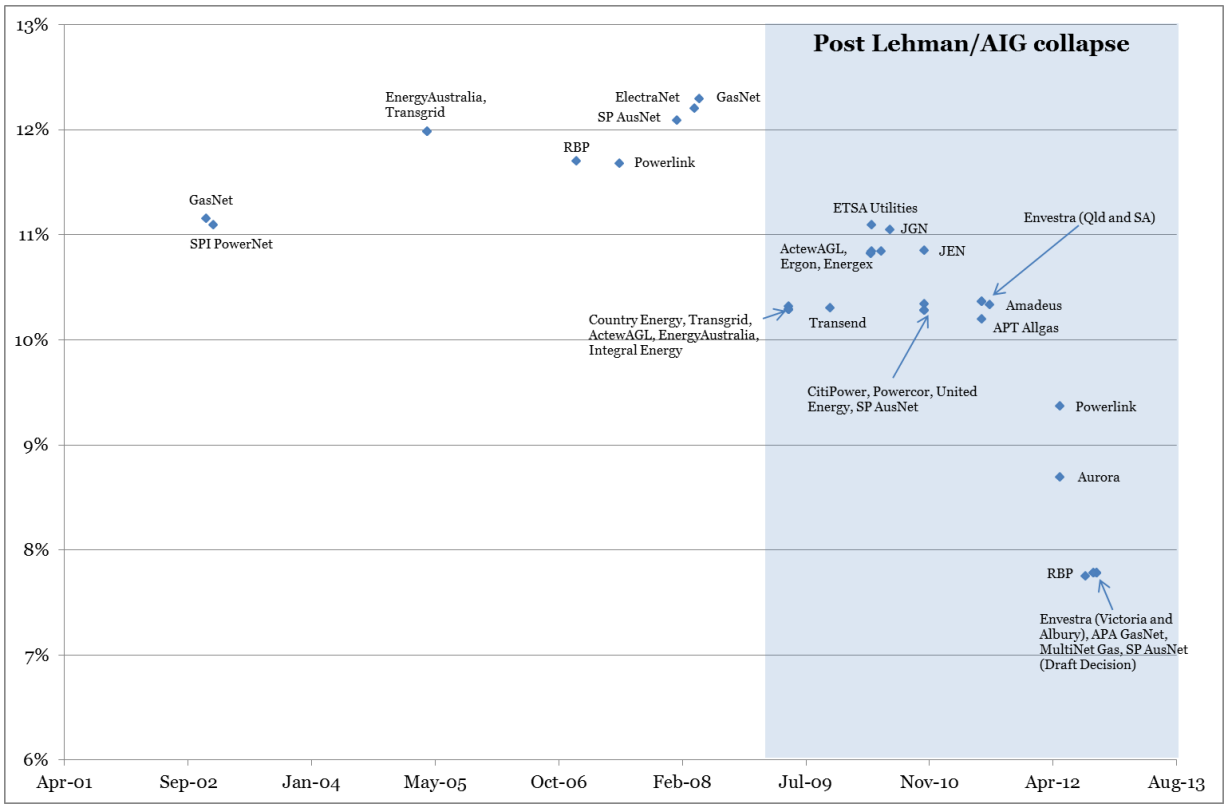
[2] See for example AER (2009) *Electricity transmission and distribution network service providers – Review of the weighted average cost of capital (WACC) parameters,* p. 177:

> *In assessing the MRP, the AER had regard to historical estimates, cash flow measures using variants of the dividend growth model (DGM), and surveys of market practioners. Consistent with past regulatory practice, rather than placing sole weight on any particular measure of the MRP, the AER had regard to each measure, tempered by an understanding of the strengths and weaknesses of each measure. This led to the* ***AER placing primary weight on historical estimates****, but also having regard to cash flow measures and surveys [emphasis added]*

20. The nominal return on equity assumed in these recent final and draft decisions are now the lowest cost of equity allowances set by the AER, or the ACCC before it, for an energy transport business.

21. Figure 1 below is an updated version of Figure 2 (p. 5) of my March 2012 report. In the March 2012 version of this figure, the Aurora marker sat at about 9%, notably lower than any decision before it. In this version, the cost of equity allowed in the AER's final decisions for Aurora and RBP both sit below 9% - RBP even sits below 8%. Also the draft decisions for APA GasNet, Envestra, Multinet Gas and SP AusNet sit below 8%.

Figure 1: Cost of equity decisions for regulated energy businesses



Source: Regulator's decisions, CEG analysis. Note that 2009 decision for EnergyAustralia et al is before amendment by the ACT

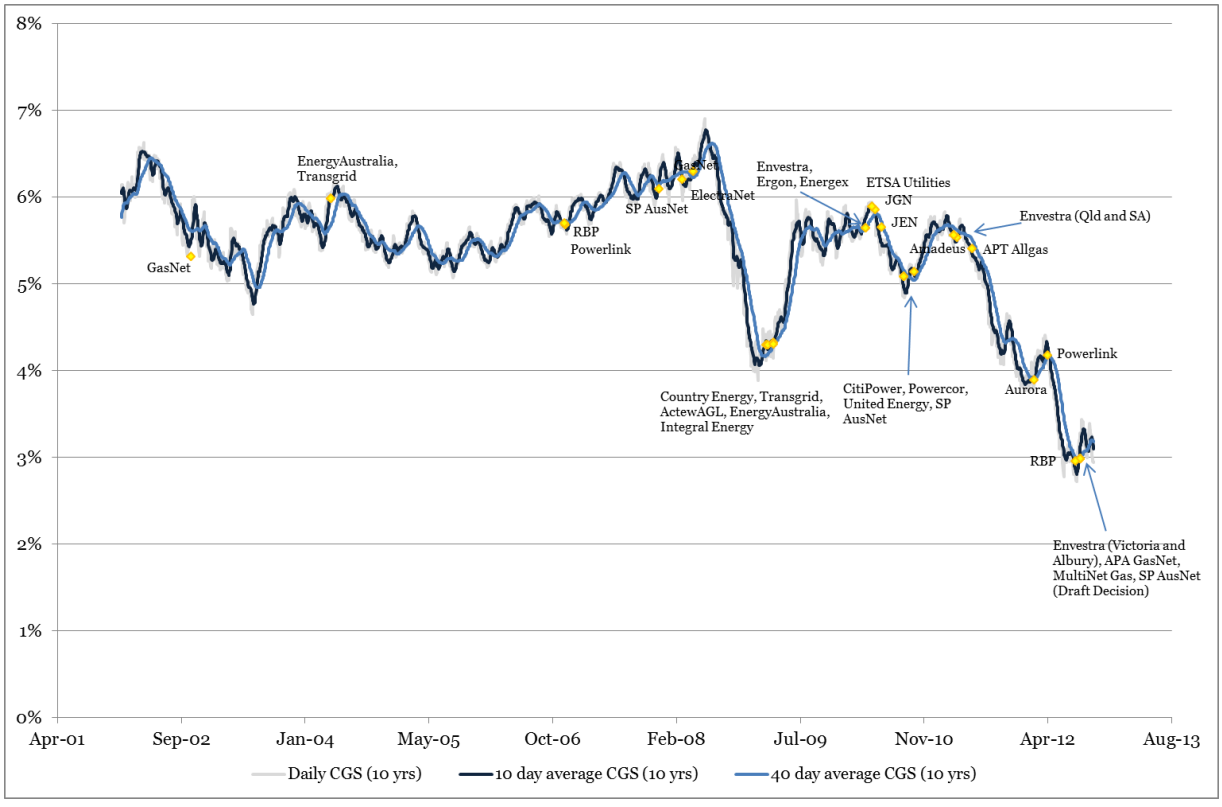
22. The updated version of the figure above reinforces and accentuates the conclusion from my March 2012 report that the AER's methodology causes the cost of equity to fluctuate in the same degree as the CGS, the effect of which is that the AER estimates are currently at historically low levels.

2.3 AER methodology creates commercial uncertainty

23. The recent Aurora and RBP final decisions, as well as the recent draft decisions for the Victorian Gas Businesses, are the most striking examples of an important side effect of the AER methodology. Under this methodology, the return on equity, and the associated investment incentives for a business, depends critically on the precise date of their proposed short term "averaging period". An averaging period that is just a few weeks later or earlier can result in an allowance for the cost of equity that is more than 100 basis points different – and this difference is locked in for 5 years even if the CGS yield does not stay at the level observed in that averaging period.

24. Figure 2 below illustrates the movement in the risk free rate over time - and its impact on the allowed cost of equity in various regulatory decisions. This figure shows that the risk free rate, and therefore the compensation for making equity investment allowed by the AER is highly unstable.

Figure 2: Risk free rate decisions for regulated energy businesses



Source: Regulator's decisions, CEG analysis. Note that 2009 decision for EnergyAustralia et al is before amendment by the ACT

25. The effect of this is that the regulatory regime creates a 'roulette-wheel' for equity investors – with the timing of their averaging period equivalent to the fall of the ball on the roulette-wheel.

26. By way of example, consider the impact of falling CGS rates on the allowed cost of equity for APT Allgas, Aurora and Powerlink, and RBP. Aurora received 151 basis points (per annum for five years) less compensation than Powerlink simply because Aurora's averaging period started seven months after APT Allgas' averaging period ended. Powerlink received 28 basis points more than Aurora because its averaging period started one month after Powerlink's finished. RBP received 122 basis points less than Powerlink (and 245 basis points less than APT Allgas) simply because its averaging period started four months after Powerlink's ended (14 months after APT Allgas's averaging period ended).

27. These are very significant differences as a proportion of the real cost of equity allowed. By way of illustration, RBP's real (inflation adjusted) allowance for the cost of equity was just 5.07% per annum.[3] The 245 basis points difference between the RBP risk free rate and the APT Allgas risk free rate accounts for very nearly half of the actual real return allowed RBP. Put another way, APT Allgas's real allowance for the cost of equity (7.46%) was 47% higher than RBP's solely due to the higher CGS yields in APT Allgas's averaging period.

28. This fall in AER allowed compensation for investment by equity financiers occurred despite economic indicators suggesting that attracting such investment was becoming more - not less - difficult. I described these indicators in my March 2012 report and I update them in the following sections. Of course, the Aurora and RBP final decisions were not released at that time, nor were the Victorian gas distribution draft decisions.

29. In my view, this volatility in allowed returns creates commercial uncertainty for businesses. For the reasons expressed in each of my reports during these proceedings, I do not believe that businesses' actual cost of equity moves in line with movements in the risk free rate. Consequently, there is no 'natural hedge' to the businesses for the volatility in the compensation provided to them. As a result this volatility creates commercial uncertainty for businesses. Even if a business is earning an adequate return on new investments in its current regulatory period it cannot be sure whether this will be the case in the next regulatory period or whether, like RBP, its averaging period will fall in a period of market turmoil and extremely low CGS yields.

30. This uncertainty is despite the fact that the AER methodology provides certainty and stability in the market risk premium that will be used. Indeed, it is the stability in the AER's estimate of the market risk premium that creates the instability in the allowed cost of equity as a result of volatility in risk free rates. As discussed in section 5 below there is strong regulatory precedent for focussing more on stability in the cost of equity than the market risk premium.

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3 This is calculated as the nominal cost of equity of 7.75% deflated by the RBP decision estimated inflation rate of 2.55% using the Fisher equation.

31. Consistent with the views expressed in my March report, if one is to adopt an invariant estimate of the risk premium required by equity investors then it is my opinion that a long term average estimate of the risk free rate should be combined with this. The end result would be a more stable level of compensation for equity investors and the amelioration of the current roulette-wheel approach to compensating equity investors.

3 Movement in the risk free rate and the required return on other assets

32. In my March 2012 report I provided a factual assessment of whether risk premiums in general had stayed constant as CGS had fallen. The purpose of this assessment was to show that if CGS yields were falling primarily as a consequence of factors that do not push down the overall cost of equity, then the AER's approach downwardly biases the cost of equity estimate. If that can be shown to be the case then a better approach would be one where some or all of the fall in CGS yields was offset by a higher allowance for the market risk premium.

33. In my March 2012 report I showed that required returns on risky assets in general have remained relatively stable as CGS yields have fallen. To reach this conclusion I assessed evidence of recent risk premiums for:

    - low risk assets including Australian state government debt estimated by Bloomberg;
    - high risk bonds, using Bloomberg data to examine the change in spreads between BBB and AAA rated bonds with one year to maturity;
    - high risk bonds using Bloomberg data to examine the change in spread to CGS for AA, A and BBB rated corporate bonds with maturity between 1 and 5 years;
    - the equity market, using information about dividend yields to approximate the forward-looking MRP (i.e. the spread between expected equity market returns and CGS returns); and
    - utilities stocks, using the dividend growth model to estimate forward-looking equity risk premiums on the six predominantly regulated listed Australian utilities.

34. The evidence in March 2012 from all these sources pointed at higher risk premiums at times of lower CGS yields, such as those experienced in early 2009 and at the current time. This is supported by the RBA. Below I update the March 2012 analysis, and discuss any implications for the conclusions made in March 2012.

3.1 Risk premiums on low risk assets

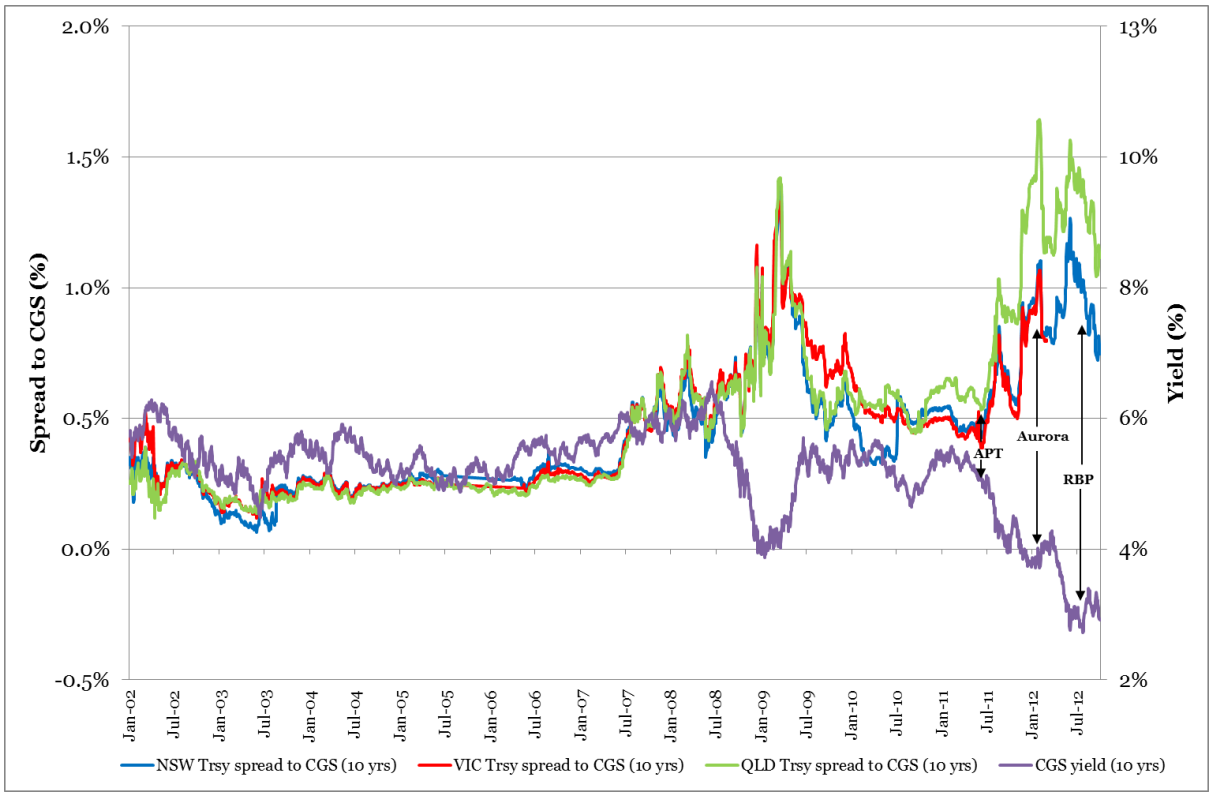
35. In my March 2012 report, I assessed the spreads between CGS yields and the yields on other very low risk assets (Figure 3 on page 11). The figure showed that the required rate of return on state government debt (rated AAA for NSW and Victoria and AA+ for Queensland) had increased materially relative to the required return on CGS since mid-2011. As a result, the difference in these returns (the "spread") had

increased materially. Moreover, this spread had returned to levels not seen since the midst of the 2008/09 financial crisis.

36. Figure 3 below is an updated version of Figure 3 from my March 2012 report. It shows that the required return on state government debt continued to increase relative to the required return on CGS since early 2012, but dropped off slightly in mid-2012. However, the difference in these returns is still very high compared to both before and after the 2008/09 financial crisis. Figure 3 also marks recent regulatory decision averaging periods.

37. I noted in March 2012 that this figure provides compelling evidence to the effect that required returns on low risk assets have not fallen in line with required returns on CGS. This conclusion is consistent with the updated analysis undertaken in this section.

Figure 3: Update of Figure 10 (Risk premiums on State Government debt relative to CGS)



Source: Bloomberg, RBA, CEG analysis

38. It can be seen that the risk premiums on AAA rated NSW and Victorian debt (left axis) more than doubled[4] between the APT Allgas and Aurora averaging periods.[5]

4 From 45.9 basis points on 31 May 2011 to 109.6 basis points on 2 February 2012.

This occurred at the same time that CGS rates fell by over 151 basis points (right axis). For the reasons spelt out in my March 2012 report, and consistent with the advice in letters to the AER from the RBA and the Treasury/AOFM,[6] these events were not independent. The same factors driving up risk premiums between these averaging periods were also manifesting in a flight to safety forcing down CGS yields.

39. Notably, between the APT Allgas and RBP decisions the risk premium on the very safe and liquid NSW Government debt also more than doubled.[7] In this context of increasing risk premiums on even the safest non-CGS assets, there is, in my view, no plausible basis for concluding that risk premiums on riskier equity assets remained constant. Put in terms of the cost of equity, it is not reasonable to assume that:

    - equity investors in RBP's operations in Queensland over its regulatory period (which happens to substantially overlap with APT Allgas's regulatory period) required a 245 basis point lower (the full extent of the fall in 10 year CGS yields) level of compensation than equity investors funding APT Allgas's operations in Queensland over the regulatory period; while
    - debt investors in very safe NSW State Government debt demanded a much smaller reduction in required return (with spreads between 10 year NSW Government debt and 10 year CGS rising by 62 basis points).[8]

3.2 Risk premiums on high risk bonds

40. In my March 2012 report I noted that it is common practice to use spreads between low risk assets and BBB rated bonds as a proxy for the level of investor aversion. In Figure 5 on page 13 I produced a figure which demonstrated a history for the spread between Standard & Poor's AAA and BBB rates bonds with one year to maturity. It showed that the spread between BBB and AAA rated bonds with one year maturity prior to 2008 was almost always less than 0.5% and averaged 0.42%. I noted that since 2008, the average spread has been over three times higher at 1.6%.

41. Figure 4 shows an updated version of Figure 5 from the March 2012 report. The average spread since 2008 (up to end of September 2012) is still 1.6%.

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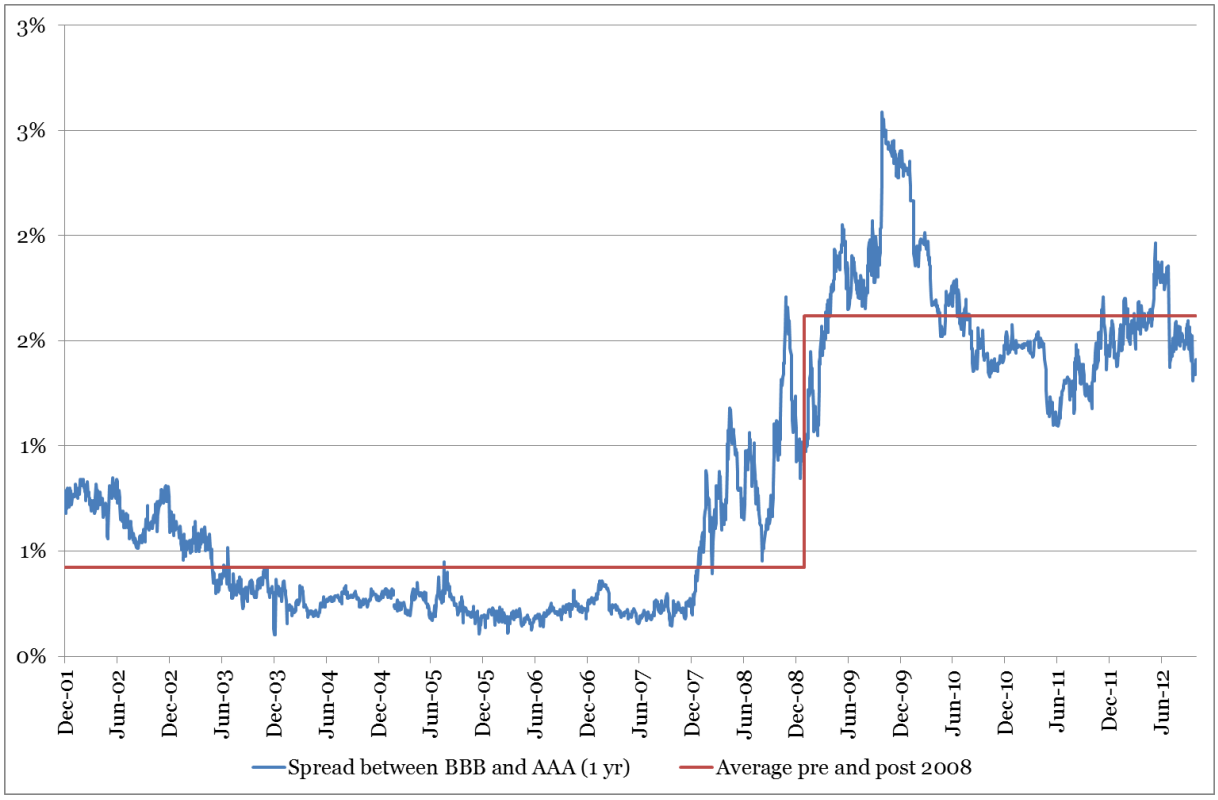
5 As explained in March report, a doubling in risk premiums on AAA rated liquid state government debt is suggestive of a very large increase in risk premium on less liquid and more risky equity (much more in absolute terms than the absolute increase in risk premiums on AAA debt).

6 See section 3.2 of my companion report *Response to AER Vic gas draft decisions, November 2012*

7 From 45.9 basis points on 31 May 2011 to 107.5 basis points on 25 June 2012.

8 The fall in CGS yields less rise in spreads to CGS for NSW Government debt from the end of the APT Allgas averaging period to the beginning of the RBP averaging period.

Figure 4: Spreads between AAA and BBB benchmark bonds at 1 year to maturity



Source: Bloomberg, CEG analysis

42. In my March 2012 report I also presented a table which showed the AAA to BBB spreads at 1 year to maturity (Table 1 page 14). The conclusion that the spread was about 3 times higher at the present time than the pre-2008 levels still holds – the average spread in November 2011 was 1.53% and the average spread in September 2012 was 1.46%. An updated version of the table is presented below.

Table 1: AAA to BBB spreads at 1 year to maturity

Sampling period	Spread (%)
Average pre-2009	0.42%
Average post-2008	1.62%
Ratio pre-2009 : post-2008	**3.8**
Average September 2012	1.46%
Ratio August 2012: pre-2009	**3.5**

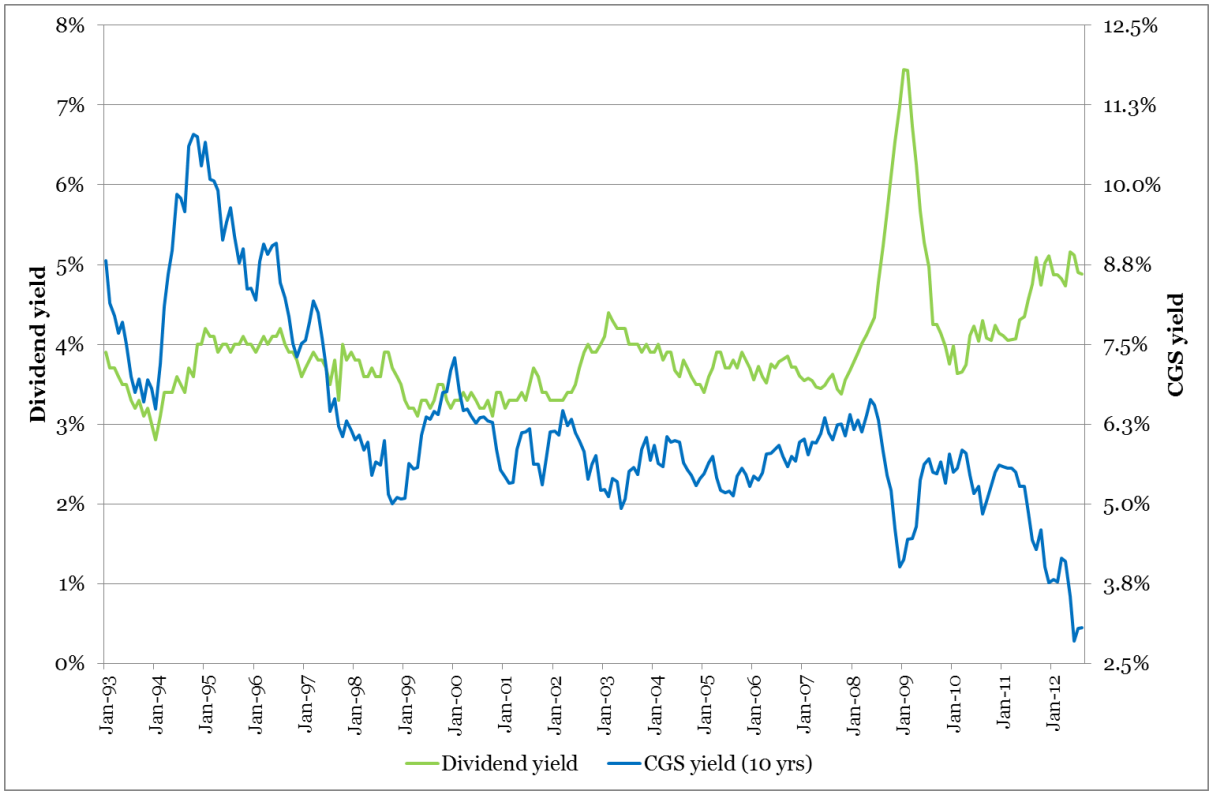
Source: Bloomberg, CEG analysis

3.3 Risk premiums on equities

43. I noted in my March 2012 report that it is common practice to use equity dividend yields as a proxy for prevailing levels of risk aversion. I presented a figure (Figure 7 on page 16) which showed the dividend yield on the ASX and the contemporaneous yield on 10 year CGS since 1993. I chose 1993 as the starting point as this coincides with the formal adoption of inflation targeting by the RBA (at the range 2-3%). The figure showed that since the 1990s, there has been a clear negative relationship between dividend yields and CGS yields– most noticeable in the 2008/09 financial crisis and more recently since mid-2011.

44. Figure 5 below is an updated version on this figure. The updated version supports my conclusion from March 2012 and even reinforces it, given that the spread is even more pronounced in mid-2012.

Figure 5: Dividend yield on ASX versus 10 year CGS yields



Source: RBA, CEG analysis
Note: Figures used in this chart are month-end figures published by the RBA in the RBA Monthly Bulletins (1993-2012) and correspond to the dividend yield information

45. In my March 2012 report I also noted that the dividend yield on listed equities can be used to arrive at a direct estimate of the prevailing cost of equity by way of a dividend growth model (DGM). In my previous report I relied on a method used by AMP

Capital Investors to estimate the prevailing cost of equity, which has also previously been relied upon by the AER in support of its position that the then MRP of 6.0% was generous.

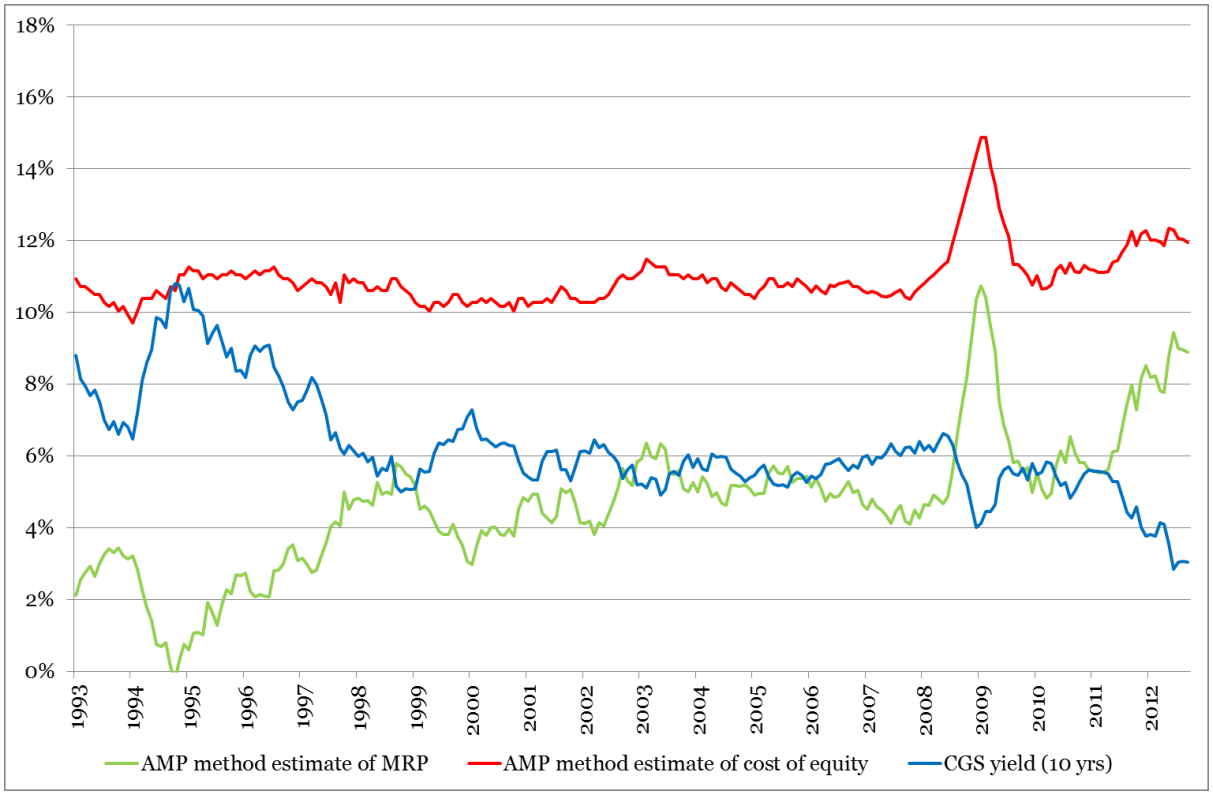
46. The AMP methodology involves approximating a cost of equity by adding the long term average nominal growth in GDP (as a proxy for long term average nominal growth in dividends) to the prevailing dividend yield for the market as a whole. This gives a 'cash' cost of equity. To convert this into a cost of equity including the value of imputation credits the cost of equity needs to scaled up by the relevant factor.

47. In Figure 8 on page 18 in my March 2012 report, I used 6.6% per annum as the long run growth path for nominal GDP (based on average real growth in GDP from 1959 until 2011 plus inflation of 2.5%) and a scaling factor of 1.1125 to capture the value of imputation credits[9]. The figure illustrated the resulting estimate of the prevailing cost of equity, together with the 10 year CGS and MRP (measured relative to the 10 year CGS yields). It was clear from the figure that the most recent fall in CGS yields has been associated with a more than offsetting rise in MRP, reflected in the rising cost of equity since mid-2011. Notably, the market cost of equity, being the sum of the CGS and the MRP, was much more stable over time than either of its components.

48. An updated version of this figure is presented below, using the same assumptions. The conclusion from my March 2012 report that the recent falls in CGS have been associated with a more than offsetting rise in MRP - resulting in a rising cost of equity - still holds until the present time.

9 This is based on the assumption of a corporate tax rate of 30%, that the value of imputation credits distributed (theta) is 35% of their face value, consistent with Australian Competition Tribunal precedent, and the proportion of dividends that are franked is 75% (consistent with Brailsford, T., J. Handley and K. Maheswaran, Re-examination of the historical equity risk premium in Australia, Accounting and Finance 48, 2008, page 85). The value of 1.1125 is calculated as 1+.30*.35*.75/(1-.3)

Figure 6: AMP method estimate of return of equity and MRP relative to 10 year CGS rates



Source: RBA, CEG analysis

49. I note that the estimated MRP in October 1994 using this methodology fell to negative 0.2%. The reason the estimated MRP becomes negative on this date is due to the simplifying assumption that I have used in assuming that inflation expectations were in the middle of the RBA target band (2.5%) at all times in history. The implication of this assumption is that investors' expected nominal growth in dividends is always equal to the historical average real GDP growth rate (4.0%) plus 2.5% inflation.

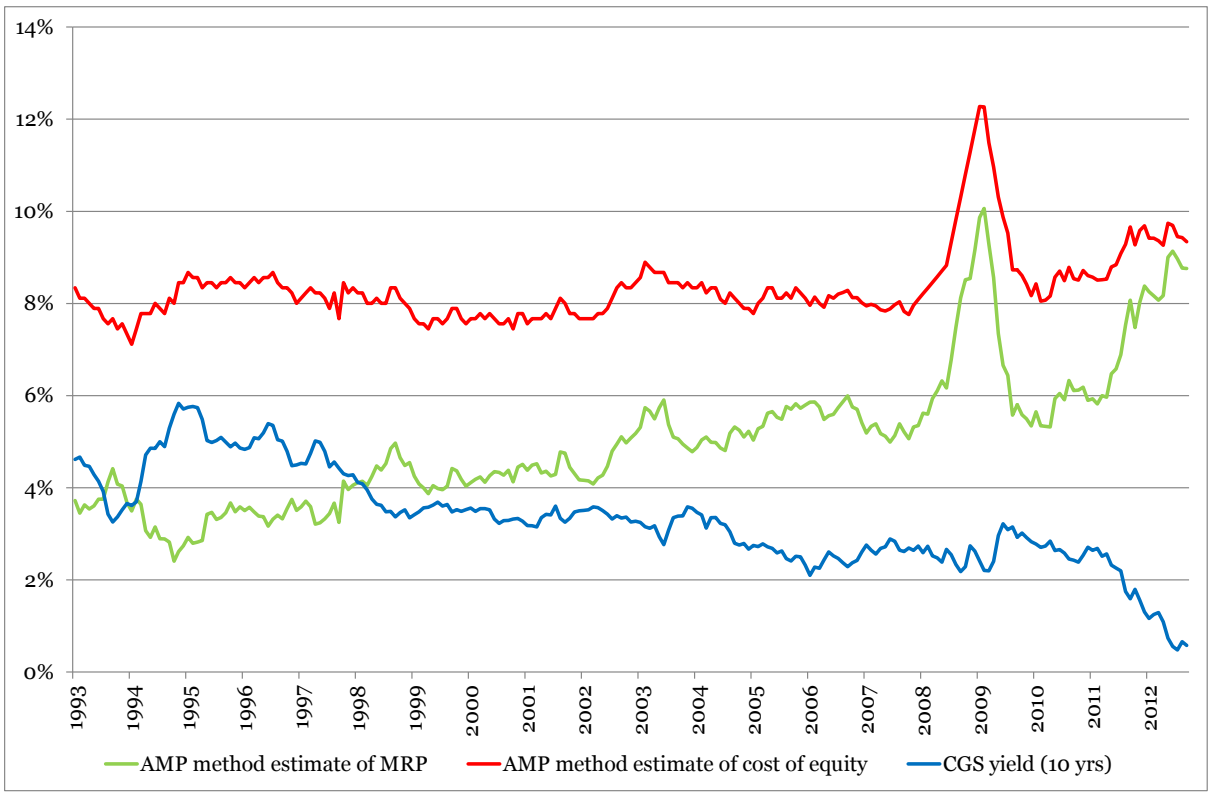
50. If, as was almost certainly the case in October 2009,[10] inflation expectations were above 2.5% then my assumption of constant 2.5% inflation expectations in history will underestimate the expected nominal return on equity. However, the contemporaneous nominal return on CGS will not be underestimated because this has been directly observed inclusive of actual inflation expectations at that time. The result is that the MRP is underestimated.

[10] Break-even 10 year inflation rates (the difference between 10 year nominal and CPI indexed CGS) in October 1994 averaged 4.5%. This means that assuming 2.5% inflation understates the true expected growth in nominal dividends and therefore the cost of equity. Breakeven inflation rates fell dramatically from this point and were below 3% from mid-1996 onwards except for a brief period in 1999/00 and again in early 2008.

51. Of course, this is not symptomatic of any problem with application of the AMP DGM model in current market circumstances were the best estimate of current inflation expectations has been used – as is the case with my estimates of the prevailing DGM in September 2012 in this report (and December 2011 in my March 2012 report).

52. Nonetheless, I can address this issue in history by performing the DGM analysis in real terms. Specifically, by using indexed CGS yields instead of nominal CGS yields as my proxy for the risk free rate and by applying a dividend growth assumption based on my estimate of real historical average GDP growth (4.0%) without grossing this up by an estimate of historical inflation expectations. When I do this I derive the following chart.

Figure 7: AMP method estimate of the real return of equity and MRP relative to 10 year real (indexed) CGS rates



Source: RBA, CEG analysis

53. This figure tells basically the same story in real terms – but with less dramatic variations in the risk free rate than when the risk free rate is expressed in nominal terms. The real market cost of equity is relatively stable through time. In the 1990's the average real risk free rate is high and the average MRP is low (and is lowest when the real risk free rate is highest). As the real risk free rate falls in the 2000's the MRP rises (and varies inversely with short as well as long term movements in the real risk free rate).

54. Notably, the inflation indexed CGS yield during the GFC does not exhibit the same volatility as the nominal CGS yield –reflecting the fact that indexed CGS are less liquid than nominal CGS and therefore less valued in a crisis period. This demonstrates that the difference between the real and nominal charts is not just related to inflation expectations. It will also reflect differential variations in the liquidity premium applied to nominal and indexed CGS. [11]

55. Most relevantly for current market circumstances, the dramatic fall in CGS yields post 2010 (and more dramatic rise in MRP) is still evident when the analysis is performed in real terms. In fact, it is in a sense clearer because we can see that real CGS yields have fallen to almost zero – making almost the entire return on the market explained by a premium relative to the near zero real CGS yields.

3.4 Risk premiums on utility equities

56. In my March 2012 report, I undertook a DGM analysis based on dividend and share price data from Bloomberg for six Australian utilities businesses: APA Group, DUET Group, Envestra, Hastings Diversified Utilities Fund, SP Ausnet and Spark Infrastructure.

57. The DGM analysis was based on analyst dividend forecasts sourced from Bloomberg on 24 February 2012 and 9 March 2012 and the average price of equities for these firms over the period 9 February 2012 to 9 March 2012. Over that same time the average 10 year CGS yields was 4.13%.

58. For the purposes of this report, I have updated the DGM analysis. The analysis is based on analyst dividend forecasts from 11 September 2012 and the average price of equities is an average over the period 13 August to 11 September 2012. Over the same period the average 10 year CGS yield was 3.2%.

59. Beyond the time at which Bloomberg dividend forecasts are available, it is necessary to make an assumption about the future path of dividend growth/decline. I show here a range of possible assumptions, including that which would be necessary to support the AER's estimated 4.8% equity risk premium (6%×0.8). The assumptions range from 0% real growth (2.5% nominal growth) to 6.6% nominal growth (long run nominal GDP growth rate).

60. I have included as a sensitivity analysis the long term growth assumption that delivers an average cost of equity equal to 8.0%. This is the cost of equity derived by combining the average CGS yield over the estimation period (3.2%) with the AER's historical average equity risk premium of 4.8%. The results show that, in order to arrive at an average equity risk premium of 4.8%, the assumed growth rate for

[11] And possibly also differences in the risk premium attached to being exposed to inflation movements for nominal bond holders.

dividends in the future has to be negative at -0.12% in nominal terms. Consequently, in order for a 4.8% equity risk premium to be supported, the assumed long run growth in dividends for these businesses must be materially negative in real terms (assuming long term inflation of 2.5% pa, i.e., in the middle of the RBA's target range).

61. The results of the DGM analysis at varying growth rates are summarised in Table 2 below.

Table 2: DGM cost of equity analysis

Dividend growth rate	-0.12%	2.50%	4.50%	6.60%
APA Group	8.0%	10.3%	12.2%	14.1%
DUET Group	8.6%	10.9%	12.8%	14.7%
Envestra	7.8%	10.2%	12.0%	13.9%
HDF	6.0%	8.5%	10.3%	12.3%
SP Ausnet	8.6%	11.0%	12.8%	14.7%
Spark Infrastructure	7.8%	10.2%	12.0%	14.0%
Weighted average cost of equity	8.0%	10.4%	12.2%	14.1%

Source: Bloomberg, CEG analysis

62. The corresponding results from the March 2012 report DGM analysis were 10.86% assuming a growth rate of 2.50% and 14.59% using a growth rate of 6.60%. The growth rate resulting in a cost of equity of 8.9% (4.8%+4.1%) at that time was 0.30% (as opposed to -0.12% in Table 2).

63. Whilst the DGM estimates of the cost of equity have declined, they have only declined marginally and certainly have not fallen in the same manner that CGS rates have.

4 Why required returns on riskier assets are not falling in line with CGS yields

64. In this section I attempt to explain the empirical evidence presented in the previous section. That is, I attempt to explain why the required returns on riskier assets are not falling in line with CGS yields.

65. In my March 2012 report, I canvassed the views of experts such as the RBA. As described in that report, a common interpretation for the increase in spreads between CGS and other higher risk/less liquid assets (including by the RBA) is that there has been a flight to the safety and liquidity of AAA rated Government debt. This, in turn, has pushed down the yield on this asset but not all other assets.

66. I noted that a powerful demonstration of this was provided by examining the movement in risk premiums on state Government debt and the movements in CGS yields in the same chart (Figure 10 on page 24).

67. I chose the scales on the two axes deliberately to place the CGS time series approximately coincident with the state government debt time series in 2002.[12] This was done in order to allow the reader to see more easily the negative relationship between CGS yields and risk premiums in the financial crisis of 2008/09 and then again since mid-2011.

68. The figure clearly showed that the dramatic fall in 10 year CGS yields in late 2008 and early 2009 was associated with an equally dramatic increase in risk premiums (which more than doubled relative to their 2007 levels and quadrupled relative to their pre-2008 levels). As CGS yields recovered in 2009, risk premiums fell. This same pattern was observed in 2011 and early 2012.

69. Figure 3 above is an update of that figure. The same pattern that was discerned in my March 2012 report is observable in this updated version of the figure – there is a strong negative relationship between CGS yields and risk premiums that persists into 2012.

70. I noted in March 2012 that the same conclusion can be drawn by reference to the negative relationship between equity risk premiums for Australian publicly listed equities (estimated using the AMP method) and the yield on CGS (Figure 11 on page 26).

[12] The reader should note that this does not mean that the CGS yields were the same as the risk premium at that time – as CGS yields are shown on the right hand axis which starts at a higher level than the left had axis.

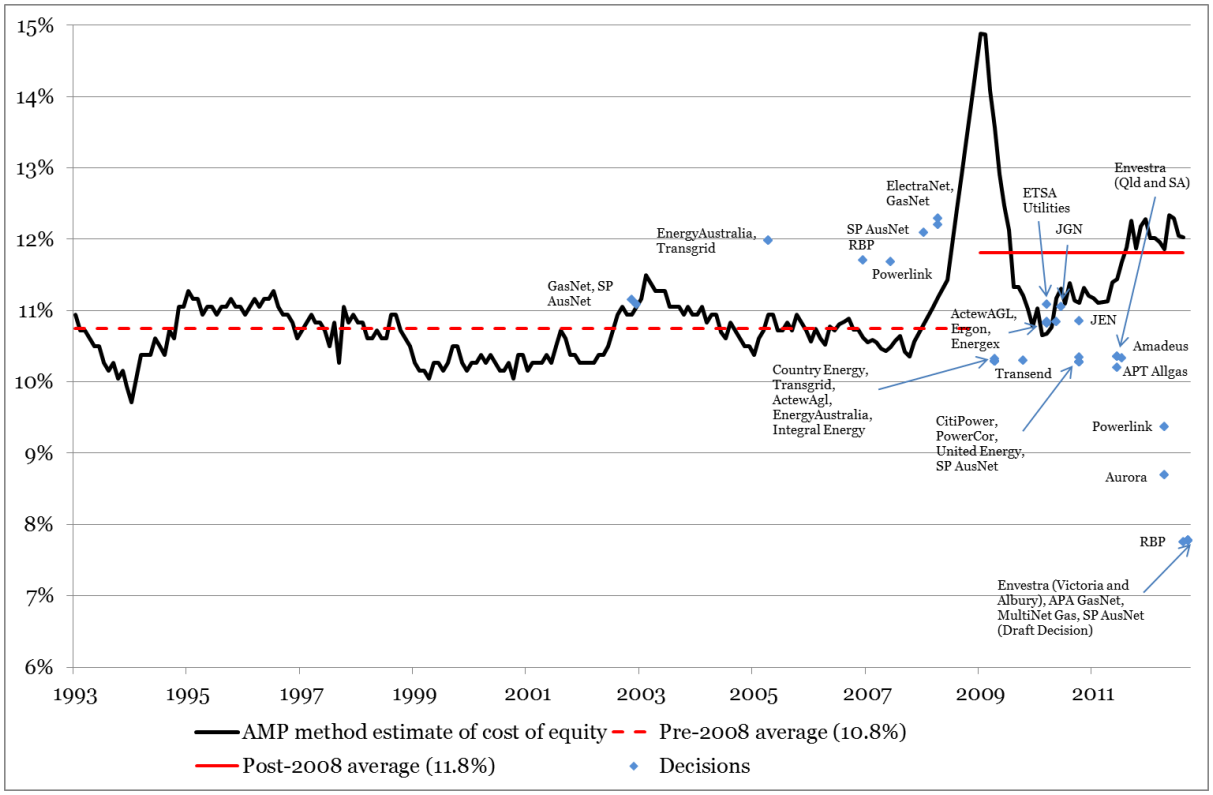
71. Figure 6 above is an updated version of this figure. This figure, like the one in my March 2012 report, shows that the risk premium is lowest when CGS yields are highest and vice versa. This can be discerned both at extreme and less extreme levels of CGS yield. The negative relationship persists into 2012.

72. I noted in my March 2012 report that, given this negative relationship between the risk free rate and the risk premium on listed equities, it is unsurprising that their sum – the required return on equity – is much more stable than its components. I illustrated this in Figure 12 on page 27, which showed that the total cost of equity has been remarkably stable between 10-11% since 1993. The exceptions to this were early 2009 and, to a lesser extent, in late 2011 when CGS yields were driven to unprecedentedly low levels by historical standards.

73. The figure also showed that, using the AMP method, the average cost of equity for the market post-2008 was somewhat higher than the average pre-2008. This was despite the average CGS yields being materially lower post-2008 (this is illustrated in Figure 6, Figure 7 and Figure 8 of this report).

74. Figure 8 below updates Figure 12 from my March 2012 report. It shows that the high cost of equity from late 2011 has persisted to the present time. Superimposed on Figure 8 are the regulatory decisions from Figure 1 in this report, illustrating that decisions up until recently were hovering around the AMP method estimate of the cost of equity for the market (black line). However, in the most recent decisions, particularly the RBP Final Decision and the Victorian gas businesses draft decisions, the AER has allowed cost of equity values far below the AMP estimate of the cost of equity for the market.

Figure 8: Total cost of equity (AMP method)



Source: RBA, regulatory decisions, CEG analysis

5 Regulatory precedent for dealing with volatility in risk free rates

75. This section outlines how the majority of regulatory precedent outside Australia is for the cost of equity to be set in a manner that ensures that unusually low risk free rates are not fully passed on in a low allowed cost of equity. There is also material precedent for this in Australia from bodies other than the AER.

5.1 Australian Competition Tribunal

76. In my March 2012 report, I commented on the Australian Competition Tribunal decision in 2009 where it was found that use of the prevailing spot risk free rate in the AER's CAPM formula (with a fixed MRP) resulted in too low a cost of equity. As noted above, this was a time of very low CGS yields as a consequence of the global financial crisis.

77. In particular I observed that, in its Final Decision for the NSW electricity distribution businesses and the NSW and Tasmanian electricity transmission operations, the AER estimated a cost of equity using an MRP of 6% and a nominal (real) risk free rate of 4.3% (1.8%). This was the lowest yield on nominal CGS since the 1950s. This decision was appealed to the Tribunal, with the contentious issue amounting to whether the historically low risk free rates during the crisis should be passed through in equally low cost of equity allowances.

78. In my March 2012 report, I compared the risk free rate allowed by the AER in its Aurora Draft Decision with the AER's risk free rate subject to merits review by the Australian Competition Tribunal. In this context I noted that the AER had set the same MRP but a materially lower risk free rate than the AER set in the EnergyAustralia decision (which the Tribunal overturned) (1.8% vs. 1.6%).

79. Of course, since the March 2012 report, the AER has made its final decision regarding RBP. In this decision, the AER set a real risk free rate of 0.4% (the real risk free rate in the most recent draft decisions for the Victorian distribution businesses is 0.5%). I focus on the real risk free rate because it is the real risk free rate and not the nominal risk free rate that determines the nominal level of revenues that the PTRM cost model actually delivers to regulated businesses.

80. As was the case with the Aurora Draft Decision, the AER's RBP Final Decision fails to raise the MRP to even partially offset the impact on the cost of equity of lower risk free rates resulting from a flight from risky assets. (In fact, the AER decided to use its discretion to *reduce* the Aurora MRP (a reduction which was subsequently maintained for RBP) from 6.5% as set out in the SORI to 6.0% - thereby compounding the impact of the falling CGS rates on the allowed cost of equity.)

81. The table below compares the CAPM parameters used in the RBP Final Decision to the parameters rejected by the Tribunal as being in error in EnergyAustralia.

Table 3: Cost of equity estimates

Parameter	Tribunal correction to AER error	AER decision (pre-Tribunal correction)	AER decision for RBP
Real risk free rate	3.3%	1.8%	0.4%
Beta	1.0	1.0	0.8
MRP	6.0%	6.0%	6.0%
Real cost of equity	9.3%	7.8%	5.2%

Source: Regulatory decisions

82. The table above demonstrates that the AER has set the same MRP but a materially lower risk free rate than the AER set in the EnergyAustralia decision (which the Tribunal overturned). The effect of this is that the AER sets a real risk free rate that is 1.4% less than the level which the Tribunal found in EnergyAustralia was inappropriate. The Tribunal directed the AER to use an earlier averaging period, as proposed by EnergyAustralia, which had higher spot CGS yields than during the AER's proposed averaging period.

83. It is relevant to note that, as I understand the legal constraints, the Australian Competition Tribunal did not have open to it the option of varying the market risk premium parameter that was to apply. This was as a consequence of transitional provisions in the Rules for the regulatory determination processes to apply to the NSW electricity distributors, the market risk premium was fixed at 6% with no ability to depart from that fixed value.

5.2 IPART Sydney Water decision

84. Since my March report IPART has issued its final decision on Sydney Water's regulated prices. This decision largely accepts the logic that I have set out in this and my other reports. The logic is well illustrated in the below quotes:

> *We note that there may be an inconsistency between using short-term data for the market-based parameters and using long-term data for the MRP and the equity beta. In particular, there may be an inversely proportional relationship between the MRP and the risk free rate. In periods of high investor risk aversion, there is a flight from risky assets to safe assets. This tends to push up the price and push down the yields on*

> *safe assets. For this reason, falling risk free rates tend to be associated with rising investor risk premiums (and vice versa).* [13]

And

> *The risk free rate has been affected by market volatility and prolonged weak market conditions. The change in these factors has potentially created a disparity between the risk free rate (for which we use short-term average data) and the market risk premium (for which we use long-term average data). In the current market circumstances, there is some evidence to support the view that expectations for the market risk premium have risen as bond yields have fallen. However, it is difficult to measure these short-term variations in expectations for the market risk premium.*
>
> *To guide our decision making on the point estimate for the WACC we estimated the long-term averages of the risk free rate, debt margin, inflation adjustment and the market risk premium. We found that using these long-term averages, the WACC would have a midpoint of 5.6%. This midpoint is 100 basis points higher than the midpoint of the range we estimated for the WACC.*
>
> *In light of this, we consider it appropriate to use the upper bound of our WACC range, 5.6%, in setting prices for Sydney Water for the next 4 years. We consider that this WACC addresses the higher level of market uncertainty at this time, and stakeholders' concerns in relation to the way that market parameters are estimated.*[14]

85. This upper bound is 80bp higher than IPART's midpoint as is described in section 3.7 of my companion report, the WACC estimate chosen by IPART is almost exactly the same as would be calculated simply adopting IPART's historical average risk free rate (5.4%) and leaving all other parameters at their midpoint estimates (including the spot cost of debt).

5.3 UK regulators

86. As discussed in my March 2012 report, UK regulators do not, as a rule, use a prevailing estimate of the government bond rate as the risk free rate when applying the CAPM. I refer to my March 2012 report for more specific examples in this regard.

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13 IPART, Review of prices for Sydney Water Corporation's water, sewerage, stormwater drainage and other services , Final Report, June 2012, p.210

14 Ibid, pp. 198-199

5.4 US regulators

87. I noted in my March 2012 report that energy regulators, along with most other monopoly regulators in the US, do not tend to reflect variations in the risk free rates, proxied by 10 year Treasury bond rates, in the allowed cost of equity for a regulated business. This reflects the fact that the US regulators attempt to estimate the cost of equity using a wholly forward looking methodology. As a result, any fall in Government bond yields due to a rise in risk aversion will tend to be automatically offset by higher allowed risk premiums.

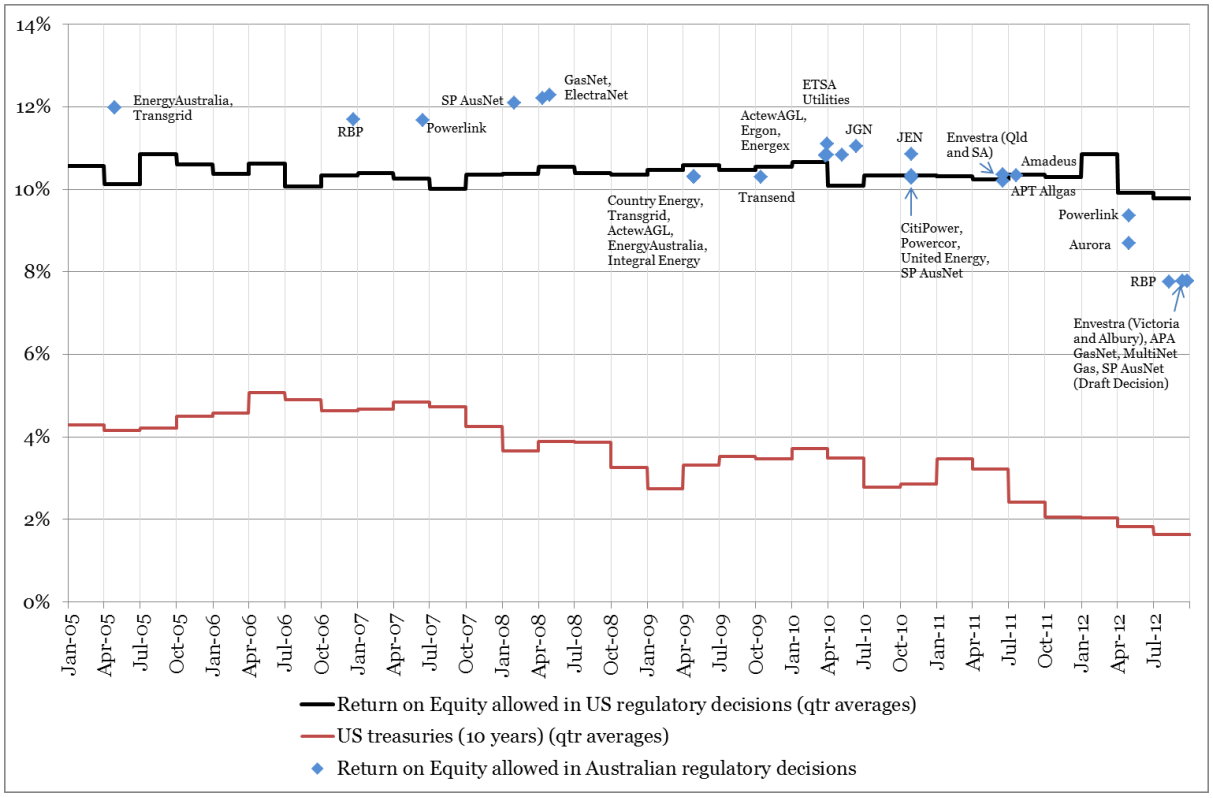
88. In my March report I presented a figure which illustrated the above by examining US decisions for regulated electricity transport businesses over the last 6 years – covering the periods before and after the global financial crisis. The figure showed that over this period the US government 10 year bond rates were volatile and were, at the time, around 300bp lower than (less than half) their pre-crisis peak (2.05% versus 5.07%). However, the allowed return did not move in line with movements in risk free rates – with the average return on equity allowed by US regulators relatively stable at 10.38% in the face of movements in risk free rates.

89. Figure 9 is an updated version of this figure. Adding the first three quarters of 2012 brings the five year average from 10.38% to 10.37%, suggesting that the average allowed return of equity remains very stable.

90. Superimposed over Figure 9 are the regulatory decisions from Figure 1 (decisions since 2005). It is clear that the AERs most recent decisions, in particular the draft decision relating to the Victorian distribution businesses and the final decision relating to RBP, are almost 3% below the return on equity allowed by US regulators on average. In examining this chart one should focus on the trend in the compensation for investment in each jurisdiction rather than the absolute level. The average compensation provided to equity investors in the US should be lower than for equivalent Australian decisions because US businesses are, on average, more lightly geared (less than 50%) than the AER's assumed 60% gearing level. The fact that, despite this difference in assumed gearing, recent Australian trends have led to much lower allowance in Australia is symptomatic of the problems I have identified with the AER methodology.

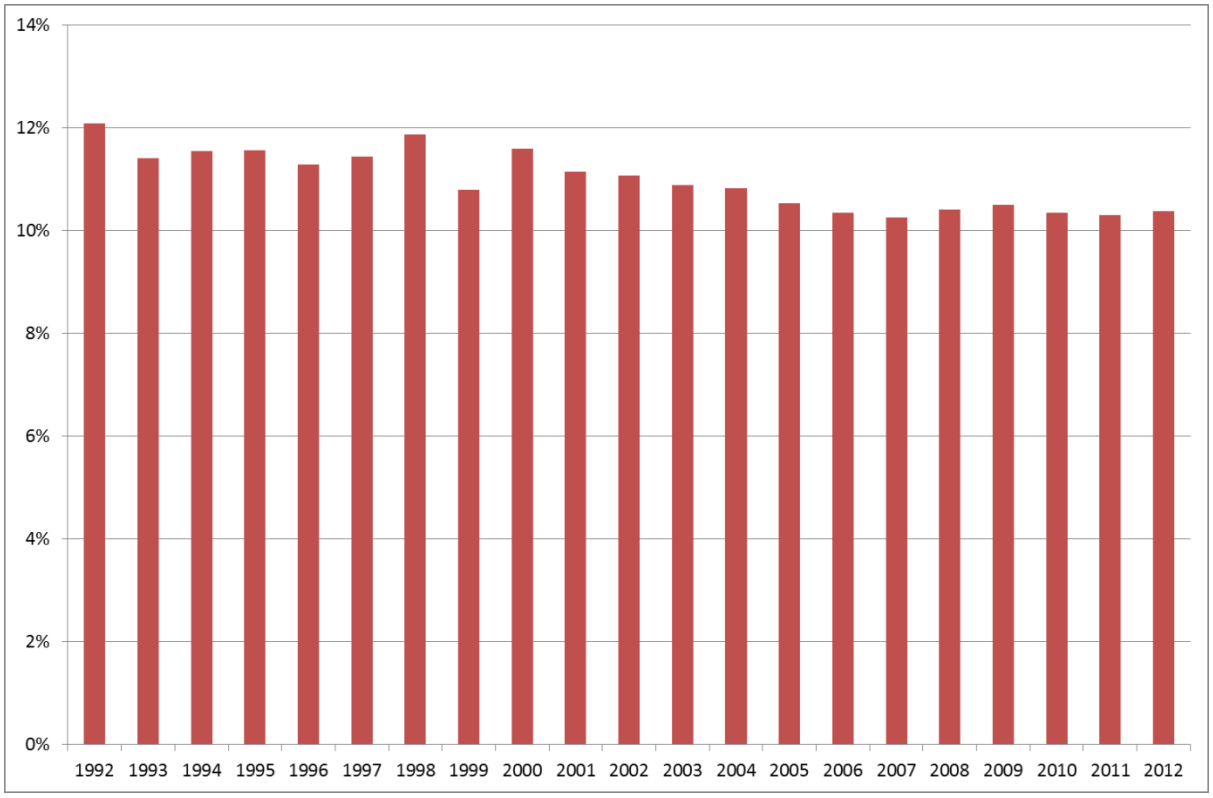
91. The same pattern of stability in the return on equity is true over an even longer time horizon as illustrated in Figure 10 (this is an update of Figure 14 from the March 2012 report). This figure the return on equity allowances for regulated US energy firms over the last 20 years, averaged across all regulatory decisions (average 10.94%).

Figure 9: US regulatory decisions over time broken into risk free rate and risk premium



Source: SNL Financial, Federal Reserve, CEG analysis

Figure 10: US regulatory return on equity decisions over 20 years – average per year



Source: SNL Financial, CEG analysis

92. I noted in the March 2012 report that an additional potential source of information on normal required returns for regulated businesses comes from US regulatory precedent involving the application of the DGM model. For the US regulatory decisions from 2005 to 2011 assessed in March 2012, I estimated the average ROE as 10.38% (11.01% over the last 20 years). The average equity premium was 6.57% and average 10 year US Treasury rate was 3.80%. This was based on DGM analysis performed by regulators. However, this was for an average gearing of 47.98%. Adjusting this to 60% gearing gives an average cost of equity of 12.36%.

93. For the US regulatory decisions Q1 2005 and Q3 2012 (inclusive), I estimate the average ROE as 10.37% (10.94% over the last 20 years). The average equity premium is 6.75% and average 10 year US Treasury rate is 3.61%. This is for an average gearing of 48.27%. Adjusting this to 60% gearing gives an average cost of equity of 12.35%, which is very marginally higher than that observed in the March 2012 report. [15]

[15] 12.35%=3.61%+(1-0.4827)/(1-0.6)*6.75%

6 Summary of update to cost of equity estimates

94. This section is effectively an update of the corresponding section in my March 2012 report, which also considered the consistency of each approach with the National Gas Rules and National Gas Law. The details of each methodology and its consistency with the Rules and Law and not reiterated here.

95. The four broad brush approaches to estimating the cost of equity include:

    - Methodology (i): Direct estimate for the firms of comparable risk to the reference services, using for example DGM analysis.
    - Methodology (ii): Direct estimate for the market portfolio with a separate process for estimating the adjustment for differences in risk between the market and the reference services.
    - Methodology (iii): Proxy the prevailing conditions in the market for funds by combining a historical average MRP with an internally consistent estimate of the (historical average) risk free rate;
    - Methodology (iv): Attempt to estimate a 'normal' level of equity risk premium associated with the reference services and add this to the prevailing spot estimate of the risk free rate (ie, the AER methodology).

96. The outcome of applying each of these methodologies is presented in Table 4 below, and can be compared to the outcome presented in the March 2012 report.

Table 4: Summary of results from each methodology

	Basis of estimate	Time period	Div. yield	DPS growth	Market return	RFR	MRP	Beta	Nominal cost of equity
(i)	**DGM for regulated businesses** DGM model applied to utility stocks in Australia. Range based on long run real dividend growth of between zero and in line with GDP	Dividend forecasts from 11 September 2012. Price and CGS averaged over 8 August to 11 September 2012	multiple	2.50-6.60%	n/a	Jointly estimated			**10.4 – 14.1%**
(ii)	**DGM for the market** Application of the AMP methodology to estimate prevailing MRP and then application of beta of 0.80 along with prevailing RFR	September 2012	5.34%*	6.6%	11.94%**	3.05%	8.89%	0.80	**10.16%**
(iii)	**Historical average RFR plus historical average MRP * beta** Historical CGS with MRP of 6% and beta of 0.8.** Assumes an indexed historical CGS of 3.28%, resulting in a real cost of equity of 8.1%, or 10.66% assuming inflation of 2.5%	Average historical CGS between 1 July 1993 and 28 September 2012	n/a	n/a	11.86%	3.28% real 5.86% nominal	6.0%	0.80	**10.66%**
(iv)	**AER methodology** Prevailing CGS with a risk free rate in August 2012 of 3.06%, MRP of 6.00% and a beta of 0.80	Average September 2012	n/a	n/a	9.05%	3.05%	6.00%	0.80	**7.85%**

Source: Various, CEG analysis
** Dividend yield scaled up using a factor of 1.1125*
*** For completeness, I note that if the Lally adjustments to my DGM estimate are implemented then this figure is 11.24%. These adjustments are discussed in section 3.3.1 of my companion report "Response to AER Vic gas draft decisions".*

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7 Conclusion

97. Consistent with my March 2012 report, there is persistent and unambiguous evidence that risk premiums in the market for funds have risen to offset the recent fall in CGS yields. The effect of this is that the prevailing cost of equity is at least as high as under normal market conditions – notwithstanding that the CGS yields are at historic lows. In these circumstances, it would be an error to estimate the cost of equity using prevailing CGS yields in combination with an historical average estimate of the market risk premium.

98. Alternative methodologies consistent with Rule 87(1) of the NGR and section 24(2) and (5) of the NGL involve estimating the cost of equity using:

    - A DGM estimate of the cost of equity for firms which experience risks that are comparable to those confronted by firms which provide the reference services.
    - DGM estimates of the cost of equity for the market portfolio (RoE_{Market}) and a separate process for estimating the adjustment for differences in risk between the market and the reference services (ie, a beta different to 1.0).
    - An historical average estimate of the risk free rate that is internally consistent with the historical average estimate of the market risk premium.

99. In my view, these approaches result in an estimate of the cost of equity that is at least 10.16%. This is more than 2% higher than is estimated using prevailing CGS yields in conjunction with the AER's most recently used estimates of the MRP (6%) and equity beta (0.8) estimates (which results in a 7.85% estimate).

The AER Approach to Establishing the Cost of Equity – Analysis of the Method Used to Establish the Risk Free Rate and the Market Risk Premium

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[1] Note that the views expressed in this report are entirely my own and should in no way be taken to reflect those of the Xfi Centre, University of Exeter.

The AER Approach to Establishing the Cost of Equity – Analysis of the Method Used to Establish the Risk Free Rate and the Market Risk Premium

Introduction

I have been asked to prepare an expert report which considers the following issues arising from the AER's recent decision in the Roma to Brisbane Pipeline Final Decision and the Draft Decisions for the Gas Distributors (Envestra, Multinet and SP AusNet) and APA GasNet (together, the Gas Businesses)[2]: (a) Is the AER's approach to estimating the cost of equity in these decisions consistent with the approach adopted by the UK regulator, Ofgem and UK appeals body, the Competition Commission?; (b) In light of the UK regulatory approach, is the AER's approach to estimating the cost of equity for the Gas Businesses likely to result in a rate of return that satisfies the requirements of Rule 87(1) of the National Gas Rules that: "*The rate of return on capital is to be commensurate with prevailing conditions in the market for funds and the risks involved in providing reference services"*; (c) In light of the recent Tribunal findings on the cost of capital, the recent IPART Review of water prices for the Sydney Desalination Plant Pty Ltd, and the implications of UK regulatory practice for Australia, how might the gas businesses best estimate the cost of equity in order to satisfy the requirements of 87(1) and 87(2) of the National Gas Rules? In answering this question, I have been asked to explain the extent to which the UK regulatory approach, including the regulator's objectives, is likely to be relevant in Australia.

Executive Summary

1. In forming my views on the above question, I draw on theory and also contrast the AER position with that in recent UK regulatory cases. I focus on those regulators who make full use of the Capital Asset Pricing Model (CAPM) preferred by the AER, and in particular recent appeals cases to the UK Competition Commission (CC), which is the body to which regulatory pricing appeals are made in the UK.

2. The general summary of the UK process is that a number of different regulators set prices for utilities based upon an expected return (the weighted average cost of capital, WACC) applied to a Regulatory Asset Base (RAB). Prices are then set using an RPI+/-x formula, which in effect governs the timing of the revenue stream, though should not influence its present value. The final price determination is made after conducting a "financeability" test, essentially a forecast of the revenues and costs implied by the allowed WACC. This test is used to determine whether the assumed levels of debt can be serviced whilst the debt remains at investment grade. This is interpreted as an NPV-neutral adjustment, i.e. an adjustment to the "glide path" of revenues rather than to the present value of revenues.

[2] I am aware that the report will also be used by Envestra for the AER's review of Envestra's Access Arrangement for its Albury Distribution Network.

3. The relevant utilities and their regulators are: Electricity and Gas networks, regulated by Ofgem; Regulated Airports (Heathrow, Gatwick and Stansted), currently regulated by the CAA but with automatic referral to the CC; the communications industry, where price regulation is concerned with access to BT networks and mobile telephone termination charges, regulated by Ofcom; the water industry, consisting of water only companies (WoCs) and water and sewerage companies (WaSCs), regulated by Ofwat. In addition, Network Rail is regulated by the Office of the Rail Regulator (ORR).

4. In summary, my view is that the AER is in error in its assessment of the cost of equity capital for the Gas Businesses and has significantly under-estimated that cost of equity.

5. It has made such an error because it has been inconsistent in its approach to estimating the market risk premium (MRP) and in doing so has combined two different measures of the risk free rate into its Capital Asset Pricing Model (CAPM) estimate of the cost of equity. In my view, combining such different measures is illogical and is therefore "unreasonable", in the sense set out in paragraphs 50-55 of the Australian Competition Tribunal's Decision of 11th January 2012.

6. In more detail, it has combined an MRP that has been largely derived from historical observation with a current spot rate estimate of the risk free rate. In doing so, it has assumed that the MRP is constant, and has made no allowance for any possible inverse relationship between the risk free rate and the MRP. Other regulators, both in the UK and in Australia (IPART) are aware of this potential relationship and have made due allowance for it.

7. The AER could have adopted one of two consistent approaches that would have avoided this error. It could either have estimated the expected return on the market directly, and used this estimate with its preferred risk free rate in the CAPM. As I explain below, this would have been in line with the approach recommended to UK regulators in the Smithers' Report, 2003.

8. Alternatively, it could have made allowance for the exceptional conditions in global government bond markets, following the global financial crisis and international quantitative easing programmes, and used an estimate of the risk free rate determined largely from historically observed rates. This would then have been consistent with its use of an MRP based largely on historically observed MRPs.

A Comparison of the AER treatment of RF and MRP in the Case Compared with Theory

9. I note that the AER judgement is delivered in nominal terms. In the Gas Distribution and APA GasNet cases, the AER starts with the use of the current yield on the ten year Commonwealth Government Securities (CGS) as the proxy for the risk free rate (RF). This yield is 2.98%. The forecast inflation rate for the

period under consideration is 2.5% which implies the real risk free rate is 0.47%.[3] Two questions arise with regard to this rate. First, is this an adequate proxy for RF in the context of the CAPM? Second, is the RF proxy consistent with the other elements used in the CAPM as applied in this case?

10. Second, the MRP is taken as 6% nominal. The implication is that the expected return E(RM) on the Australian market in nominal terms is 8.98% nominal, or 6.32% in real terms.[4]

11. At this point it is worth emphasising exactly what asset pricing theory tells us that the basic CAPM relationship is, in terms of deriving the expected return on any asset (R_i):

$$R_i = RF + \beta_i(E[RM] - RF) \quad (1)$$

12. The term in parentheses is often abbreviated to the "equity risk premium" or "market risk premium", but writing the equation out in its original form serves as a reminder that the precise definition of MRP is the expected return on the market (E[RM]) minus the risk free rate, RF. As Jenkinson (1993) points out, the important point is that there is only *one* RF term on the right hand side of the CAPM, not two.

13. A very common error, which has been discussed in recent UK regulatory appeals, is to implicitly assume the two RF terms are different. An example would be where a current estimate of the risk free rate (say the yield on a government bond) is combined with an historically derived estimate of the MRP. In such a case, the version of the CAPM being employed is actually:

$$R_i = RF_{current} + \beta_i(RM_{historic} - RF_{historic}) \quad (2)$$

14. This simply illustrates Jenkinson's point that two different RF terms have been employed, and there is no theoretical validity in such a model. In general, the correct model to apply is:

$$E(R_i) = RF + \beta_i(E[RM] - RF) \quad (3)$$

Where $E(R_i)$ and $E(RM)$ denotes the expected return on the equity of firm *i* and the market respectively.

15. A central question is how best to estimate the common components in (3), namely *RF* and *E(RM)*. As The Smithers & Co Report, 2003, ("The Smithers Report") makes clear, given the problem is to estimate expected returns, it is important that in assessing long run averages of RM and RF, the data are treated consistently. Second, if long run averages are to be used, then it is important to select a long enough period so that expectations errors cancel out.

16. Clearly, if long run historical returns are the best guide to expected returns, RM expectations could, in principle, be estimated by adding some historical estimate of

[3] The precise calculation is that (1 + real rate) = (1 + nominal rate)/(1 + expected inflation rate)
[4] See footnote 1.

the MRP to the estimate of RF, but only if the risk-free rate is stable over time, implying that the market risk premium is also stable. Alternatively, RM expectations can be estimated directly from the historical estimate of the RM series itself. Doing so implies that it is the return on equities that is stable, and places no constraint on the stability of either RF or MRP.

17. The Smithers Report is absolutely unequivocal on this point, and by examining the international cross-section of realised returns from Dimson, Marsh and Staunton (2001) shows that the return on equities is more stable than the MRP. The real risk free rate does *not* have a stable mean, based on both the international evidence on the cross-section of real risk free rates, and on a very long run analysis that uses Siegel's (1998) US data set. As the real RF is not stable, the authors conclude that the MRP is less statistically reliable.[5] Note that this has particularly serious implications for Australia, as the evidence in Brailsford, Handley and Maheswaran (2008, 2012), which the AER appear to rely on at pp 67-69 of the Roma to Brisbane Pipeline case and which forms the basis of the Handley data cited at pp 106-107 of the SP AusNet Draft Decision, makes it clear that there are structural changes in their bond series at several points. So if the problem of a non-stable mean is found in the international data, it is not likely to be less of a problem in Australia where the underlying bonds used to compute the series change through time.

18. An updated illustration of the international cross-sectional data is provided in Figure 1.[6] The chart clearly shows that the volatility of the real MRP is greater than the volatility of the real RM (precisely, the respective standard deviations are 1.66% and 1.26% respectively). As can be seen the "risk free" return shows considerable cross-sectional volatility, a problem in part caused by inflation risk.

19. Fortunately, as The Smithers Report makes clear, the solution to this problem is straightforward. As the return on equities series does appear to have a stable mean, one can simply use that series directly to obtain estimates of *E(RM)* in the CAPM (i.e. in [3] above).

20. Had the AER used this (statistically valid) approach in establishing the parameters in its estimate, still using the data it draws upon in Table 2.2, then the Brailsford et al (2008, 2012) data underlying Table 2.2 of The Roma Pipeline case (see footnote 146) and Table 4.3 is the APA Gasnet case, suitably updated, would have shown that the arithmetic average of the *real* RM of 8.6% for the Australian market over the period for which the authors regard reliable data as having been available (1958-2011), assuming that gamma is 0.25.[7] Coupled with the assumed inflation rate of 2. 5% in the Gas Business cases, this implies a nominal estimate of the expected return on the market of 11.31%, or 11.03% with zero adjustment for imputation credits. This contrasts with the AER's implied estimate of this same

[5] See also the 2006 Smithers & Co report for Ofgem.
[6] The figures underlying this chart are from Dimson, Marsh and Staunton (2012), Tables 2, 5 and 10.
[7] The equivalent estimate of the real Government bond return over this period was 2.7% whilst the mean real MRP was 5.90%. If $\gamma = 0$, i.e. the value of tax credits is assumed to be zero, the equivalent real RM is 8.33% and the real MRP is 5.63%.

E(RM) of 8.98%, which represents a baseline cost of equity for the market of 233 basis points lower than would appear to be justified by the historical data series in Brailsford et al (2012).

21. We can anchor this 1958-2005 estimate by using the most widely-cited international evidence of Dimson, Marsh and Staunton (2012), henceforth DMS. They show that for 1900-2011, the real mean realised RM for Australia is 8.9% (arithmetic).[8] The mean long run real bond rate is 2.4% (arithmetic). Again applying the forecast inflation rate of 2.5%, were one to use these historical estimates of real RM as an estimate the expected RM, the arithmetic average implies an *E(RM)* of 11.62%. Note that the DMS figures assume that the value of imputation tax credits is zero.

22. As the Smithers Report makes clear, the appropriate way to derive a market risk premium is to calculate it as the difference between the *E(RM)* and RF estimates. At an RF of 2.98%, this implied MRP is 8.33% on an arithmetic average basis, using the Brailsford et al (2011) data and a γ value of 0.25, and 8.64% using DMS data and a γ value of zero. The APA GasNet proposed E(RM) estimate of 8.5% is between these two estimates.

23. Note that the authors of the Smithers Report see a considerable advantage to regulators in focusing on the relative stability of the market return: *"The relatively greater importance of the market return is fortunate for the regulators, since we argue that there is considerably more uncertainty about the true historic risk-free rate, and hence the equity premium, than there is about the market return itself. The historic size of the equity premium is still the subject of considerable puzzlement and controversy amongst academics; but this is largely due to the historic behaviour of the risk-free rate (proxied by the short-term interest rate). In contrast, we summarise a range of evidence that the equity return has, over reasonably long samples, been fairly stable both over time, and across different markets"*

24. This is "fortunate" because the derivation of expected return from the CAPM given by (3) above can be re-written as:

25. $E(R_i) = (1 - \beta_i)RF + \beta_i E(RM)$ (4)

26. So provided the beta is greater than 0.5 (which is the case for most utilities in general, and is the case here where the Gas Businesses' beta is 0.8), then greater weight is placed on the second component of (4), the E(RM), for which estimates are less uncertain.

27. The appropriate proxy for the risk free rate is the subject of some debate. Both the Smithers Report 2003 and the 2006 Smithers & Co report argue that the lack of evidence for a stable mean lends some weight to the case for using current estimates rather than historical averages. However, they then draw attention to the

[8] Dimson, Marsh and Staunton (2012) Credit Suisse Global Investment Returns Sourcebook (Table 13, p.57)

need to take account of distortions to bond markets, and so anchor their RF estimates using a "Taylor Rule".[9] This leads them to recommend a 2.5% real RF.

28. However, the conclusion of the Smithers Report[10] with regard to regulatory estimation using the CAPM is worth stressing: *"we regard the standard approach to building up the cost of equity, from estimates of the safe rate and the equity premium, as problematic. We would recommend, instead, that estimates should be derived from estimates of the aggregate equity return (the cost of equity for the average firm), and the safe rate."*

29. This message has been heeded by UK regulators and is explicitly referred to in recent regulatory cases and in regulatory appeals to the UK Competition Commission (see below).

30. The question in this case is therefore whether the AER has consistently applied version (3) of the CAPM in this case, or whether it has, however inadvertently, committed the error described in (2). In this regard, I note that the AER at no point discussed an expected RM. In effect, it simply assumes that adding an MRP to its chosen RF will give the correct estimate of RM.

31. At 2.3.1 in the Roma to Brisbane Pipeline case the AER makes clear that its chosen estimate for RF is an average of 10 year CGS yields for the period 25th June to 20th July 2012, whilst in the Gas Businesses Case the average is for the 20 business days ended on the 10th of August. To consistently apply the CAPM it should, therefore, have used an estimate of the expected RM on a reasonable basis, and subtracted from that the same average of 10 year CGS yields. The evidence in 2.3.2 of the Roma to Brisbane Pipeline case and in the Gas Business cases suggest that they have not done so. Table 2.2 in the Roma to Brisbane Pipeline case and, for example, Table 4.3 (p.87) in the APA GasNet case shows estimates of the historically derived MRP. For the reasons set out above, whilst it would have been correct to use these historical data series to measure historic RM directly, it is not valid to take an MRP from this historical data series and match it with an RF derived from forward looking data.

32. Had they adopted the approach recommended in the Smither's Report (2003), then the estimated cost of equity for the firm (following 20 above) would have been 2.98% + 0.8 x (11.31% - 2.98%) = 9.64%.

33. It would, however, have been consistent to estimate the CAPM on the basis of both an historical averages of RF and the MRP. Given that the estimates are made in *nominal* terms, a consistent approach would have been to calculate the real return, based upon the arithmetic means from the Brailsford et al (2012) updated data of a 2.7% real RF and a 5.9% MRP, then uplift these to allow for the compounding effect of the estimated inflation rate.

[9] To quote from a Federal Reserve working paper by Orphanides (2007)"Taylor rules are simple monetary policy rules that prescribe how a central bank should adjust its interest rate policy instrument in a systematic manner in response to developments in inflation and macroeconomic activity." See: http://www.federalreserve.gov/pubs/feds/2007/200718/200718pap.pdf

[10] P.48

34. This would have resulted in a real cost of equity in the case of 2.7% + (0.8 x 5.9%) = 7.42%, and a nominal cost of equity of 10.10%.[11]

35. Note that the consistently estimated approaches in 32 and 34 give cost of equity for the firm that are within 46 basis points of each other, whilst both are clearly some way in excess of the allowed cost of equity in this case of 7.78%.

36. The substantial point is that in not treating the historical data consistently, the AER has *either* under-estimated the cost of capital implied by under-estimating the MRP, or it has under-estimated the cost of capital by under-estimating the RF component of (3). Either interpretation is equally valid, but the key point is that the AER's approach is producing an error as indicated by (2).

37. A curiosity is that the AER apparently recognise that the MRP and the RFR may be negatively correlated at several points. For example, in Appendix B, pages 4-5 of the Multinet case, the AER states "a flight to quality *changes investor expectations and perceptions of the relative value of a risk free asset* and would not undermine the risk-free nature of the asset".[12] It is making this point to underscore why it believes that the current CGS yield is the appropriate measure of RF, but in doing so it is blind to the corollary, which is that if investors' perceptions of the *relative* risk of the risk free asset changes, either equity prices themselves will fall, implying an increase in the E(RM), or, if equity prices are unaffected, then E(RM) will stay the same. The implication of either outcome must be that the MRP, measured as the difference in expected return between the risk free asset and a risky one, will increase. This possible linkage is explicitly recognised by other regulators, both in the UK and in Australia, as I discuss further below.

38. Similarly, when discussing the spread between CGS yields and other debt yields, at Appendix B, p7 of the Multinet case "The AER accepts that the spread between the yield on CGS and other debt securities has increased since the onset of the GFC". It seems logically inconsistent to recognise that the MRP on corporate bonds has increased, yet refuse to acknowledge that the MRP on equities has increased.

39. At p.103 (attachment 4) in the Multinet case, the AER acknowledges "a possible negative relationship between the risk free rate and the MRP in certain circumstances". It then cites Associate Professor Lally as describing such a relationship as "plausible" before observing Australia is not in depressed economic conditions, which fails to acknowledge that Australia is part of a globally integrated capital market (see also 43 below). He also fails to acknowledge that the subsequent correction in the ten year MRP he speculates upon could be caused by the RFR rising rather than the E(RM) falling. This observation highlights the importance of consistent measurement approaches for the MRP and RF, which, as already explained, is not achieved by combining a long term average MRP with a current Rf. Lally's dismissal of the importance of the relationship between MRP and RF seems to be almost entirely speculative.

[11] The equivalent cost of equity if γ is assumed to be zero is 9.88%.
[12] Emphasis added.

40. There are other logical inconsistencies in the AER arguments in the Gas Business cases. For example, at Appendix B, page 12 of the Multinet report, it argues against using long run average historical estimates of the risk free rate, and states "This is because...there is limited evidence that the cost of equity is stable though time, a long run average is not consistent with the present value principle".[13] Yet in using an MRP over the CGS yield, the AER assumes that the MRP is more stable than the cost of equity itself. There is no evidence produced anywhere in the cases to justify this position. At page 93 in Appendix B of the Multinet case, the AER cites Goyal and Welch (2008) in apparent support of a stable MRP. There are several problems here. First, Goyal and Welch (2008) do not compare the stability of MRP with that of the return on the market. As noted in 17 and 18 above, when this comparison is made in real terms, there is evidence that RM is more stable than the MRP. Second, Goyal and Welch (2008) specifically examines the stability of a risk premium measured relative to a short term Treasury Bill rate, *not* relative to a ten year government bond rate. Third, Goyal and Welch's findings are challenged by two other papers in the same edition of Review of Financial Studies (Cochrane [2008] and Campbell and Thompson [2008]). The AER has fixed on the Goyal and Welch study to justify its position, but has apparently disregarded the criticisms of their paper expressed in the other two studies published at the same time in the same journal.

41. Furthermore, this issue is explicitly recognised in the recent IPART Review of water prices for the Sydney Desalination Plant Pty Ltd (SDP), where at p.94 they state; "*We acknowledge the argument that there may be greater stability in the sum of the market risk premium and the risk free rate (i.e,, the expected market return) than in the individual components. In the current market circumstances, there is some evidence, as SDP noted, to support the view that expectations for the market risk premium have risen as bond yields have fallen*." Noting that it can be difficult to estimate short term expectation of the MRP, they then say that "*An alternative approach is to look at the long term averages as a reference point for the sum of the market risk premium and risk free rate*". They next go on to explain "*Therefore, to guide our decision-making on the point estimate for the WACC, we estimated the long term averages of the risk free rate, inflation rate and the market risk premium*".

[13] Note that a discussion of the present value principle evidence on which the AER relies is the subject of a separate expert witness report.

42. The fact that the AER choose to ignore this important evidence is extraordinary, given that they themselves cite IPART's recent decisions in support of their chosen level of the MRP, for example at Table 4.29 of the SPAusNet Draft Decision. In citing, inter alia, this IPART decision they justify the relevance of such recent decisions with the following comment at p.110 of that document: "The AER considers the decisions by other Australian regulators are relevant because the MRP is an economy wide measure". It would seem self evident that the risk free rate is also an "economy wide measure" and it is highly misleading to cite one piece of evidence from another regulator without fully acknowledging the context in which that regulator reached its judgement. IPART correctly considered the importance of historical averages in forming its assessment of the WACC. The AER did not.

43. The potential under-estimation of the RF component is given emphasis by considering that the ten-year bond rate itself has two components – an underlying short term risk free rate (the Treasury Bill rate) and a maturity premium. Historically, DMS Table 12 shows that the mean real maturity premium for Australia has been 1.4% p.a.. The Global mean is 1.2%. Inflation uncertainty means that it highly likely that investors would normally require a maturity premium for holding longer maturity bonds. Despite recent market movements, DMS (page 39) estimate a forward real maturity premium of around 1% p.a., globally. The implication is that both the short term risk free rate and the maturity premium are at very low levels, highlighting the unusual conditions that prevail in risk-free asset markets.

44. At Appendix B, page 96 in the Multinet case, the AER makes the statement that the MRP is for a domestic CAPM, so that overseas evidence has limited relevance. This will not be the case in globally integrated markets, since the risk free rate will be determined by the International Fisher equilibrium relationships (with appropriate adjustment for default risk), and the MRP should be related to the relative systematic risk of the Australian market in the context of a global CAPM. The Smithers Report specifically acknowledges the importance of international evidence. In the case of the Gas Businesses, one cannot ignore the importance of global financial forces. I return to this point in 51 below.

45. The AER discusses other regulatory cases in Australia, though not the IPART Review referred to above. At 56-75 below, I set out some recent UK cases, not to draw a contrast with the values of parameters (which one would expect to be different for Australia, as indeed DMS show) but rather to show the way in which the methodologies for setting the common components of the CAPM vary between countries.

46. In its assessment of its judgement of the MRP, the AER cites survey evidence, for example at p.111 of the SP AusNet Draft Decision. The surveys quoted suffer from a number of problems. First, they are not all consistent with the period from which the RF is derived. Clearly there has been downward pressure on Government bond and Treasury Bill rates throughout that period. Second, it is unclear whether these estimates relate to arithmetic or geometric means. Third, it is unclear which measure of RF the MRP relates to. Finally, at least one of these

surveys refuses to accept that many academics recommend the separate calculation of components rather than an MRP. This leads to some academics not responding to the survey and a biased sample may result. But second, it highlights the fact that according to theory and the empirical evidence discussed above, these surveys are simply asking the wrong question, and so cannot be relied upon.

47. The AER's consideration of the dividend growth model (DGM) estimates conflates their use in two entirely separate contexts. In the US, the model is used at a *firm* level, using analysts' forecasts. Whether or not the US has "higher quality" data, as suggested in footnote 173 of the Roma to Brisbane Pipeline report, this rather misses the point that the use of DGM models in such a fashion suffers from a potential problem of circularity. In the context in which the model is being presented in Table 2.5 of the Roma to Brisbane Pipeline Report and Table B.4 of the Multinet Report, it is clear that the DGM is being used to estimate a market-wide cost of equity. Although the precise detail of the calculations are not given, it seems clear that the way in which the MRP is being calculated is internally consistent, in that a forward estimate of the E(RM) is being derived, from which is subtracted some current estimate of RF. At page 37 of Appendix B, the AER seems to entirely miss the point in saying "NERA's DGM estimates also illustrated this problem [the problem being that the MRP varies as the risk free rate changes].....This difference was the result of the lower risk free rate". But this, of course, is exactly what one would expect if the E(RM) is stable but the risk free rate is not.

48. Whilst the point about the difficulty of forward projection is well understood, one way of objectifying such projections is to assume mean reversion in the dividend yield. The approach is that of Fama and French (2002) and is described in detail in the appendix. Briefly, the theory behind such a decomposition is that some elements of historical return can be attributed to revision in expectations or higher than expected realisations in firm cash flows. By considering only the mean dividend yield and the historically achieved growth, it is possible to estimate what future returns on the market would have expected at points in the past given mean reversion in these parameters. Using the updated Brailsford et al (2012) data for the period 1958-2011, assuming γ=0.25 once imputation credits start in 1988, and applying the Fama and French (2002) methodology, the implied real expected historical dividend yield and growth series would give an estimated *real* E(RM) of 8.14%.[14]

49. Uplifting this using the AER inflation forecast we obtain a nominal E(RM) of 11.03% which implies that the expected MRP at the AER risk free rate of 2.98% is 8.05% (7.62% assuming γ=0). As a way of anchoring this estimate, an alternative calculation can be made using the approach in Dimson et al (2007), updated using the 1900-2011 data series from DMS 2012. Their approach does not allow for any imputation tax credit value, and uses a log decomposition approach, and gives an arithmetic average implied MRP estimate of 7.45% to 7.97% (see Appendix for detail). Whilst these two alternative estimates are derived from a completely different estimation process, the range of these estimates is nonetheless consistent

[14] See Appendix for details of the calculation.

with the Table B.2 estimates. The fact that these cross-checks agree suggests that the DGM should not be so readily dismissed as a technique for establishing the E(RM). Finally, it should be noted that Professor Lally's comments, quoted at *inter alia*, Appendix B p.37 of the SP AusNet case, seem at variance with the evidence presented above which shows that globally, the E(RM) is more stable than the MRP.

50. A number of further points are made from pages 81-84 in the Roma to Brisbane Pipeline case and the Gas Business cases concerning the estimation of the common parameters in the CAPM. These are fully addressed by the theoretical and empirical discussion above, but to reiterate, besides the theoretical preference for considering the E(RM) and RF components directly, rather than relying on an MRP estimate (for example, the AER's perspective at 4.3.4. in the Multinet case is that MRP is regarded as "an input", whereas theoretically this is not strictly the case), there is evidence that RM is more stable than the MRP. These points have been explicitly recognised in recent UK determinations (see below), and implicitly in the IPART SDP case cited by the AER (as discussed above at 41-41), yet apparently disregarded by the AER.

51. One further point needs to be made concerning the RF estimate. It needs to be borne in mind that the objective is to find a proxy for the unobservable return on a "pure" risk free asset. This cannot be simply assumed to be the return on a 10-year CGS. As discussed at 43 above, this bond carries a maturity premium, which historically has averaged 1.4% p.a.. It seems clear that current yield curves exhibit a maturity premium well below historical averages, and there is a case for considering the impact that mean reversion in this premium would have on the ten year risk free rate estimate. Second, as a nominal instrument the return on such a bond is subject to inflation risk. Third, there is a coupon reinvestment risk. Fourth, insofar as the aim is to try and estimate a ten year RF that is consistent with the AER's objective of estimating a ten year MRP, at least some attention should be paid to the impact of any distortions caused by pension fund funding rules and also by the extraordinary actions of central banks in pursuing quantitative easing (QE). Whilst QE has not been undertaken in Australia, it seems highly likely there will have been spill-over effects on CGS yields from such policies being pursued in other global markets. UK regulators have explicitly recognised the effects of such distortions (see below). Of course, if the UK practice of separately estimating components of the CAPM is followed, any uplift to RF has no impact on the cost of equity for an average (beta equal to one) company. However, it would have a material impact given that the AER's approach is to add a fixed MRP to a spot RF estimate, irrespective of what that spot estimate is.

52. As noted above, these issues have been considered in the recent IPART-SDP Review. Of particular note is IPART's decision to consider long term averages in estimating the risk free rate, which in Table 9.5, p.95 of their review is shown to give an estimated nominal RF (at an inflation rate of 2.5%) of 5.4%. It is clear that the AER are aware of IPART's views on this, given they cite their report, but they simply ignore the importance of the points made in their draft decisions relating to the Gas Businesses. As I set out below, the UK regulatory approach also makes

use of longer run historical averages of gilt and index-linked gilt rates when establishing RF.

53. This issue is of particular importance given the highly unusual circumstances in global financial markets at present. The implied real risk free rate in the AER's decision is, as noted above, only 0.47%, an exceptionally low figure. To set this in context, the updated Brailsford et al (2012) data shows that the long run average real yield on CGRs was 2.45%, with an average since 1958 of 2.7%, since 1988 of 3.84% and an average over the past ten and twenty years of 2.3% and 3.49% respectively.

54. As I note above, consistency demands that if the CAPM is to be applied using historical estimates, then the period over which the MRP is estimated should directly match the period over which RF is estimated. To the extent that the 6% MRP adopted by the AER is largely, but not exclusively, determined by the historical evidence, it is difficult to be prescriptive about exactly which estimate of RF is best combined with this in current market circumstances, but the pragmatic solution of both IPART and UK regulators (described in detail below) is to use a weighted average of the more recent historical averages and the current spot rate, with the majority of the weight being on the former. Given considerable uncertainty exists about both the "true" RF and MRP, such an approach is reasonable, in contrast to the AER's current position which is not.

55. Alternatively, one can accept a spot rate estimate of RF, but recognising that E(RM) will not move in line with RF, employ a direct estimate of E(RM), as described in 20 above. What is clearly invalid is to combine a current spot yield on a CGR, determined in wholly exceptional market conditions, with a largely historically determined MRP. This is the AER's position in the Gas Businesses case.

Recent determinations in the UK

56. Over the past five years, the following price determinations have been made:

    2006 Gas and Electricity Transmission Networks (Ofgem). Due to expire in March 2012, this has been extended for a further year due to the introduction of the new RIIO (**R**evenue using **I**ncentives to deliver **I**nnovation and **O**utputs) framework. RIIO would not appear to have any direct implications for the process by which WACC is set.

    2007 Gas Distribution Networks (Ofgem). Five year review.[15]

    2007 CC/CAA London Heathrow and London Gatwick. Five year review. On cost of capital, the CAA accepted the CC's recommendations in full.[16]

    2008 CC/CAA London Stansted. Five year review. On cost of capital, the CAA accepted the CC's recommendations in full.[17]

[15] See: http://www.ofgem.gov.uk/Networks/GasDistr/GDPCR7-13/Documents1/final%20proposals.pdf

[16] See: http://www.competition-commission.org.uk/assets/competitioncommission/docs/pdf/non-inquiry/rep_pub/reports/2007/fulltext/532af.pdf

[17] For CC report concerning cost of capital see: http://www.competition-commission.org.uk/assets/competitioncommission/docs/pdf/non-inquiry/rep_pub/reports/2008/fulltext/539al.pdf. For the CAA report see: http://www.caa.co.uk/docs/5/ergdocs/081209StanstedProposals.pdf

2008 Network Rail (ORR).[18]
2009 Water Companies (Ofwat). 2010-15 price review.[19]
2009 BT Openreach (Ofcom)[20]
2009 Electricity Distribution (Ofgem)[21]
2011 Mobile Call Termination charges (Ofcom)[22]
2011 Transmission Networks (TPCR4) Roll-over (Ofgem), pending the introduction of RIIO.[23]
2012 BT Local Loop Unbundling and Wholesale Line Rental (Ofcom)[24]

Recent Appeals to CC on Price Determination

57. The following price determination appeals have been referred to the CC:
    2009 Hutchinson 3G UK v Ofcom and BT v Ofcom. Mobile Call Termination. Note that there was no direct appeal on WACC in this case.[25]
    2009 Sutton and East Surrey Water v Ofwat.[26]
    2010 Bristol Water v Ofwat.[27]
    2010 Carphone Warehouse Group v Ofcom. Wholesale Line Rental.[28]
    2010 Carphone Warehouse Group v Ofcom. Local Loop Unbundling.[29]
    2010 Cable and Wireless UK v Ofcom. Leased Lines Charge Control.[30]
    2012 BT v Ofcom. Wholesale Broadband Access charge control.[31]
    2012 BT v Ofcom; Everything Everywhere v Ofcom; Hutchinson 3G UK v Ofcom and Vodafone v Ofcom. Wholesale Mobile Voice Call Termination.[32]
58. Note also that the Local Loop Unbundling (LLU) and Wholesale Line Rental (WLR) Price Determination is currently the subject of a CC appeal by BT.

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[18] See: http://www.rail-reg.gov.uk/upload/pdf/368.pdf for ORR report and http://www.rail-reg.gov.uk/upload/pdf/pr08-cepacoc-010408.pdf for the CEPA report.
[19] See: http://www.ofwat.gov.uk/pricereview/pr09phase3/det_pr09_finalfull.pdf and http://www.ofwat.gov.uk/pricereview/pr09phase3/rpt_com_20091126fdcoc.pdf
[20] See: http://stakeholders.ofcom.org.uk/binaries/consultations/openreachframework/statement/annexes.pdf
[21] See: http://www.ofgem.gov.uk/Networks/ElecDist/PriceCntrls/DPCR5/Documents1/FP_5_Financial%20Issues.pdf
[22] See: http://stakeholders.ofcom.org.uk/binaries/consultations/mtr/statement/MCT_statement.pdf
[23] See: http://www.ofgem.gov.uk/Networks/Trans/PriceControls/TPCR4Roll-over/Documents1/TPCR4_Rollover_Final_Proposals.pdf
[24] See: http://stakeholders.ofcom.org.uk/binaries/consultations/wlr-cc-2011/statement/annexesMarch12.pdf
[25] See: http://www.competition-commission.org.uk/assets/competitioncommission/docs/pdf/non-inquiry/appeals/communications_act/mobile_phones_determination.pdf
[26] For WACC detail see: http://www.competition-commission.org.uk/assets/competitioncommission/docs/pdf/non-inquiry/rep_pub/reports/2009/fulltext/549_appendices.pdf
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[32] http://www.competition-commission.org.uk/assets/competitioncommission/docs/appeals/telecommunications-price-control-appeals/final_determination.pdf

Basic methodology in the above cases

59. In general, all the above cases use some version of WACC (whether pre tax or "vanilla", and whether estimated in real or nominal terms), and all except Ofgem and the ORR make full and detailed use of the CAPM. In the 2007 Gas Distribution Networks review Ofgem states "We continue to take the view that the allowed return on equity should reflect the balance of all risks that will be faced by companies under the price control proposals, including both systematic and non-systematic risk, to provide appropriate incentives to manage these risks effectively and to invest efficiently in maintaining and developing their networks. We therefore propose to continue our approach of basing the allowed rate of return on equity on the estimated equilibrium level of total market returns". This policy seems to be continued in the 2011 "Roll Over" document, where the cost of equity was left unchanged. They stated "Even though the risk-free rate has declined, TPCR4 relied on a 'total returns on equity' approach, and *it is generally accepted that total returns are more stable than the individual components*" (emphasis added). In the 2009 Electricity Distribution Review they provide evidence on equity and asset betas, and discuss the equity risk premium, saying they have considered all this evidence, but ultimately they do not provide a disaggregated cost of equity figure. The ORR in effect follows Ofgem but in a sub-analysis estimated the cost of equity by assuming beta is one (a figure close to the adjusted equity beta in the Ofgem report – see below). It justifies this approach by an Annex on relative risk in which it finds that the most appropriate comparator for the risk of the rail industry is the power industry.

60. A further common feature of the regulatory process in the UK is the use of a range of estimates in arriving at the final allowed rate of return. The asymmetry of consequences (the significant consumer detriment following a lack of investment and innovation on the one hand, against consumer price detriment on the other) is recognised, invariably leading to a point estimate of WACC towards the upper end of the range, as the consequences of under-investment are judged to be more important than those from price detriment.[33] Some debate can be found on whether the adjustment should be made to individual components or to the overall WACC, but the preference seems to be for the latter.[34]

61. I note that this general approach is consistent with that in the recent IPART-SDP Review.

[33] A typical example is from the CC's Stansted Airport price review at Appendix L, p.27, where the CC observes "..that there were asymmetric consequences from setting returns too high and too low. Specifically, there was a significant detriment to users if Stansted was deterred by inadequate financial returns from investing in new facilities which more than outweighed the costs of setting returns too high and asking users to pay higher charges than strictly necessary.

[34] See: http://www.ofwat.gov.uk/pricereview/pr09phase3/rpt_com_20091126fdcoc.pdf pp. 102-107

Common components of the cost of equity – approaches to estimation

The Risk-Free rate

62. A common feature in UK regulatory practice throughout the past five years has been an adjustment to market Gilt yields. This is actually a continuation of a long-standing practice dating back to the 1990s where index-linked gilt yields (usually the preferred base for estimation) were argued to be distorted by pension fund liquidity requirements. Currently the argument is that a mix of such pension fund activity coupled with the Bank of England's "Quantitative Easing" programme is such that market yields are not a reliable indicator of the optimal risk free rate for regulatory purposes, bearing in mind the objectives of that process and the asymmetric consequences of error in any cost of capital estimates discussed at 60 above. In the analysis below only the latest reports from each regulator are discussed, as these are most relevant to current market conditions.

63. For the water industry, Europe Economics (Ofwat's consultants) expressed some reservations about this adjustment practice, pre-QE, although ended up in a position where they still selected an RF above the then current index linked gilt yields. They opted for a point estimate of 1.75% with a range estimate of 1.5% to 2.2%.

64. The ORR-CEPA report adopts a range estimate of 1.7% to 2.35%, whilst Ofgem does not disaggregate the component elements of its cost of equity.

65. In the Stansted inquiry, the CC considered evidence from the forward rates implied by the Index-Linked Gilt (ILG) curve. This led them to move away from the 10 year ILG yield used in the Heathrow/Gatwick study and to put greater emphasis on shorter dated ILG rates. Even so, they opted for an RF of 2% despite the fact that these ILG yields were all less than 2%.

66. In the Bristol Water appeal, the CC discusses the impact of the start of the Bank of England's QE programme on ILG rates, and discusses this plus "other distortions". At the outset, CC notes Ofwat's position on RF (Appendix N, para 60) "Ofwat said that its view was also consistent with *the ten-year long-run historic UK index-linked gilts of five- and ten-year maturity* and consistent with recent regulatory determinations." (sic – this is clearly meant to refer to ten year average yields). The CC then analyses the arguments for various RF proxies at length, noting that "we continue to see merit in the argument that distortions (associated, for example, with pension fund dynamics) continue to affect longer-dated index linked yields" at Appendix N, para. 70. Noting that ILGs remain its preferred benchmark for RF it presents evidence that ILG yields were below 1% across the yield curve and also presents long run (5 year) averages. It is clear that these five year averages were all below 1.5%. It ends by looking at international evidence, bearing in mind credit risk, saying it was "unaware" of any evidence for the real RF exceeding 2%. It still concluded that the range for RF was 1% to 2%, despite ILG yields being considerably less than 1% at that time.

67. Ofcom is the only regulator to have set prices in the past two years, so its judgement on the current value of RF is particularly relevant. In the 2011 Mobile

Termination case Ofcom explicitly recognises the problems caused by QE and argue that more weight should be placed on long run averages. They adopt a slightly different approach to RF estimation compared to the CC, using Bank of England data on the implied real rate on gilts. It is worth considering the detail of this calculation. At A8.39 in this case, Ofcom observes: "The currently high levels of demand for UK gilts look unusual when viewed against long-term data, and we are cautious about attaching too much weight to current very low real rates." Then, at A8.45: "While we would generally tend to give more weight to more recent rates than averages over past years, we are mindful (as in past charge controls) that we do not wish to give too much weight to a rate based on a period of unusual market activity. Therefore we are minded at the present time to give greater weight than usual to longer term averages". In Table A8.5 they then set out a range of average real yields ranging from 1 day through 1-6 months to 1-10 years on 5 and 10 year gilts. The short run real yields range between -0.3% and 0% for the 5 year gilt and 0.5% to 0.8% for the 10 year gilts. The 10 year average yields for both are 1.7%. Whilst the weighting given to these data points is not explicit, implicitly far greater weight must be given to the 10 year average as their final estimate of the real RF is 1.5%. In the 2012 LLU/WLR determination this estimate of RF was reduced to 1.4%, but this determination is currently being appealed to the CC.

68. Note that in all the above cases the approach is consistent with some weight being placed upon past observations. Whilst the weighting scheme is never made explicit, simple calculations show that in recent cases, a weight well in excess of 50% is being placed on long run averages.

The equity risk premium (or expected return on the market)

69. There is a distinction between regulators who work directly with a market (or equity) risk premium (MRP), and those who work with an expected return on the market E(RM). In its Stansted Report, the CC sets out the case for the latter, and this recommendation is accepted by the CAA. Indeed, the CC, at Appendix L paragraph 79 of their report specifically say that they would *not* expect the Rm term in the CAPM to be affected by changes in the short term interest rate, concluding that "It would be illogical for us to have retained our previous range for the [MRP] in the absence of any reason to believe that a lower risk-free rate had translated into a lower cost of equity". More recently, this is the approach adopted in the Bristol Water appeal, where the CC emphasises the need for the RF used in setting the CAPM cost of equity to be consistent with the RF used in deriving the MRP, which, to add further emphasis, it explicitly chooses to set out as (E[RM] - RF).

70. The Bristol Water case is particularly interesting, as the CC sets out in some detail alternative approaches to estimating RM in Appendix N, where it discusses the issue of geometric v arithmetic averages, which is also discussed in Stansted, but here is taken to a new level by explicitly calculating simple return averages for various holding periods, together with the Blume (1974) and Jacquier, Kane and Marcus (2005) estimators for these holding periods. This analysis sets out the

results using both Dimson, Marsh and Staunton (DMS)[35] and Barclays Capital data.[36]

71. It then conducts an analysis of implied expected returns using what it terms the "dividend yield model" following Fama and French (2002), Vivian (2007) and Gregory (2007), and finally concludes with the forward Global MRP estimates obtained in Dimson, Marsh and Staunton (2010). Finally, it examines data for the implied return on equities produced in the Bank of England Q1 2010 report, derived using analysts' forecasts, which it notes are volatile and may suffer from bias in analysts' forecasts. It rejects the use of survey evidence in establishing the E(RM)/MRP.

72. The detailed analysis for Ofwat, in its 2009 Price Review, is found in the appended Europe Economics (EE) Report. Citing the Smithers & Co report, this also notes that the RM has been more stable historically than the MRP itself. They draw attention to the fact that this has implications given their preferred point estimate for RF.

73. As noted above, Ofgem does not disaggregate the cost of equity calculation, but in the 2009 Electricity Distribution Review say: "While we have not disaggregated our cost of equity determination, we have included an additional premium in the ERP to reflect the fact that there is perhaps greater uncertainty in the cost of equity for DPCR5 than at GDPCR". .

74. In the 2009 Openreach Price Review, Ofcom is clear that it places little weight on either forward estimates of the risk premium, or on survey evidence, both of which it regarded as "subjective". They suggested a historical estimate based largely on historical evidence from DMS. Ofcom are explicit that they put more weight on arithmetic averages, rather than geometric ones, before they finally selected a broad range. They then settled on the upper end of this range, because: "Our decision to choose a point estimate at the top of our prior range is in response to increased market volatility and turbulence, which is likely to lead to investors requiring increased returns in exchange for holding equity rather than risk-free assets." This was challenged in the appeal to the CC by Carphone Warehouse (CW), but whilst the CC expressed some sympathy with some of the arguments advanced by CW, it noted that the combined effect of the RF and implied E(RM) estimate were not out of line with CW's own estimates.

75. In the 2011 Mobile Termination charge report, Ofcom cited the Bristol Water Appeal analysis by the CC and explicitly linked its RF and MRP estimates with an implied E(RM), before comparing this to the E(RM) used by the CC in the Bristol Water case.

Comparison with the AER case

76. To summarise, a clear difference with UK regulatory practice with regard to RF is that in the AER Case there is no attempt to estimate the RF using some form of

[35] Note that throughout, DMS is used as the abbreviation of this widely-referenced source, although as it is an annual publication, the precise data cited varies between reports.
[36] Appendix N, Table 4.

historical averaging. Even in the most recent UK case (Ofcom, 2012) the base estimate of the real RF is actually 1.4%, despite the actual yield on ILGs at the time being close to zero or even negative. In the SDP case, IPART clearly recognises that there is a problem with simply using the current yield on CGS in a regulatory context. The implied real RF being used in the AER case is under 0.5%. The Brailsford et al (2012)/Handley data clearly shows that such a real Government bond rate is a long way below any historical average. Over the periods which the Brailsford et al (2012) study regards as of key importance, these *real* yields are 2.45% from the start of the series to the end of 2011, 2.70% from 1988-2011 and 3.84% from 1988 to 2011. The AER's chosen *nominal* rate is below the minimum of any point in the 1958-2011series, which fell to a low point of 3.67% in 2011. Excluding that year, the previous lowest yield figure was 4%. Given current conditions would appear to be wholly exceptional, it is reasonable to at least consider recent UK regulatory precedent when estimating RF in Australia, and indeed there is an Australian precedent (in the IPART-SDP case) for doing so. Clearly, making any allowance for the unusual conditions in global government bond markets would have the effect of raising the underlying risk free rate estimate.

77. The major difference between most UK regulators and the AER is that with the exception of Ofcom, the discussion on CAPM parameters generally focuses on the E(RM) rather than the MRP. This is at its most explicit in the CC reports, both in its regulatory role with respect to airports, and in its role as a regulatory appeals body, but it is also explicit in the last Ofwat price review. Ofgem prefers to focus directly on the allowed return, and does not decompose the judgement into its CAPM parameters. Only Ofcom forms its estimates in terms of an RF and an MRP, but even then discusses the implied E(RM).

Concluding Comments

78. Theory suggests that the individual components of the CAPM should be estimated directly. These are RF and E(RM), not RF and MRP.

79. Importantly, there is evidence, discussed at 16-17 above, that E(RM) has a stable mean. By contrast, it appears that neither RF nor the MRP have stable means. Of course, there is considerable debate in the academic literature concerning stability, as is evidenced by the differences of opinion expressed in the 2008 special issue of the Review of Financial Studies, where Cochrane (2008) and Campbell and Thompson (2008) taking opposing positions to Goyal and Welch (2008). Critically, though, note that when these authors discuss the "market risk premium" it is specifically in the context of the premium over Treasury Bill rates *not* the risk premium over bonds. The stability of the MRP relative to bond yields has not been analysed in these papers.

80. If the E(RM) has a more stable mean, the consequence is that direct estimates of E(RM) are likely to be more statistically reliable than indirect estimates formed by summing RF and MRP. This may be of particular importance in the present environment of exceptionally low levels of RF.

81. Thus the clear recommendation by prominent UK academics in reports commissioned specifically for UK regulators (The Smithers Report and the follow-up 2006 Smithers & Co Report) is that the CAPM should be implemented by directly estimating the E(RM) and RF components, and specifically *not* by the common practice of indirect estimation using an RF and MRP. It must also be noted that the asymmetry of consequences that flow from mis-estimating the cost of capital highlight the particular danger of under-estimating the cost of equity by that the MRP remains stable in the presence of unusually low CGS yields.

82. It is clear that the UK regulators, and in particular the appeals body, the UK Competition Commission, have heeded this advice.

83. Furthermore, it is clear that within Australia IPART have similarly recognised this issue.

84. Applied to the case of the recent AER judgement, this advice would have a material impact as the direct estimate of the E(RM) and RF components would have resulted in a higher implicit market risk premium. This would be the case whether either historical mean returns had been used to estimate E(RM), or a DGM estimate was used, or some weighting of a combination of these estimates was employed.

85. If one allows for the contentious debate concerning returns predictability and its meaning, an alternative line of reasoning is that historical means may be an efficient predictor of future returns (see, for example, Goyal and Welch, 2008).

86. Following this line of reasoning, the regulator could have used long term averages of both RF and RM components to set the discount rate. As is set out above, recent UK cases have acknowledged the particular difficulty in estimating an RF in current market conditions, as has IPART. As is discussed at 52 and 53 above, it is difficult to be prescriptive about which long run averages should be used in such an approach, but if one chooses an MRP of 6% based largely on historical evidence, it is important to give equal weight to the historical evidence on the RF component.

87. Whether one adopts a pure forward looking approach to estimating the CAPM components (i.e. a direct forward estimate of E(RM) combined with a spot RF), or an approach that uses historical evidence to determine an RF and an MRP, the effect would be to raise the allowed rate of return significantly.

88. It seems clear that the AER's approach has resulted in a likely significant under-estimate of the cost of capital in the case of the Gas Businesses. UK regulatory authorities have explicitly recognised that the consequences of an under-estimation of the cost of capital will be under-investment in infrastructure, which implies a long term consumer detriment.

89. It is clear that this recognition of possible consumer detriment is a feature of Australian gas regulation. The Objective of the National Gas Law states "The objective of this Law is to promote efficient investment in, and efficient operation and use of, natural gas services for the long term interests of consumers of natural gas with respect to price, quality, safety, reliability and security of supply of natural

gas." My view is that, in contrast to the positions adopted by UK regulators and by IPART, the AER has not considered the full implications of its proposed cost of capital for the long term interests of consumers.

Statement by Alan Gregory

I am Professor of Corporate Finance at the Xfi Centre (Centre for Finance and Investment) at the University of Exeter, and a former Director of the Centre. I was a reporting panel member of the UK Competition Commission from 2001-2009, and am currently an External Advisor to the UK Competition Commission's Finance and Regulation Group. A summary CV is attached setting out my qualifications and publications.

I confirm that I have made all the inquiries that I believe are desirable and appropriate and that no matters of significance that I regard as relevant have, to my knowledge, been withheld from the report.

Signed:

Alan Gregory 5th November 2012

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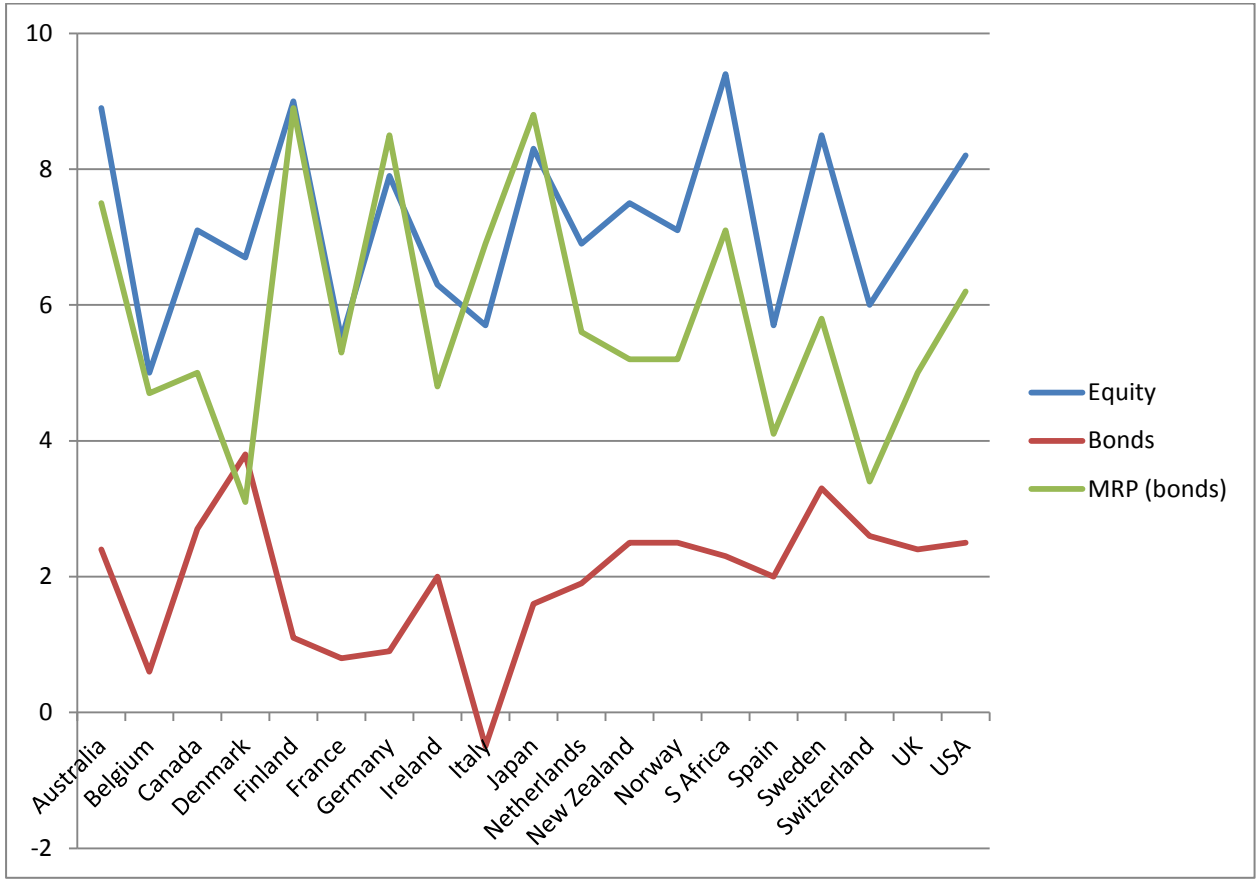
Figure 1: International real returns on equity, government bonds, and the market risk premium, 1900-2011.



Data are from Dimson, Marsh and Staunton (2012) Tables 2, 5 and 10. "Equity" shows the arithmetic mean real return on equities for each country "Bonds" shows the arithmetic real return on government bonds for each country, and "MRP (bonds)" shows the arithmetic mean real market risk premium for equities compared to bonds for each country.

Appendix: Explanation of the Historical Expected Risk Premium Using the Dividend Growth Model

The approach used to model historically expected risk premium is conceptually extremely simple, and relies on the fact that in rational markets, the price of any equity must be the present value of the future dividend stream. Two common approaches to the problem are the Fama and French (2002) model, and the Dimson et al (2007) model.

The Fama and French 2002 Model

The model is developed in Fama and French (2002, hereafter FF) and has also been applied in Vivian (2007) to the UK market. The interest is in the expected return, $E(R_m)$, on a market-wide portfolio, so expressing the standard dividend growth model in terms of returns rather than prices, and assuming constant real growth in perpetuity, expected returns are given by:

$$E_t(R_m) = \frac{E_t(D_{t+1})}{P_t} + E_t(g_t) \qquad \text{(A1)}$$

where D_{t+1} is the real dividend one period hence, and g_t is the long run real growth in prices. The first term on the right hand side of (A1) is the expected dividend yield on the market. Provided the real dividend yield is stationary, long run real price growth will be equivalent to the long run real growth in dividends. As in FF, the assumption is that real dividend growth (GD_t) is simply a function of the most recent period's real dividend growth, where real dividends are defined by $d_t.(CPI_{t-1}/CPI_t)$, CPI_t is the level of the consumer price index at time t, d_t is the nominal dividend at time t, and $GD_t = (d_t/d_{t-1}).(CPI_{t-1}/CPI_t)$. Given this simplifying assumption concerning dividend growth, we can estimate the historical series of expectations as:

$$\overline{R}_{m,t} = \frac{\overline{D}_t}{P_{t-1}} + \overline{G}D_t \qquad \text{(A2)}$$

Alternative specifications are possible. For example, Dimson et al (2002) use the full historical run of data in any year to give an estimate of expected growth, although their approach has the different objective of calculating unexpected dividend growth. Alternatively, one can use earnings growth as is also done in FF. Here, I limit the analysis to dividend growth given earnings growth numbers are not available in the Brailsford et al (2011)/Handley data sets.

FF view the (A2) estimate as the unconditional mean estimate and discuss the adjustment to such an estimate needed to arrive at a simple annual rate for discounting purposes. An unconditional estimate will usually imply a short run change in market prices so that the dividend yield reverts to its long run mean value. As FF show, the estimation of an expected annual simple return requires that the estimates formed from the mean dividend growth model of expected returns are uplifted by half the difference between the variance of the price growth series and the variance of the dividend growth (or earnings growth) model returns.[37]

[37] If one believes that it is the risk premium that is stationary, then as these are historical estimates, the appropriate risk free rate would be the historical real yield on CGRs.

Using the Brailsford et al (2011) data set, suitably updated, the real *E(Rm)* estimate for the period 1958-2011 is 7.63% assuming γ=0.25. As the standard deviation of the real dividend growth is 18.39% over this period, and that of the price growth series is 20.95%, the bias adjustment is 0.50% resulting in a mean expected simple *real E(Rm)* of 8.14%.[38]

The Dimson et al (2007) model

This model takes a slightly different approach to FF, Their approach uses a logarithmic decomposition of the historical risk premium does not allow for any imputation tax credit value, and uses a log decomposition approach to analyse historically realised returns. The theory behind such a decomposition is that some elements of historical return can be attributed to revision in expectations or higher than expected realisations in firm cash flows. By considering only the mean dividend yield and the historically achieved growth, it is possible to estimate what future returns on the market would be assuming mean reversion in these parameters.[39]

In the 2012 Yearbook DMS provide updated estimates of the decomposition of the historical risk premium.[40] Australia appears to be rather different from global averages, and has a higher than average geometric mean dividend yield (5.75%) and higher than average compound growth in the dividend yield (0.99%). Summing these two components gives the implied *geometric* mean real historically expected return of 6.74%. Dimson et al (2007) explain that the uplift required to convert this expected geometric return to an arithmetic one is 1% to 1.5%, from which we might infer that the real expected long run arithmetic mean return would be around 7.74% to 8.24%. Applying the usual Fisher relationships to get the implied nominal E(RM) we have a nominal expected return of 10.43% to 10.95%. At the AER's preferred risk-free rate of 2.98%, this equates to an expected MRP of 7.45% to 7.97%.

[38] 7.72% % if γ=0, i.e. if tax credits have zero value.
[39] See Dimson, Marsh and Staunton (2007)
[40] Dimson, Marsh and Staunton (2012) Credit Suisse Global Investment Returns Sourcebook (Table 11, p.31)

Summary CURRICULUM VITAE for Alan GREGORY

CURRENT POSITION: Chair in Corporate Finance, and Director, Xfi Centre for Finance and Investment, University of Exeter Business School

DATE OF BIRTH: 19.3.1954

PLACE OF BIRTH: Mountain Ash, Wales

ACADEMIC AND PROFESSIONAL QUALIFICATIONS:

MSc in Accounting and Finance (London School of Economics and Political Science, 1983)

Fellow of the Chartered Institute of Management Accountants (CIMA) (qualified in 1974); elected to associate membership 1978; elected to Fellowship 1986)

Certificate in Education (1978).

BACKGROUND:

Alan is Professor of Corporate Finance at the University of Exeter. His research interests are in the general area of market-based empirical research. This interest includes risk pricing, together with returns to, and valuation of, corporate social responsibility agenda. Related work has focused on market reaction to directors' trading activity, the success of initial public offerings, and returns following mergers and acquisitions.

From September 2001 to September 2009 he was a Reporting Panel Member of the UK Competition Commission where he was involved in a number of inquiries, including the two potential European takeover bids for the London Stock Exchange, and most recently the Groceries or "supermarkets" inquiry.

His consulting interests have covered investment portfolio analysis, company valuation and cost of capital, particularly for regulatory purposes, and includes expert witness work. His past clients include fund managers, stockbrokers, large accounting firms, HM Treasury, Ofcom, and the Competition Commission. He is currently External Advisor to the UK Competition Commission's Finance and Regulation Group.

PUBLICATIONS:

Refereed journal articles since 2000:

'Constructing and Testing Alternative Versions of the Fama-French and Carhart Models in the UK' (with Rajesh Tharyan and Angela Christidis) – forthcoming, *Journal of Business Finance and Accounting*

'Exploring the Valuation of Corporate Social Responsibility—A Comparison of Research Methods' (with Julie Whittaker) – forthcoming in *Journal of Business Ethics.*

'Gender Diversity on Corporate Boards: What Can We Learn from Market Reaction to Insider Trades' (with Emma Jeanes, Rajesh Thrayan and Ian Tonks) – forthcoming in *British Journal of Management.*

‘More Than Just Contrarians: Insider Trading in Glamour and Value Firms’ (with Rajesh Tharyan and Ian Tonks) – forthcoming, *European Financial Management*

‘Expected Cost of Equity and the Expected Risk Premium in the UK’. *Review of Behavioral Finance*, 3(1), pp. 1-26, June 2011

‘Stock Market Driven Acquisitions versus The Q Theory of Takeovers – The UK Evidence’ (with X. Bi) *Journal of Business Finance and Accounting* 38, 5 & 6, pp 628-656 (July 2011)

‘UK IPOs: Long Run Returns, Behavioural Timing and Pseudo Timing’ (with C. Guermat and F. Al-Shawraweh), *Journal of Business Finance and Accounting* June/July 2010, 37(5-6), pp 612–647.

‘Industry Cost of Capital: UK Evidence’, (A.Gregory and M. Michou), *Journal of Business Finance and Accounting,* June/July 2009, pp 679–704.

‘Performance and Performance Persistence of Ethical Unit Trusts in the UK’ (A.Gregory and J.Whittaker), *Journal of Business Finance and Accounting,* Sept/Oct 2007, pp 1327-1344.

‘The Long Run Abnormal Performance of UK Acquirers and the Free Cash Flow Hypothesis’, (A. Gregory), *Journal of Business Finance and Accounting,* June 2005, pp. 777-814.

‘A UK Test of an Inflation-Adjusted Ohlson Model’, (A.Gregory, W.Saleh and J.P.Tucker), *Journal of Business Finance and Accounting,* April/May 2005, pp 487-534.

‘Foreign Acquisition by UK Limited Companies: Short and Long-Run Performance’ (Alan Gregory and Steve McCorriston), *Journal of Empirical Finance*, 12, 2005, pp 99-125.

‘Contrarian Investment and Macroeconomic Risk in the UK’ (Alan Gregory, Richard Harris and Maria Michou). *Journal of Business Finance and Accounting,* Jan/March, 2003, pp 213-255.

‘Short-Run Returns around the Trades of Corporate Insiders on the London Stock Exchange’ (S. Friederich, A. Gregory, J. Matatko and I. Tonks). *European Financial Management,* March 2002, pp.7-31.

‘An Analysis of Contrarian Investment Strategies in the UK’ (Alan Gregory, Richard Harris and Maria Michou). *Journal of Business Finance and Accounting,* December 2001, pp 1193-1228.

‘*Discussion of* Acquisition-Related Provision-Taking and Post-Acquisition Performance in the UK Prior to FRS7’ (A. Gregory), *Journal of Business Finance and Accounting*, (November / December 2000)

‘Testing the Robustness of Long-Term Under-performance of UK Initial Public Offerings’ (S. Espenlaub, A. Gregory and I. Tonks), *European Financial Management*, September 2000.

‘Motives underlying the method of payment by UK acquirers: the influence of goodwill’ (A. Gregory), *Accounting & Business Research*, Summer (2000)

Research Grants obtained since 2000:

£284,355 from ESRC for "Cost of Capital and Asset Pricing in the UK" (as Principal Investogator; joint with Christina Dargenidou, Rajesh Tharyan and Penguo Wang). 2012-2015.

£25,000 from ICAEW for £25,000 for "The valuation and long run returns of firms with positive corporate social responsibility (CSR) indicators" (as Principal Investigaor; with Julie Whittaker) 2011-13.

£78,000 from Leverhulme to investigate directors' trading patterns around takeover announcements (2008-2010, I was lead applicant – the bid was joint with Ian Tonks).

EXTERNAL AND PROFESSIONAL LINKS:

1. Appointed to REF Panel 19 as assessor for 2009-2014REF.
2. Member of the Competition Commission (2001-2009). External Advisor to the UK Competition Commission's Finance and Regulation Group, September 2009-date.
3. OECD Round Table panellist on Excessive Pricing and Role of Profitability Testing, October 2011.
4. Member of the Editorial Board of *Journal of Business Finance and Accounting.*
5. Member of the Editorial Board of *Accounting and Business Research.*
6. Director, Exeter Enterprises Ltd (the University of Exeter consulting arm) until August 2007.
7. Former member of CIMA's Management and Professional Development Committee, now CIMA Enterprises Advisory Board.
8. Former consultant to Her Majesty's Treasury on the Government Profit Formula for non-competitive contracts
9. Former consultant to various accounting firms and fund management companies on areas related to cost of capital, risk and return, and equity portfolio construction.
10. External assessor on chair appointments at Edinburgh and Stirling Universities.
11. External examiner on numerous PhDs including Cass, University of Cambridge, Lancaster Management School, Reading University and Manchester Business School.
12. Assessor on a number of AMBA accreditation panels.

PREVIOUS EMPLOYMENT:

Jan. 1996 - Sept 97: Professor of Business Studies, University of Wales, Aberystwyth.

Sept. 1995- Dec. 96: Professor of Accounting, University of Glasgow

Sept. 1989-Sept. 95: Lecturer in Accounting and Finance, University of Exeter.

Sept. 1986-Aug. 89: Principal Lecturer in Accounting and Finance, City of London Polytechnic.

Sept. 1983-Aug. 86: Senior Lecturer in Accounting, Brighton Polytechnic.

Apr. 1978-Aug. 83: Senior Lecturer in Accounting, Luton College of Higher Education.

Sept. 1977-March 78:	Lecturer II, South West London College.
Jan 1977-Aug. 77:	Budgets Controller, Green Shield Stamps.
Jan 1976-Dec. 76:	Manager, Western Region Settlement Accounts Section.
Aug. 1974-Jan 76:	Assistant Development Accountant, British Rail Western Region.
Aug. 1971-Aug. 74:	Management Trainee, British Rail

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25 October 2012

Mr Alan Gregory
Professor of Corporate Finance
Xfi Centre for Finance and Investment
University of Exeter Business School

Dear Sir

Victorian Gas Access Arrangement Review 2013-2017: Envestra, Multinet SP AusNet and APA GasNet

We act for Envestra Limited (**Envestra**), Multinet Gas (DB No. 1) Pty Ltd and Multinet Gas (DB No. 2) Pty Ltd (together, **Multinet**) and SPI Networks (Gas) Pty Ltd (**SP AusNet**) in relation to the Australian Energy Regulator's (**AER**) review of the Gas Access Arrangements for Victoria.

Envestra, Multinet and SP AusNet (**the Distributors**) as well as APA GasNet (Australia) Operations Pty Ltd (**APA GasNet**) (together the **Gas Businesses**) wish to jointly engage you to prepare an expert report in connection with the AER's review of the Victorian Gas Access Arrangements. The report will also be used by Envestra for the AER's review of Envestra's Access Arrangement for its Albury Distribution Network.

This letter sets out the matters which the Gas Businesses wish you to address in your report and the requirements with which the report must comply.

Terms of Reference

The terms and conditions upon which each of the Gas Businesses provides access to their respective networks are subject to five yearly reviews by the AER.

The AER undertakes that review by considering the terms and conditions proposed by each of the Gas Businesses against criteria set out in the *National Gas Law* and *National Gas Rules*.

Rule 76 of the *National Gas Rules* provides that the Gas Businesses' total revenue for each regulatory year is to be determined using the building block approach, in which one of the building blocks is a return on the projected capital base for the year.

Rule 87(1) provides that the rate of return on capital is to be commensurate with prevailing conditions in the market for funds and the risks involved in providing reference services. Rule 87(2) provides that a well accepted approach incorporating the cost of equity and debt (such as the Weighted Average Cost of Capital (**WACC**)) is to be used along with a well accepted financial model (such as the Capital Asset Pricing Model (**CAPM**)) in determining the rate of return on capital.

The Gas Businesses are seeking expert assistance in respect of their proposed estimates of the cost of equity to be used in the calculation of the WACC (through the CAPM) and the approach of the AER in recent decisions and in the Gas Access Arrangement Review Draft decisions for the Distributors and APA GasNet.

In this context the Gas Businesses wish to engage you to prepare an expert report which considers the following issues arising from the AER's recent decision in the Roma to Brisbane Pipeline Final Decision and the Draft Decisions for the Distributors and APA GasNet:

(a) Is the AER's approach to estimating the cost of equity in these decisions consistent with the approach adopted by the UK regulator, Ofgem and UK appeals body, the Competition Commission?

(b) In light of the UK regulatory approach, is the AER's approach to estimating the cost of equity for the Distributors and APA GasNet likely to result in a rate of return that satisfies the requirements of Rule 87(1) of the National Gas Rules that:

The rate of return on capital is to be commensurate with prevailing conditions in the market for funds and the risks involved in providing reference services.

(c) In light of the recent Tribunal findings on the cost of capital, the recent IPART Review of water prices for the Sydney Desalination Plant Pty Ltd, and the implications of UK regulatory practice for Australia, how might the Gas Businesses best estimate the cost of equity in order to satisfy the requirements of 87(1) and 87(2) of the National Gas Rules?

In answering these questions, please explain the extent to which the UK regulatory approach, including the regulator's objectives, are likely to be relevant in Australia.

Use of Report

It is intended that your report will be included by each of the Gas Businesses in their respective responses to the AER's Draft Decisions in respect of their access arrangement revision proposals for their Victorian networks (and in the case of Envestra, Albury network) for the access arrangement period from 1 January 2013 to 31 December 2017. The report may be provided by the AER to its own advisers. The report must be expressed so that it may be relied upon both by the Gas Businesses and by the AER.

The AER may ask queries in respect of the report and you will be required to assist each of the Gas Businesses in answering these queries. The report will be reviewed by the Gas Businesses' legal advisers and will be used by them to provide legal advice to the Gas Businesses as to their respective rights and obligations under the *National Gas Law* and *National Gas Rules*.

If any of the Gas Businesses choose to challenge any decision made by the AER, that appeal will be made to the Australian Competition Tribunal and the report will be considered by the Tribunal. The Gas Businesses may also seek review by a court and the report would be subject to consideration by such court. You should therefore be conscious that the report may be used in the resolution of a dispute between the AER and any or all of the Gas Businesses as to the appropriate level of the respective Distributor's distribution tariffs. Due to this, the report will need to comply with the Federal Court requirements for expert reports, which are outlined below.

Compliance with the Code of Conduct for Expert Witnesses

Attached is a copy of the Federal Court's Practice Note CM 7, entitled "*Expert Witnesses in Proceedings in the Federal Court of Australia*", which comprises the guidelines for expert witnesses in the Federal Court of Australia (**Expert Witness Guidelines**).

Please read and familiarise yourself with the Expert Witness Guidelines and comply with them at all times in the course of your engagement by the Gas Businesses.

In particular, your report prepared for the Gas Businesses should contain a statement at the beginning of the report to the effect that the author of the report has read, understood and complied with the Expert Witness Guidelines.

Your report must also:

1 contain particulars of the training, study or experience by which the expert has acquired specialised knowledge;

2 identify the questions that the expert has been asked to address;

3 set out separately each of the factual findings or assumptions on which the expert's opinion is based;

4 set out each of the expert's opinions separately from the factual findings or assumptions;

5 set out the reasons for each of the expert's opinions; and

6 otherwise comply with the Expert Witness Guidelines.

The expert is also required to state that each of the expert's opinions is wholly or substantially based on the expert's specialised knowledge.

It is also a requirement that the report be signed by the expert and include a declaration that "*[the expert] has made all the inquiries that [the expert] believes are desirable and appropriate and that no matters of significance that [the expert] regards as relevant have, to [the expert's] knowledge, been withheld from the report*".

Please also attach a copy of these terms of reference to the report.

Terms of Engagement

Your contract for the provision of the report will be directly with the Gas Businesses. You should forward to each of the Gas Businesses any terms you propose govern that contract as well as your fee proposal.

Please sign a counterpart of this letter and forward it to each of the Gas Businesses to confirm your acceptance of the engagement by the Gas Businesses.

Yours faithfully

Johnson Winter & Slattery

Enc: Federal Court of Australia Practice Note CM 7, "Expert Witnesses in Proceedings in the Federal Court of Australia"

……
Signed and acknowledged by Professor Alan Gregory

Date ……..

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February 2012

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Elroy Dimson · Paul Marsh · Mike Staunton

Credit Suisse Global Investment Returns Sourcebook 2012

Table 9: Worldwide equity risk premiums relative to bills, 1900–2011

Country	Geometric mean%	Arithmetic mean%	Standard error%	Standard dev.%	Minimum return%	Min year	Maximum return%	Max year
Australia	6.5	8.0	1.7	17.7	-44.4	2008	49.2	1983
Belgium	2.8	5.4	2.3	24.6	-57.8	2008	130.4	1940
Canada	4.1	5.5	1.6	17.1	-34.7	2008	49.1	1933
Denmark	2.6	4.4	1.9	20.5	-50.3	2008	95.3	1983
Finland	5.5	9.2	2.9	30.3	-53.3	2008	159.2	1999
France	5.9	8.5	2.3	24.5	-43.1	2008	85.7	1941
Germany*	5.7	9.6	3.0	31.8	-44.7	2008	131.4	1949
Ireland	3.0	5.3	2.0	21.4	-66.3	2008	72.0	1977
Italy	5.5	9.5	3.0	32.0	-48.6	1945	150.3	1946
Japan	5.6	8.8	2.6	27.7	-48.3	1920	108.6	1952
The Netherlands	4.1	6.4	2.2	22.8	-51.4	2008	126.7	1940
New Zealand	4.0	5.6	1.7	18.3	-58.3	1987	97.3	1983
Norway	2.9	5.7	2.5	26.4	-55.0	2008	157.1	1979
South Africa	6.2	8.2	2.1	22.0	-33.9	1920	106.2	1933
Spain	3.1	5.3	2.1	21.8	-39.3	2008	98.1	1986
Sweden	4.2	6.5	2.1	22.1	-40.8	2008	84.6	1905
Switzerland	3.3	5.0	1.8	18.9	-37.0	1974	54.8	1985
United Kingdom	4.2	5.9	1.9	19.9	-54.6	1974	121.8	1975
United States	5.2	7.2	1.9	19.7	-44.1	1931	56.6	1933
Europe	3.6	5.7	2.0	20.9	-47.1	2008	76.3	1933
World ex-USA	3.9	5.7	1.9	19.9	-44.0	2008	79.6	1933
World	4.4	5.8	1.6	17.1	-41.2	2008	70.3	1933

* For Germany, statistics are based on 110 years, excluding 1922–23. Source: Elroy Dimson, Paul Marsh, and Mike Staunton, Triumph of the Optimists, Princeton University Press, 2002, and subsequent research.

Table 10: Worldwide risk premiums relative to bonds, 1900–2011

Country	Geometric mean%	Arithmetic mean%	Standard error%	Standard dev.%	Minimum return%	Min year	Maximum return%	Max year
Australia	5.6	7.5	1.9	19.9	-52.9	2008	66.3	1980
Belgium	2.5	4.7	2.0	21.4	-60.3	2008	84.4	1940
Canada	3.4	5.0	1.7	18.4	-40.7	2008	48.6	1950
Denmark	1.6	3.1	1.7	17.5	-54.3	2008	74.9	1972
Finland	5.2	8.9	2.9	30.4	-56.3	2008	173.1	1999
France	3.0	5.3	2.2	22.9	-49.2	2008	84.3	1946
Germany*	5.1	8.5	2.7	28.5	-50.8	2008	116.6	1949
Ireland	2.8	4.8	1.9	19.8	-66.6	2008	83.2	1972
Italy	3.5	6.9	2.8	29.6	-49.0	2008	152.2	1946
Japan	4.7	8.8	3.1	32.8	-45.2	2008	193.0	1948
The Netherlands	3.3	5.6	2.1	22.3	-55.6	2008	107.6	1940
New Zealand	3.6	5.2	1.7	18.2	-59.7	1987	72.7	1983
Norway	2.2	5.2	2.6	28.0	-57.8	2008	192.1	1979
South Africa	5.3	7.1	1.8	19.6	-34.3	2008	70.9	1979
Spain	2.1	4.1	2.0	20.8	-42.7	2008	69.1	1986
Sweden	3.5	5.8	2.1	22.4	-48.1	2008	87.5	1905
Switzerland	1.9	3.4	1.7	17.6	-40.6	2008	52.2	1985
United Kingdom	3.6	5.0	1.6	17.2	-38.4	2008	80.8	1975
United States	4.1	6.2	1.9	20.5	-50.1	2008	57.2	1933
Europe	3.7	5.0	1.6	16.7	-47.4	2008	67.9	1923
World ex-USA	3.5	4.7	1.5	15.6	-47.1	2008	51.7	1923
World	3.5	4.8	1.5	15.6	-47.9	2008	38.3	1954

* For Germany, statistics are based on 110 years, excluding 1922–23. Source: Elroy Dimson, Paul Marsh, and Mike Staunton, Triumph of the Optimists, Princeton University Press, 2002, and subsequent research.

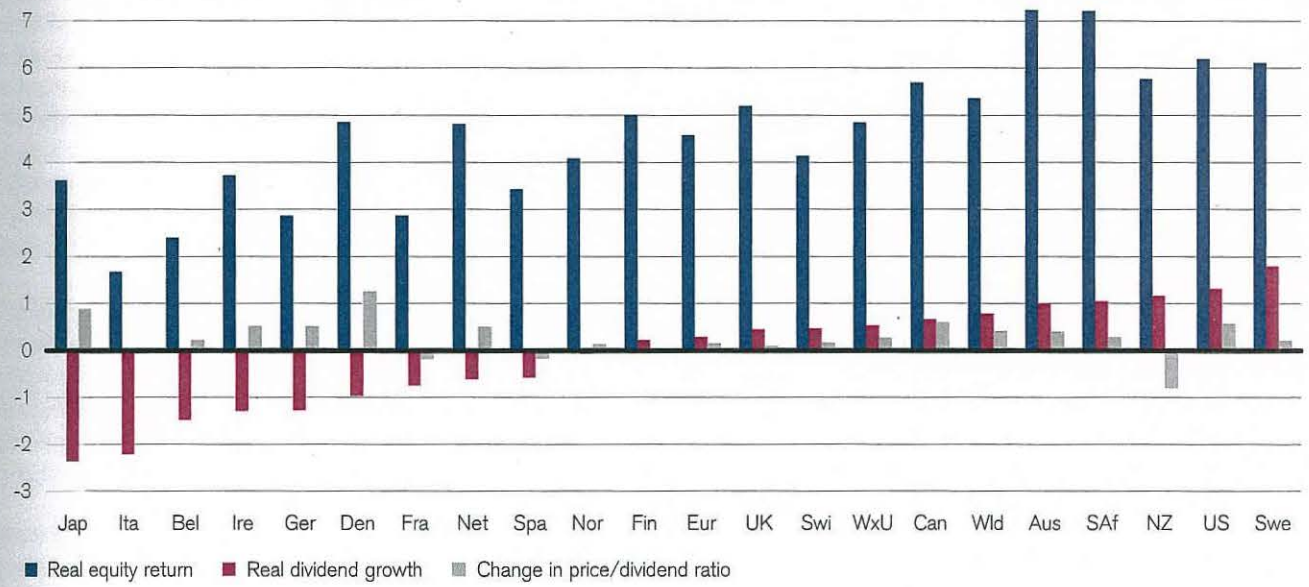
Table 11: Decomposition of the historical risk premium, 1900–2011 (% p.a.)

Country	Geometric mean dividend yield	plus* Growth rate of real dividends	plus Expansion in the P/D ratio	plus Change in the real exchange rate	minus US real interest rate	equals Equity premium for US investors
Australia	5.75	0.99	0.40	0.10	0.92	6.35
Belgium	3.71	-1.48	0.21	0.67	0.92	2.14
Canada	4.37	0.67	0.59	0.06	0.92	4.78
Denmark	4.56	-0.96	1.26	0.53	0.92	4.45
Finland	4.76	0.23	0.01	0.12	0.92	4.17
France	3.83	-0.75	-0.18	-0.08	0.92	1.85
Germany**	3.66	-1.27	0.51	0.27	0.92	2.20
Ireland	4.54	-1.29	0.51	0.28	0.92	3.06
Italy	4.05	-2.21	-0.07	0.17	0.92	0.92
Japan	5.20	-2.36	0.88	0.55	0.92	3.23
The Netherlands	4.93	-0.61	0.50	0.31	0.92	4.17
New Zealand	5.38	1.17	-0.79	-0.21	0.92	4.57
Norway	4.02	-0.07	0.13	0.33	0.92	3.47
South Africa	5.79	1.05	0.29	-0.75	0.92	5.43
Spain	4.20	-0.58	-0.17	0.09	0.92	2.57
Sweden	4.02	1.80	0.21	0.06	0.92	5.20
Switzerland	3.47	0.47	0.17	0.90	0.92	4.10
United Kingdom	4.62	0.45	0.10	-0.05	0.92	4.18
United States	4.22	1.31	0.57	0.00	0.92	5.22
Average	4.48	-0.18	0.27	0.18	0.92	3.79
Standard deviation	0.68	1.22	0.44	0.36	0.00	1.41
World (USD)	4.10	0.79	0.41	0.00	0.92	4.39

* Premiums are relative to bills. Summations and subtractions are geometric. ** For Germany, statistics are based on 110 years, excluding 1922–23. Source: Elroy Dimson, Paul Marsh, and Mike Staunton, The Worldwide Equity Premium: A Smaller Puzzle, in R. Mehra (Ed.), Handbook of the Equity Risk Premium, Elsevier, 2008.

Growth rates varied a lot across countries, ranging from 1.8% in Sweden to –2.4% in Japan. Real dividend growth was lower in the turbulent first half of the last century, when real dividends generally declined, and the real dividend growth rate on the world index was –0.9% per year. From 1900 to 1949, only three countries had positive real dividend growth, the USA, Australia, and New Zealand. But from 1950 to 2011 real dividend growth was positive everywhere except New Zealand. The real dividends on the world index grew by a far healthier 2.2% per year.

Chart 12: Real dividend growth around the world, 1900–2011



Source: Elroy Dimson, Paul Marsh, and Mike Staunton, Triumph of the Optimists, Princeton University Press, 2002, and subsequent research.

One view often expressed is that there is no particular reason to expect a bond maturity premium, since some investors will view short bonds as riskier than long bonds, while others will take the opposite view, depending on the profile of their liabilities. Bondholders with long-term horizons seeking to match long-term liabilities will view long bonds as the lower risk, since if they invest in short-term bills, they will need to reinvest on a regular basis, and there is uncertainty over the reinvestment rate. In contrast, investors with shorter-term horizons and liabilities will view long bonds as the more risky since there is uncertainty about the price at which they will be able to sell the bonds.

While these arguments are valid, they fail to take account of inflation uncertainty. We have seen that inflation has seriously affected long run investment performance, and that investors should be concerned with the purchasing power of their future wealth. At times of inflation uncertainty, short-term bonds become the lower risk investment even for investors with long-term (real) liabilities. A bond maturity premium is therefore required in order to compensate investors for the greater volatility and inflation risk of investing in long bonds. This is borne out by two key observations. First, the yield curve has historically on average been upward sloping; that is, long bonds have typically offered a higher yield to redemption than shorter dated bonds and bills. Second, real bond returns are far more volatile than real bill returns (compare Tables 4 and 5).

As was the case with the equity risk premium, we cannot easily measure investors' ex ante requirements or expectations relating to the maturity premium, but we can measure the bond maturity premiums actually achieved. Table 12 shows bond maturity premiums computed over the entire period from 1900 to 2011 for all 19 our indexes. The formula for the bond maturity premium is 1 + Long bond rate of return, divided by 1 + Treasury bill rate of return, minus 1. The second column of the table shows the geometric mean premiums that investors have earned. Chart 16 shows the same data pictorially, with the blue bars representing the geometric mean premiums. It shows that over the last 112 years, the bond maturity premium has been positive in every country (the premium for Germany excludes 1922–23).

The premium for the European index is zero as it is measured from the perspective of a US investor, relative to US bills, i.e. US holders would have been as well off holding US bills as

Table 12: Worldwide bond maturity premiums, 1900–2011

Country	Geometric mean%	Arithmetic mean%	Standard error%	Standard dev.%	Minimum return%	Min year	Maximum return%	Max year
Australia	0.9	1.4	1.0	10.4	-23.3	1973	48.2	1932
Belgium	0.3	0.7	0.9	9.2	-19.6	1914	34.0	1958
Canada	0.7	1.0	0.8	8.3	-26.4	1915	24.1	1982
Denmark	1.0	1.3	0.8	8.8	-18.5	1994	41.1	1983
Finland	0.3	0.5	0.5	5.3	-17.4	1920	19.2	1993
France	2.8	3.1	0.7	7.8	-18.7	1994	23.4	1927
Germany*	0.6	1.1	1.0	10.1	-38.6	1948	48.3	1921
Ireland	0.3	0.9	1.1	11.4	-26.4	1974	37.2	1932
Italy	2.0	2.3	0.8	8.2	-17.5	1935	52.3	1944
Japan	0.9	1.8	1.3	13.6	-45.6	1953	63.0	1954
The Netherlands	0.9	1.1	0.7	7.4	-18.9	1939	25.2	1982
New Zealand	0.5	0.7	0.6	6.7	-25.2	1984	24.4	1991
Norway	0.6	1.0	0.8	8.3	-30.4	1918	37.3	1940
South Africa	0.8	1.1	0.7	7.7	-18.3	1994	30.4	1933
Spain	1.0	1.4	0.9	9.3	-27.0	1920	46.5	1942
Sweden	0.7	1.0	0.8	8.3	-34.1	1939	24.5	1934
Switzerland	1.4	1.5	0.6	5.9	-13.9	1989	24.1	1922
United Kingdom	0.5	1.1	1.0	10.8	-26.6	1974	36.6	1932
United States	1.1	1.4	0.8	8.6	-15.0	2009	28.2	2011
Europe	0.0	0.9	1.3	13.8	-40.2	1919	66.0	1933
World ex-USA	0.3	1.1	1.2	12.8	-36.4	1919	64.3	1933
World	0.8	1.2	0.8	8.5	-20.4	1920	29.4	1933

* For Germany, statistics are based on 110 years, excluding 1922–23. Source: Elroy Dimson, Paul Marsh, and Mike Staunton, Triumph of the Optimists, Princeton University Press, 2002, and subsequent research.

CHAPTER 5

Australia

The data for equities were provided by the author of Officer (1989). He uses Lamberton's (1958a,b) data, linked over the period 1958–74 to an accumulation index of 50 shares from the Australian Graduate School of Management (AGSM) and over 1975–79 to the AGSM value-weighted accumulation index. Subsequently, we use the Australia All-Ordinary index. Brailsford, Handley and Maheswaran (2008) argue that pre-1958 dividends are overstated by Lamberton, but do not present alternative annual dividend estimates, and we continue to use Officer's dataset.

Bond returns are based on the yields on New South Wales government securities from 1900–14. For the period 1915–49, the yields were on Commonwealth Government Securities of at least five years maturity. During 1950–86, the basis is 10-year Commonwealth Government Bonds. From 1986, we use the JP Morgan Australian government bond index with maturity of over seven years.

For 1900–28, the short-term rate of interest is taken as the three-month time deposit rate. From 1929 onward, we use the treasury bill rate.

Inflation is based on the retail price index over 1900–48 and thereafter on the consumer price index.

The switch in 1966 from Australian pounds to Australian dollars has been incorporated in the Exchange Rate index history.

Table 13: **Returns on Australian asset classes 1900–2011**

		Mean returns % p.a.					Annual returns %				Ten-year returns % p.a.				Current
Return	Asset	GM	AM	SE	SD	SC	Lowest		Highest		Lowest		Highest		year rank
Nominal	Equities	11.3	12.9	1.8	18.5	-0.13	-40.4	2008	66.8	1983	1.7	1974	23.7	1986	102
	Bonds	5.5	6.1	1.1	11.4	0.16	-19.1	1973	53.8	1932	-1.9	1920	17.3	1991	14
	Bills	4.6	4.6	0.4	3.9	0.94	0.7	1951	17.3	1989	0.9	1957	14.3	1990	42
	Inflation	3.9	4.0	0.5	5.2	0.54	-12.6	1921	19.3	1951	-2.2	1933	11.4	1983	54
Real	Equities	7.2	8.9	1.7	18.2	-0.06	-42.5	2008	51.5	1983	-5.6	1978	17.1	1929	101
	Bonds	1.6	2.4	1.2	13.2	0.29	-26.6	1951	62.2	1932	-8.4	1920	14.1	1934	13
	Bills	0.7	0.8	0.5	5.4	0.59	-15.5	1951	18.5	1921	-6.7	1956	6.8	1993	49
	Exchange rate	0.1	0.8	1.1	11.7	0.08	-39.9	1931	46.4	1933	-8.3	1947	7.6	2011	54
Premiums	Equities vs. bills	6.5	8.0	1.7	17.7	-0.11	-44.4	2008	49.2	1983	-3.6	1978	14.8	1959	101
	Equities vs. bonds	5.6	7.5	1.9	19.9	-0.07	-52.9	2008	66.3	1980	-4.4	1996	16.3	1959	109
	Bonds vs. bills	0.9	1.4	1.0	10.4	0.09	-23.3	1973	48.2	1932	-6.6	1982	9.3	1940	10

GM=geometric mean; AM=arithmetic mean, SE=standard error of mean; SD=standard deviation; SC=serial correlation; Ten-year returns to end of given year

Source: Elroy Dimson, Paul Marsh and Mike Staunton, Triumph of the Optimists, Princeton University Press, 2002, and subsequent research.

Market Evidence on the Cost of Equity

Victorian Gas Access Arrangement Review 2013-2017

8 November 2012

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8 November 2012

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Market evidence on the cost of equity - Victorian Gas Access Arrangement Review 2013-2017

Enclosed is my expert report on the cost of equity in relation to the Australian Energy Regulator's review of each of Envestra's, Multinet's and SP AusNet's Access Arrangements for their respective gas distribution networks in Victoria, for Envestra's Access Arrangement for its Albury Distribution Network and for the APA Group's Access Arrangements for GasNet. My report has been prepared in accordance with the Federal Court of Australia expert witness guidelines.

Our engagement was performed in accordance with our engagement letter dated 5 November 2012, and our procedures were limited to those described in that letter.

As outlined in our engagement letter, our report is based on information and instructions provided by your engaging solicitor, Johnson, Winter & Slattery. Unless otherwise noted, we have not conducted an audit or other verification of any information we reviewed. We have assumed that the information we relied upon is accurately stated.

Neither my report nor any part of it may be published or distributed other than for the specified purpose without obtaining the written consent of Ernst & Young, unless disclosed in accordance with any law or by order of a Court of competent jurisdiction or as reasonably required for the purpose of the proceedings.

Yours sincerely

Craig Mickle
Partner
Ernst & Young

Attachment
Copy to: Roxanne Smith
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Adelaide SA 5000
roxanne.smith@jws.com.au

This report was prepared at the request of Envestra Limited, Multinet Gas Pty Ltd and SPI Networks (Gas) Pty Ltd and the APA GasNet (Operations) Australia Pty Ltd (the client) solely for the purpose of providing advice to the client on aspect of estimating the cost of equity in the context of the Australian Energy Regulator's Draft Decisions for the Gas Businesses. In carrying out our work and preparing this report, we have worked on the instructions of the Johnson Winter & Slattery acting on behalf of the client only and we have not taken into account the interests of any other parties. Ernst & Young does not extend any duty of care in respect of this report to anyone other than the client.

The services provided by Ernst & Young do not constitute an audit in accordance with generally accepted auditing standards, or a review, examination or other assurance engagement in accordance with auditing and assurance standards issued by the Australian Auditing and Assurance Standards Board. Accordingly, we do not provide an opinion or any other form of assurance under audit or assurance standards.

Except to the extent that we have agreed to perform the specified scope of work, we have not verified the accuracy, reliability or completeness of the information we accessed, or have been provided with by the client, in preparing this report.

Liability limited by a scheme approved under Professional Standards Legislation.

Contents

A Introduction

Background

1. I am a Partner of Ernst & Young. My curriculum vitae is at Appendix E.

2. I do not provide independent expert valuation services as part my role. A subsidiary of my firm has a relevant financial services licence and provides valuation services, and acts as an independent expert. I have not been involved in any capacity in the independent expert reports produced. I regularly undertake work, however, that relates to the value the market might assign to particular assets, including advising on infrastructure asset transactions.

3. I have prepared this report to address the question as to the cost of equity to be used in determining prices for services provided by the Victorian gas distribution networks owned and operated by Envestra, Multinet, SP AusNet, the distribution network owned and operated by Envestra in Albury, and the Victorian gas transmission network owned and operated by the APA GasNet (the Gas Businesses).

4. I have been instructed by Johnson Winter & Slattery, who are acting as legal advisers to Envestra, Multinet and SP AusNet.

5. I have been instructed that the following is the relevant background to this matter.

   a. In accordance with the National Gas Law (NGL) and the National Gas Rules (NGR), each Gas Business has submitted proposed revisions to the Access Arrangement (Access Arrangement Revisions Proposal) for its gas distribution or transmission network as the case may be, to the Australian Energy Regulator (AER) for approval. In each case, the Access Arrangement Revisions Proposal sets out matters required under the NGL and NGR which are relevant to the terms and conditions on which the Gas Business proposes to provide access to its network during the period 1 January 2013 to 31 December 2017.

   b. Each of the Gas Businesses included in its Access Arrangement Revisions Proposal, a proposed rate of return estimated using the parameter values set out in Table 1.

Table 1: Initial rates of return proposed by the Gas Businesses

Parameter	Envestra	Multinet	SP Ausnet	GasNet
Nominal risk free rate				
- Cost of equity estimation	5.99%	5.99%	5.99%	3.99%
- Cost of debt estimation	3.99%	3.99%	3.99%	3.99%
Inflation	2.5%	2.5%	2.5%	2.5%
Equity beta	0.8	0.8	0.8	0.8
Market risk premium	6.0%	6.0%	6.0%	8.5%
Debt risk premium	3.92%	3.92%	3.92%	3.92%
Gearing	60.0%	60.0%	60.0%	60.0%
Rate of return proposal				
Nominal post-tax cost of equity	10.80%	10.80%	10.80%	10.79%
Nominal pre-tax cost of debt	7.91%	7.91%	7.91%	7.91%
Nominal vanilla WACC	9.06%	9.06%	9.06%	9.06%

   c. The AER has issued a draft decision on each Gas Businesses' Access Arrangement Revisions Proposal. The AER's draft decisions (Draft Decisions) are:

      - Access Arrangement draft decision Envestra Ltd 2013-17, September 2012;
      - Access arrangement draft decision Multinet Gas (DB No. 1) Pty Ltd, Multinet Gas (DB No. 2) Pty Ltd 2013–17, September 2012;

- Access Arrangement draft decision SPI Networks (Gas) Pty Ltd 2013-17, September 2012; and
- Access Arrangement draft decision APA GasNet (Operations) Australia Pty Ltd 2013-2017, September 2012.

d. In each draft decision, the AER advised that it would not approve the Access Arrangement Revisions Proposal.

e. For the Access Arrangement Revisions Proposals to be accepted, the AER has required (among other things) amendments to the rate of return proposals. The required amendments to those proposals are shown in Table 2.

Table 2: AER required amendments to the Gas Businesses' rate of return proposals

Parameter	Envestra	Multinet	SP Ausnet	GasNet
Nominal risk free rate				
- Cost of equity estimation	2.98%	2.98%	2.98%	2.98%
- Cost of debt estimation	2.98%	2.98%	2.98%	2.98%
Inflation	2.5%	2.5%	2.5%	2.5%
Equity beta	0.8	0.8	0.8	0.8
Market risk premium	6.0%	6.0%	6.0%	6.0%
Debt risk premium	3.76%	3.76%	3.76%	3.76%
Gearing	60.0%	60.0%	60.0%	60.0%
Rate of return proposal				
Nominal post-tax cost of equity	7.78%	7.78%	7.78%	7.78%
Nominal pre-tax cost of debt	6.74%	6.74%	6.74%	6.74%
Nominal vanilla WACC	7.16%	7.16%	7.16%	7.16%
Implied market cost of equity				
Risk free rate	2.98%	2.98%	2.98%	2.98%
Market risk premium	6.0%	6.0%	6.0%	6.0%
Market cost of equity	8.98%	8.98%	8.98%	8.98%

f. The Gas Businesses disagree with the AER's assessment of the nominal post-tax cost of equity. The principal issue in dispute is whether the cost of equity assessed by the AER is commensurate with prevailing conditions in the market for funds and the risks involved in providing reference services.

g. The Gas Businesses have proposed the following rates of return in response to the AER's Draft Decisions.

Table 3: Rates of returns proposed by the Gas Businesses in response to the AER's Draft Decisions

Parameter	Envestra	Multinet	SP Ausnet	GasNet
Nominal risk free rate				
- Cost of equity estimation	5.00%	5.00%	5.00%	3.22%
- Cost of debt estimation	2.98%	2.98%	2.98%	3.22%
Inflation	2.5%	2.5%	2.5%	2.5%
Equity beta	0.8	0.8	0.8	0.8
Market risk premium	6.0%	6.0%	6.0%	8.72%
Debt risk premium	3.76%	3.76%	3.76%	3.46%
Gearing	60.0%	60.0%	60.0%	60.0%
Rate of return proposal				
Nominal post-tax cost of equity	9.80%	9.80%	9.80%	10.20%
Nominal pre-tax cost of debt	6.74%	6.74%	6.74%	6.68%
Nominal vanilla WACC	7.96%	7.96%	7.96%	8.09%
Implied market cost of equity				
Risk free rate	5.00%	5.00%	5.00%	3.22%
Market risk premium	6.0%	6.0%	6.0%	8.72%
Market cost of equity	11.0%	11.0%	11.0%	11.94%

The assignment

6. I have been instructed to prepare an expert report which contains:

    a. my opinion on the best market evidence available to assess the prevailing cost of equity in the market for funds in Australia; and

    b. an analysis of the available evidence including my opinion of the estimated prevailing cost of equity that can be drawn from that evidence.

7. Based on the analysis above, I am required to provide my opinion as to whether:

    a. the cost of equity estimated by the AER in the Draft Decisions, meets the requirement of Rule 87(1) of the National Gas Rules that it be commensurate with prevailing conditions in the market for funds and the risks involved in providing reference services; and

    b. the cost of equity proposed by the Gas Businesses in response to the AER's Draft Decisions meets the requirement of Rule 87(1) of the National Gas Rules that it be commensurate with prevailing conditions in the market for funds and the risks involved in providing reference services.

Information

8. In the preparation of this report I have relied on, reviewed or made reference to the documents listed in appendices A and B. I have not conducted an audit or other verification of any of the information in these documents. I have assumed that the information provided in those documents is accurately stated.

9. I have not had any communications with the independent experts who have produced the expert reports referred to in this statement about the content of their reports.

10. I do not warrant the accuracy or reliability of any of the information supplied to me or obtained by me.

11. The opinions set out in this report may alter if there is any change in the information supplied to me or obtained by me.

Reliance on this report

12. This report has been prepared, and may be relied on, solely for the purposes specified in paragraphs 6 and 7. Neither Ernst & Young nor I accept responsibility to anyone other than the Gas Businesses, or to the Gas Businesses, if they use the report for some other purpose.

13. Neither this report nor any part of it may be published or distributed other than for the specified purposes without obtaining the written consent of Ernst & Young.

Assistance by colleagues

14. In order to arrive at my opinions in this matter, I have selected colleagues to assist me. My colleagues carried out the work that I decided they should perform. I have reviewed their work and original documents to the extent I considered necessary to form my opinions. The opinions expressed in this report are mine.

Fees for this assignment

15. The fees received or receivable in relation to this assignment are based upon agreed hourly rates for time incurred.

Conduct of this assignment

16. In accordance with Federal Court Practice Note CM7, *Expert Witnesses in Proceedings in the Federal Court of Australia*, I state that I have made all the inquiries which I believe are desirable and appropriate; and that no matters of significance that I regard as relevant to my opinion have, to my knowledge, been withheld.

17. I understand that my report is to be prepared in respect of the Draft Decisions. I acknowledge that the report will be provided to the AER by the Gas Businesses in their respective responses to the Draft Decisions.

Structure of report

18. In Section B, I set out a summary of my opinions.

19. In Section C, I set out the bases for my opinions. This includes information on:

    a. the details of the approach that I have adopted to conduct the analysis of independent expert valuation reports;

    b. my observations on the data which underpin my analysis; and

    c. the results of my analysis of the data.

20. The report contains the following appendices:

    a. Appendix A Data source and sample selection

    b. Appendix B Reports analysed for cost of equity

    c. Appendix C Inferring the market cost of equity

    d. Appendix D How independent experts apply the CAPM

    e. Appendix E My curriculum vitae

    f. Appendix F My instructions

Abbreviations

In this report, I use the following abbreviations:

AER	Australian Energy Regulator
APA Group	APA GasNet (Operations) Australia Pty Ltd
ASIC	Australian Securities Investment Commission
ASX	Australian Securities Exchange
CAPM	Capital Asset Pricing Model
Gas Business	Each of Envestra, Multinet, SP Ausnet and GasNet
Gas Businesses	Envestra, Multinet, SP Ausnet and GasNet jointly
Envestra	Envestra Limited
HDUF	Hastings Diversified Utilities Fund
Multinet	Multinet Gas Pty Ltd (DB No. 1) and Multinet Gas (DB No. 2) Pty Ltd
NGL	National Gas Law
NGR	National Gas Rules
SP Ausnet	SPI Networks (Gas) Pty Ltd
WACC	Weighted Average Cost of Capital

B Summary of my opinion

21. In this section I summarise the opinions expressed elsewhere in this report, and the reasons for them. This summary should be read in conjunction with the full report.

22. To assess the prevailing cost of equity in the Australian market for funds I have undertaken a review and analysis of independent expert reports.

23. In my opinion these reports provide the best market evidence publicly available to assess the prevailing cost of equity in the Australian market for funds for the reasons outlined in paragraphs 36 to 51. In particular, this includes:

    a. the requirements for them to be prepared by experts in their field;

    b. the requirements for these experts to be transparent on the material assumptions underpinning their valuations; and

    c. that the report findings support numerous successful transactions.

24. The data which underpins my review covers 889 independent expert reports dated between 1 January 2008 and 10 October 2012 and published in the CONNECT 4 Expert Reports database. This timeframe was selected to provide a longer term perspective of how experts estimate the cost of equity and to capture any trends in the way independent experts estimate the cost of equity. Of the 889 independent expert reports, 132 reports qualified for more detailed analysis to assess how the forward-looking cost of equity is estimated and applied to derive the discounted value of the expected future cash flows.

25. Seventeen (17) of the 132 independent experts were issued in 2012 and these reports were further analysed in forming my view on the cost of equity that is expected to prevail over the period of the expected future cash flows given the market conditions at the time of the valuation. This is consistent with what the AER is obliged to reflect in its assessment of the cost of equity in the Draft Decisions (i.e. the prevailing cost of equity).

26. In assessing the prevailing cost of equity in the Australian market for funds, I have focussed on the market cost of equity (i.e. those components of the CAPM that are influenced by market-wide factors; namely, the risk free rate and market risk premium), as defined in paragraph 56.

27. The average implied market cost of equity based on the 17 reports issued in 2012 is 10.7%. This is 1.2 percentage points higher than the implied average market cost of equity of 9.5% which would result if the market cost of equity in each of these 17 reports were to be estimated by applying the methodology adopted by the AER and described in its Draft Decisions for the Gas Businesses. It is also 1.7 percentage points higher than the market cost of equity implied in the AER's Draft Decisions of 9.0%.

28. The 1.2 percentage point gap excludes the impact of the difference in the value assigned to imputation credits. Including the impact relating to imputation credits increases the gap by 1.0 percentage point, on average.

29. In my opinion, the difference in the prevailing market cost of equity implied by independent experts and the AER's implied market cost of equity[1] is therefore 2.2 percentage points, on average.

30. Based on the above results, in my opinion:

[1] As estimated based on the approach described in paragraph 63.b.

a. the cost of equity estimated by the AER in the Draft Decisions, does not meet the requirements of Rule 87(1) of the National Gas Rules that it be commensurate with prevailing conditions in the market for funds and the risks involved in providing reference services; and

b. the cost of equity proposed by the Gas Businesses in response to the AER's Draft Decisions meets the requirement of Rule 87(1) of the National Gas Rules that it be commensurate with prevailing conditions in the market for funds and the risks involved in providing reference services. This is because the costs of equity proposed by the Gas Businesses imply market costs of equity that are generally proximate with that observed from independent expert reports and are also within the range of values observed.[2]

[2] As set out in Appendix C.

C. Basis of my opinion

The cost of equity

31. Capital market practitioners, including those charged with preparing independent expert reports (independent experts) estimate the cost of equity for the purpose of valuing certain business and investment opportunities (transactions). The cost of equity is typically estimated and then blended with a cost of debt to establish a discount rate (often defined as a WACC) which is, in turn, used to discount future cash flows expected if a transaction were to proceed.[3] The discounted value of the future net cash flows, the present value of the transaction, is a measure of the market value of the business or asset. It may be compared with the present values of alternatives to the transaction, including the alternative of "doing nothing".

32. The cost of equity is the return that the market expects from an investment given the risks associated with it. The actual cost of equity may change during the period in which cash flows are expected to occur. However, most valuations typically apply a single discount rate which represents a best estimate (given the information available at the valuation date) of the forward-looking discount rate anticipated to prevail over the period of the expected cash flows.

33. The cost of equity is not directly observable, so it must be estimated or inferred from market data. Finance theory usually guides the process of estimation and the CAPM is often applied in this process.

34. The CAPM explains the expected rate of return on a financial asset as the sum of a risk free rate of return and a premium for risk:

    $k_e = r_f + \beta \times (r_m - r_f)$

    where:

    - k_e is the nominal post-tax expected cost or, rate of return on equity;
    - r_f is the nominal risk free rate of return. In Australia, it is generally measured based on the yield on the 10 year Commonwealth Government bond;
    - β (beta) is the contribution which the financial asset in question makes to the riskiness of an investor's portfolio;
    - r_m is the expected return on the market portfolio;[4] and
    - $(r_m - r_f)$ represents the excess return over the market portfolio. It is also commonly referred to as the market risk premium or MRP.

35. Independent experts widely use the CAPM to estimate the cost of equity. The AER also has applied the CAPM for this purpose in its Draft Decisions for the Gas Businesses.

Best market evidence available: independent expert reports

36. The Corporations Act and the ASX Listing Rules specify the circumstances where an expert report must be issued to those shareholders who are affected by certain types of transactions (e.g. takeover bids, mergers/schemes, related party transactions, buy-backs, acquisitions / divestments, and others). Even where there is no requirement for an expert report under the Corporations Act or the ASX Listing Rules, the directors of a company may still voluntarily commission an expert report to assist security holders in making informed decisions in relation to certain proposed transactions (e.g. as part of assessing a bid from a party which is associated but not considered a 'related party' due to not meeting certain shareholding thresholds).

[3] The most commonly used WACC formulation is the after-tax nominal WACC which is calculated as the sum of [After-tax cost of Debt X Gearing] and [Cost of Equity X (1-Gearing)].
[4] As noted later in paragraph 56, the market cost of equity is the sum of risk free rate and market risk premium assuming a beta of 1.0.

37. Expert reports set out the expert's opinion on whether a proposed transaction is 'fair and reasonable' and / or 'in the best interests of' affected shareholders. These terms are not defined in the Corporations Act and the ASX Listing Rules, however, guidance on their meaning and the factors which an expert should consider in arriving at its opinion is provided by ASIC in Regulatory Guide 111, *Content of expert reports*. Regulatory Guide 112 provides guidance on the *Independence of experts*.[5]

38. An expert must consider the value of the benefit received versus value of the benefit provided to the counterparty in expressing an opinion on the fairness of the transaction. As such, the expert's report would generally (but not always) contain a valuation of the asset(s).

39. Most experts have regard to the results of more than one valuation methodology in arriving at their valuation of an asset. They typically consider the results from a primary valuation methodology against other valuation methodologies. The choice of valuation methodology to employ will depend upon the specific attributes of the asset as well as the availability of reliable information.

40. The cost of equity is typically estimated where a discounted cash flow method of valuation is employed by the expert to value the asset, either as the primary or secondary method of valuation. The expert may decide not to value an asset using a discounted cash flow methodology in instances where it is not possible to make reliable forecasts of the future net cash flows of the asset.

41. The independent expert reports are prepared by accredited independent experts, working within an explicit regime of regulation, comprising both formal statutory rules and less formal guidelines, which require that the experts be accountable for the results of their work.

42. The experts preparing independent expert reports which express an opinion as required by under the Corporations Act or ASX Listing Rules should be experts in their field. Section 9 of the Corporations Act defines an expert as *"a person whose profession or reputation gives authority to a statement made by him or her"*.[6] Independent experts are expected to state their qualifications and experience in the independent expert reports they prepare.

43. ASIC requires that experts who prepare an independent expert reports:

    a. cannot be associated with certain parties who have interests in the transaction for which the independent expert report is prepared;

    b. must disclose certain relevant interests and relationships when preparing reports required by the Corporations Act; and

    c. must hold an Australian financial services licence which imposes obligations to manage potential conflicts of interest.

44. In paragraph 111.128 of Regulatory Guide 111 ASIC advises that it will consider regulatory action if it considers there are material issues about the adequacy and completeness of an independent expert's analysis, or if it has concerns about the expert's independence. Regulatory action may include revocation or suspension of the independent expert's licence.

45. The assumptions and estimates made for the purpose of arriving at a cost of equity, and the reasons for using that cost, are usually explicitly documented in the independent expert report. ASIC's Regulatory Guide 111 recommends that an expert:

[5] ASIC, Regulatory Guide 111: Content of expert reports, March 2011 and ASIC, Regulatory Guide 112: Independence of experts, March 2011. These guidelines superseded versions dated October 2007 and included some revisions to provide additional guidance on various matters.

[6] Commonwealth Government, Corporations Act 2001

a. justify its choice of methodology or methodologies and describe the method or methods used in its report;[7] and

b. disclose all material assumptions on which its report is based.[8]

46. Independent expert reports blend financial theory with day-to-day experience in capital markets in applying the CAPM. For example, independent expert reports often use the CAPM to estimate the cost of equity, but typically:

    a. exercise discretion in the application of the CAPM and the interpretation of data (e.g. they vary how they may derive parameter estimates) in recognition of the limitations of the model; and

    b. assess the valuation results obtained from the application of the CAPM with the values obtained from using other methods (or vice versa, depending on the respective quality of the relevant information). These other methods typically include capitalising earnings or (near term) prospective earnings using observed trading and / or transaction multiples, or estimating discount rates using the Dividend Growth Model.

47. Independent experts thereby corroborate the results obtained from the use of the CAPM to ensure the results accord with market expectations.

48. The valuation produced reflects the value at a point in time, sometimes referred to as the valuation date.[9]

49. I observe that these independent expert reports support numerous successful transactions (e.g. by providing a widely accepted valuation basis). For example, Appendix A provides some data in respect of takeovers.

50. The cost of equity provided in independent expert reports is the evidence of expert capital market practitioners acting independently in accordance with defined standards of independence, and based on documented and explicitly justified analysis.

51. In my opinion, it is the best market evidence publicly available to assess the prevailing cost of equity in the Australian market for funds.

Data and sample selection

52. To assess the prevailing cost of equity in the Australian market for funds I have undertaken a review and analysis of independent expert reports.

53. The data which underpins my review covers 889 independent expert reports issued between 1 January 2008 and 10 October 2012 and published in the CONNECT 4 Expert Reports database. This timeframe was selected to provide a longer term perspective of how experts estimate the cost of equity and to capture any trends in the way independent experts estimate the cost of equity. Of the 889 independent expert reports, 132 reports qualified for more detailed analysis to assess the prevailing cost of equity.

54. Appendix A provides further information on my sample selection process and Appendix B provides a summary list of these reports.

[7] ASIC Regulatory Guide 111, paragraph 111.67

[8] ASIC Regulatory Guide 111, paragraph 111.75

[9] The AER is estimating a rate of return which is applied to the value of the regulatory asset base to set prices for a period of time. This process is similar to applying a WACC to discount future expected cash flows to obtain a value for the business or asset.

Estimating the market cost of equity

55. In assessing the prevailing cost of equity in the Australian market for funds, I have focussed on how independent experts estimate those components of the CAPM which are influenced by market-wide factors, namely, the risk free rate and market risk premium. My analysis therefore focuses on the market cost of equity.[10] I also understand that the value assigned to equity beta is not an issue of contention between the parties.

56. The market cost of equity reflects the expected rate of return from investing in the Australian equity market as a whole. The Australian equity market has a beta of 1.0 so, in terms of the CAPM, the market cost of equity is the sum of the risk free rate of return and the market risk premium. Like the cost of equity, it cannot be directly observed.

57. Seventeen (17) of the 132 independent expert reports were issued in 2012 and these reports were further analysed in forming my view on the cost of equity that is expected to prevail over the period of the expected future cash flows given the market conditions at the time of the valuation. This is consistent with what the AER is obliged to reflect in its assessment of the cost of equity in the Draft Decisions (i.e. the prevailing cost of equity). Appendix C provides further details.

58. The views of the experts on the average market cost of equity in 2012 can be implied by:

    a. adding the risk free rate to the market risk premium as applied in these 17 reports;[11] and

    b. where I have identified in any of the reports that the cost of equity or the discount rate applied differs from that calculated by the expert[12], adding the difference to the sum of the risk free rate and the market risk premium in (a), taking into account the assumed gearing level.[13]

59. Using this approach, my analysis indicates that the average market cost of equity implied by independent experts is 10.7% in 2012. Appendix C provides further details.

60. I note that this approach attributes any difference between the cost of equity or discount rate applied and that calculated to the market cost of equity (i.e. in addition to the risk free rate and the market risk premium) rather than the cost of debt or the equity beta. I consider this approach appropriate because of the 4 reports that applied a different discount rate to that produced based on the calculated costs of equity and debt:

    a. one (1) applies a cost of equity different to that calculated; and

    b. one (1) assumes no debt. The other 2 do not recognise there is particular uncertainty in the cost of debt (e.g. the focus is on the debt ratings of comparable companies), which is not the case for the cost of equity.[14]

61. Appendix C shows that in 2012 independent experts have considered, in light of prevailing market conditions, whether:

    a. observed bond yields provide a suitable basis for measuring the risk free rate of return;

[10] In making such inferences, I note that whilst the independent expert makes assumptions on the appropriate values for the risk free and market risk premium (i.e. the market cost of equity), these assumptions are made in the process of arriving at the overall cost of equity for the asset they are valuing. Appendix D provides further information how independent experts apply the CAPM to estimate the cost of equity.
[11] Where ranges are used, I have taken the mid-point value.
[12] As identified in Appendix C, this occurs in the case of 4 reports. This excludes instances where the independent expert has made rounding adjustments to the calculated discount rate. Some of those are, however, not symmetrical. Including them does not materially alter the results I have obtained. Where ranges are used, I have taken the mid-point value.
[13] There is one report where the applied discount rate appears to have taken into account issues associated with estimating the cost of debt, so these have not been included in the implied market cost of equity (see Appendix C).
[14] The equity beta appears to have been set independently and in at least three cases the applied equity beta appears to differ from the relevant data observed.

b. it is appropriate to adopt a market risk premium higher than commonly adopted particularly in response to what is implied by the observed bond yields; and / or

c. the overall cost of equity and / or discount rate calculated using the CAPM and the WACC formulae appropriately reflect market expectations.

62. Similar considerations are evident in the cost of equity assessments of independent experts in reports issued in late 2008 to mid 2009. In these periods, the yield on 10 year Commonwealth Government Bonds was or is below (and often well below) 5.0%.

Comparison with the AER's Draft Decisions

63. I have compared the market cost of equity implied from independent expert reports for 2012 to the market cost of equity implied in the AER's Draft Decisions in considering whether the AER's assessment meets the requirements of Rule 87(1) of the National Gas Rules. This involved:

a. taking the market cost of equity implied in each of the 17 reports in 2012;

b. re-estimating the implied market cost of equity in each of the 17 reports assuming that the approach adopted by the AER was applied in selecting the values for the risk free rate and market risk premium.[15] The implied market cost of equity obtained based this approach (averaged across the 17 expert reports) is hereinafter referred to as the 'AER's implied market cost of equity'; and

c. subtracting the AER's implied market cost of equity in (b) above, from the independent experts' implied market cost of equity in (a) above.

64. Appendix C provides the results of the above comparison for each of the 17 reports, and on average across the 17 reports. It shows that in 2012 the experts' implied market cost of equity is on average 1.2 percentage points higher than the AER's implied market cost of equity of 9.5%. It is also 1.7 percentage points higher than the market cost of equity implied in the AER's Draft Decisions of 9.0%.

65. Figure 1 and Figure 2 below highlight the discrepancy between the market costs of equity determined by independent experts and by the AER in its Draft Decisions.

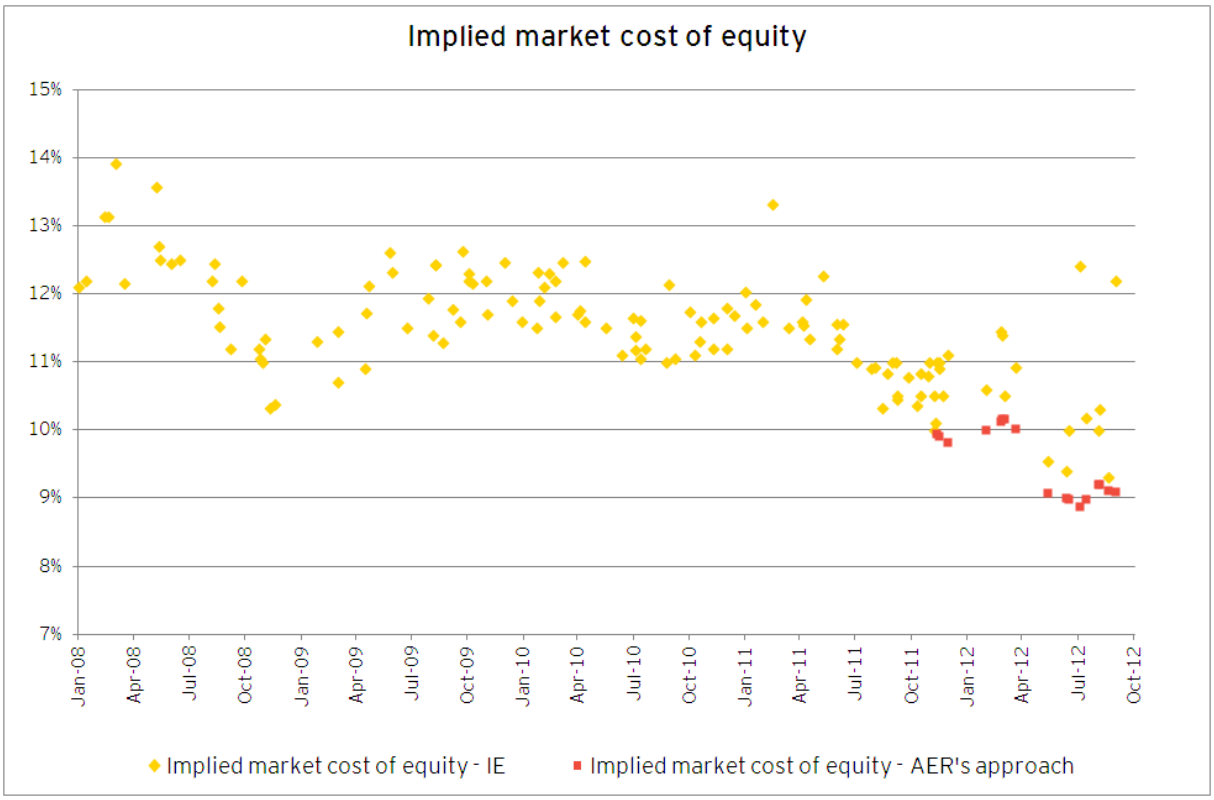
66. Figure 1 shows the implied market costs of equity of independent experts from 2008-2012 and the AER's implied market cost of equity for 2012.[16] It shows that the AER's implied market costs of equity generally lie below the range implied by independent experts.[17]

[15] This involves estimating the nominal risk free rate (which we sourced from the Reserve Bank of Australia statistics F2 Capital Market Yields – Government Bonds, sourced on 11 October 2012) using a previous twenty-day average period from the date where the expert observed the risk free rate or report date where the former was not identified. Because of the uncertainty over the precise period to apply, I have tested the sensitivity of the results using different measurement periods. It does not materially alter the results.

[16] Using the approach outlined in paragraph 63. This includes 6 instances out of 115 prior to 2012 where independent experts adopted a cost of equity or discount rate different to that calculated.

[17] This is prior to the consideration of imputation credits, which is discussed in paragraphs 76 to 82, and which have the affect of expanding the difference between the implied market cost of equity of independent experts and of the AER.

Figure 1: Implied market costs of equity

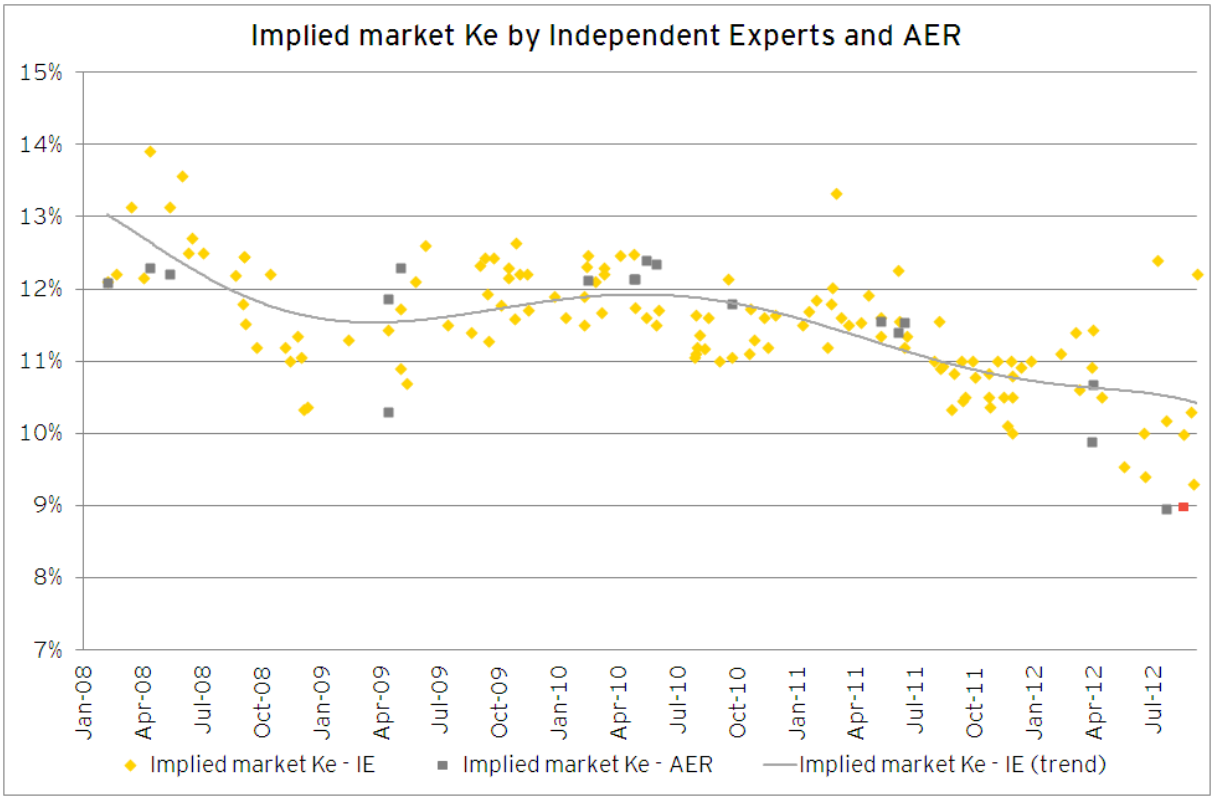


67. Figure 1 shows two recent data points in 2012 which relate to Grant Samuel's expert reports for the DUET Group and HDUF, where the implied market cost of equity is 12.2% and 12.4% respectively. This is the result of Grant Samuel applying a cost of equity and / or discount rate different to its calculated values. These implied market cost of equity estimates convert to costs of equity (i.e. once the expert's assessment of the equity beta is taken into account) of 11.0% and 11.2%, respectively. Paragraphs 70 to 72 provide Grant Samuel's explanation for its approach.

68. Figure 2 compares the implied market cost of equity from expert reports with the implied market cost of equity in the AER's gas and electricity decisions over the period and its recent Draft Decisions.[18]

[18] These decisions cover both the transmission and distribution sectors. A couple of the decisions in 2008 were made by the ACCC. We note that most of the electricity distribution decisions made since AER's first periodic WACC Review in March 2009 applied a value of 6.5% for the market risk premium and estimated the risk free rate based on the yield on 10 year Commonwealth Government Bonds. These approaches are explicitly set out in the AER's Statement of Regulatory Intent (SORI). The National Electricity Rules provide that the distribution businesses and the AER are permitted to depart from the approaches set out in the SORI provided there is persuasive evidence to do so. The AER first departed from applying a value of 6.5% for the MRP in its decision on Aurora Energy in April 2012, where it adopted an MRP of 6.0%.

Figure 2: Comparison of implied market costs of equity (Ke) from expert reports with AER decisions



Note: AER Draft Decisions highlighted in red.

69. It shows that the implied market cost of equity in most of the AER's previous decisions were in line with the views of independent experts, but this alignment has fallen away in the AER's recent Draft Decisions.[19] It also shows that the AER's Draft Decisions for the Gas Businesses are out of line with almost all of its previous decisions.

Specific comments made by independent experts

70. There are a few expert reports which warrant closer examination as they provide relevant examples of how market considerations affect an independent expert's assessment of the cost of equity and / or discount rate.

71. Grant Samuel's recent assessment of the value of the management rights associated with the DUET Group appears to apply a cost of equity of 11.0% when its calculated cost of equity was 7.8%. It stated as follows:

"In Grant Samuel's opinion, these calculations understate the true cost of capital. In this context:

- *anecdotal information suggests that equity investors have substantially repriced risk since the global financial crisis and that acquirers are pricing offers on the basis of hurdle rates well above those implied by theoretical models. This can be evidenced through the decline in listed entity earnings multiples (relative to the peak in 2007) although it has yet to be translated into the measures of market risk premium (at least those based on longer term historical data). In this regard, an increase in the market risk premium of 1% (i.e. from 6% to 7%) would increase the calculated WACC range to 7.1-7.7%.*

Another way of looking at this is to note that while long term interest rates have fallen by approximately 150-200 basis points over the past 12 months there has been no corresponding lift in earnings multiples, suggesting investors have offset this reduction with an increase in their risk premium and/or a reduction in long term earnings growth rates; and

[19] Excepting the issue of imputation credits

- *global interest rates, including long term bond rates, are at very low levels by comparison with historical norms reflecting the very substantial amounts of liquidity being pumped into many advanced economies to stimulate economic activity. Effective real interest rates are now extremely low, if not negative in some cases (e.g. the United States). Grant Samuel does not believe this position is sustainable. Conceptually, the interest rates used to calculate the discount rate should recognise this expectation (i.e. they should be forecast for each future period) but for practical ease market practice is that a single average rate based on the long term bond rate is generally adopted for valuation purposes. Some academics/valuation practitioners consider it to be inappropriate to add a "normal" market risk premium (e.g. 6%) to a temporarily depressed bond yield and therefore advocate that a "normalised" risk free rate should be used."*[20]

72. Grant Samuel made similar statements in respect of its HDUF report (where it also applied a different discount rate to that estimated). This report also stated that:

> *"the market upheaval since 2007 has seen a repricing of risk by investors and global interest rates, including long term bond rates, are at very low levels by comparison with historical norms. The CAPM methodology does not readily allow for these types of events."*[21]

73. Deloitte adopted a value for the (equity) market risk premium which was different from the value adopted for the same parameter in an immediately prior expert report in four instances. Similar practices were also adopted by BDO and Lonergan Edwards. Deloitte cites similar reasons as Grant Samuel to explain why it adopted a value of 7.0% for the market risk premium (in its April 2012 report on Gloucester Coal Ltd).[22] Deloitte noted that:

> *"We have considered both the historically observed EMRP and the prospective approaches as a guideline in determining the appropriate EMRP to use in this report. Australian studies on the historical risk premium approach generally indicate that the EMRP would be in the range of 5% to 8%.*
>
> *The recent decline in equity m (sic) worldwide and the difficultly companies are experiencing in raising equity capital may be indicative of investors demanding a greater risk premium. In addition, with particular regard to expected future cash flows and observed bond default spreads, current prospective measures appear to indicate an increase in the EMRP.*
>
> *In recent years it has been common market practice in Australia in expert's reports and regulatory decisions to adopt an EMRP of 6%.*
>
> *Having considered the various approaches and their limitations, we consider an EMRP of 7% to be appropriate."*

74. The discussion by Grant Samuel at paragraph 70 around trading multiples raises a key issue relevant to the implied market cost of equity, particularly given the circumstances that relate to the dispute between the Gas Businesses and the AER (i.e. significant recent falls in the 10 year Commonwealth Government bond yield). It specifically provides corroborating evidence on the extent to which the market cost of equity might have changed in recent times.

75. Grant Samuel finds little evidence based on observed trading multiples over time that the recent falls in Government bond yields have been incorporated into market valuations, which may explain why they (and other independent experts) are reluctant to reflect that in their valuations.

Formulation of the discount rate and the value of imputation credits

76. It is evident from the independent expert reports I have reviewed that the formulation of the discount rate typically applied by independent experts is different to that applied by the AER. Independent expert reports typically apply a nominal post-tax discount rate. The AER estimates what is often referred to as a 'vanilla' discount rate. The AER's approach incorporates a pre-tax cost of debt with a post-tax cost of equity, which effectively means that all tax effects are accounted for within the net cash flows rather than in the discount rate.

[20] Grant Samuel, Internalisation Proposal DUET, 3 October 2012, pages 26-27
[21] Grant Samuel, Independent Expert Report: Pipeline Partners Offer, 3 August 2012, page 2
[22] Deloitte, Independent Expert Report: Gloucester Coal Ltd, 26 April 2012, page 108

77. It is also evident that in calculating a discount rate, independent experts do not assign a value to imputation credits. The AER values imputation credits at 0.25 in its Draft Decisions.

78. The value of imputation credits can be taken into account by adjusting the discount rate applied to net cash flows, or by adjusting the net cash flows (in particular, by adjusting the tax cash flows)[23]. I note that under the AER's approach, the value of imputation credits is reflected in the allowance for the cost of tax. Notwithstanding that the value of imputation credits is made outside of the rate of return, it nevertheless has the effect of lowering the allowed cost of equity, and therefore the returns to equity holders. This is because:

    a. Imputation credits reflect the tax credit investors receive from the Government on dividends that have been paid on a franked basis (i.e. taxed at the corporate level). In effect, investors receive a credit against their personal tax liability for the corporate tax that the company has already paid on the dividends.

    b. To the extent that imputation credits have any value to investors, that value will be incorporated into the lower returns investors require from investing in equity (i.e. a lower market cost of equity). This is because investors will receive part of their required return in the form of the tax credit from the government.

79. To allow an "apples for apples" comparison between the market cost of equity implied from independent expert reports and the AER's implied market cost of equity, it is therefore necessary to include the difference in the value assigned to imputation credits by independent experts and the AER.

80. To estimate the difference in value for 2012 I have considered the proportion of the return which the equity holder receives from the government by way of a tax credit as follows:

    a. The company pays tax (T) at the rate of 30% on each dollar of pre-tax profits. As such it can distribute dividends worth $1-T to the shareholder.

    b. As the dividends have been subject to corporate tax, the government provides imputation credits of T to the shareholder.

    c. If imputation credits are valued by investors, the credits provided by the government would be worth γT to the investor, where γ represents the value of imputation credits.

    d. The shareholder's total return is therefore the sum of (a) and (c) or $1-T(1-\gamma)$. Of this, the proportion provided by the company is (1-t) and the proportion provided by the government (or not required to be provided by the company) is γT.

81. If the corporate tax rate (i.e. T) is 30% (on average) and a value of 0.25 is assigned to imputation credits (i.e. γ) as the AER determines, this means that on average, the proportion of the cost of equity which the AER has assumed will not be provided by the company is 9.677% (i.e. $\gamma T/(1-T(1-\gamma))$).

82. This equates approximately to a 1.0 percentage point difference in the average market cost equity implied by independent experts and the average implied market cost of equity using the AER's approach.[24]

83. This amount should be added to the differences observed in paragraph 64 if an appropriate comparison is to be made between the market cost of equity implied from independent expert reports and the market cost of equity implied by applying the AER's approach.

[23] Where the adjustment is made in the net cash flows, it is necessary to use a consistently defined discount rate.
[24] In practice, it means that the AER's implied market cost of equity is, on average, overstated by this amount.

Conclusion

84. I have reviewed 132 independent experts dated between 1 January 2008 and 10 October 2012 and published on the CONNECT 4 Expert Reports database to analyse how independent experts estimate the cost of equity for use in valuing businesses based on the discounted cash flow methodology. My analysis shows that their focus is on establishing their best estimate of the cost of equity that the market would expect for the relevant business or asset at a point in time.

85. To assess the prevailing cost of equity in the Australian market for funds, I have focussed on:

    a. the 17 independent expert reports that were issued in 2012 (as listed in Appendix C); and

    b. the implied market cost of equity in these expert reports, as defined in paragraph 58.

86. The average implied market cost of equity based on the 17 reports issued in 2012 is 10.7%. This is 1.2 percentage points higher than the implied average market cost of equity of 9.5% which would result if the implied market cost of equity in each of these 17 reports were to be estimated by applying the methodology adopted by the AER. It is also 1.7 percentage points higher than the market cost of equity implied in the AER's Draft Decisions.

87. These differences exclude the impact of the difference in the value assigned to imputation credits. Including the impact relating to imputation credits increases the differences by 1.0 percentage point, on average.

88. In my opinion, the difference in the prevailing market cost of equity implied by independent experts and the AER's implied market cost of equity[25] is therefore 2.2 percentage points, on average.

[25] As estimated based on the approach described in paragraph 63.b.

Appendix A Data source and sample selection

1. In undertaking this review and analysis, I have relied on the independent expert reports from the CONNECT 4 Expert Reports database. CONNECT 4 is a web-based system, operated and maintained by the Thomson Reuters company, which provides information on companies listed on the ASX.[26]

2. The CONNECT 4 Expert Reports database contains specialist reports which have been produced on behalf of ASX Listed companies, dating back to 1992. The Expert Reports in this database deal with proposals including mergers/schemes, acquisitions, divestments, capital reductions, buybacks, reconstructions, de-mergers, takeovers, dual listings, spin-offs, and others. Expert Reports may also be found in other CONNECT 4 databases including the Takeovers database and Company Announcements database.

3. My choice of datasets was informed by a discussion with Thomson Reuters, who advised me that the Expert Reports database contains all Expert Reports that they have identified that were produced on behalf of ASX-listed companies, whereas the Takeover database only includes the subset of the Expert Reports in relation to Takeover proposals and the Company Announcements database only includes Expert Reports when available and relevant to the particular announcement.

4. CONNECT 4 specialises in providing information on companies listed on the ASX and, as advised by Thomson Reuters, makes the 'best efforts' to collect Expert Reports that were produced on behalf of ASX-listed companies. In cases where the relevant parties decided not to release the Expert Reports to public, the Reports might not be available in the CONNECT 4 databases.

5. I have therefore taken the set of reports in the CONNECT 4 Expert Reports database as being the population of reports appropriate for the purposes of my analysis and review.

6. Between 27 August 2012 and 23 October 2012 I extracted, from the CONNECT 4 Expert Reports database, all of the expert reports that were issued (based on the date of the expert report) between 1 January 2008 and 10 October 2012.

7. This period captures a period of time preceding the onset of the Global Financial Crisis up to the most recently available evidence. This sample (and subsets of it) may not necessarily reflect the entire market; indeed, it is likely to be more reflective of the type and level of transactional activity in the market. For example, during this period, a significant amount of that transactional activity has been in the resources sector. These sample issues, however, should not be a concern given that my analysis focuses on the market cost of equity.

8. Through the above process I identified a total of 889 independent expert reports.

9. Of these 889 reports, 267 (30%):

    a. included a valuation of a transaction; and

    b. employed a discounted cash flow valuation method to value a company or its underlying assets/projects or a specific part of its operation, either as the principal method of valuation or as a cross-check on the results of the principal valuation method.

10. Of the 267 independent expert reports which included a discount rate that was used for the valuation, I identified 167 (63% of the 267 or 19% of the 889) reports in which the cost of equity was derived using the CAPM.

[26] Further information is available at http://www.connect4.com.au/

11. The distribution of independent expert reports issued in the period 1 January 2008 to 10 October 2012, by calendar year, are shown in Table 4.

Table 4: Number of expert reports which used the CAPM to estimate the cost of equity

Year expert report issued	Number of experts reports	Number of expert reports which included a discount rate for valuation purposes (A)	Number of expert reports which applied the CAPM to estimate the cost of equity (B)	B/A (%)
2008	145	54	27	50%
2009	213	54	34	63%
2010	204	57	40	70%
2011	208	67	45	67%
2012 (to 10 October)	119	35	21	60%
Total	**889**	**267**	**167**	**63%**

12. The 167 independent expert reports which I identified as including an estimated cost of equity derived by applying the CAPM were prepared by 21 different independent experts. These experts are listed in Table 5, which shows the sample market share of the expert by number of reports produced and by transaction value, as sourced from CONNECT 4.

Table 5: Numbers of reports which used the CAPM to estimate the cost of equity by expert and by value

Name of expert	Number of reports issued	% of reports issued	% by reported transaction value
Deloitte	39	23.4%	24.41%
Grant Samuel	19	11.4%	34.91%
Lonergan Edwards	19	11.4%	18.98%
BDO	16	9.6%	0.66%
Grant Thornton	16	9.6%	1.34%
KPMG	13	7.8%	8.02%
Ernst & Young	10	6.0%	8.02%
RSM Bird Cameron	10	6.0%	0.26%
InterFinancial	6	3.6%	0.13%
PwC	5	3.0%	3.03%
Hall Chadwick	2	1.2%	0.03%
Leadenhall	2	1.2%	0.02%
PKF	2	1.2%	0.08%
Crowe Horwath	1	0.6%	0.00%
DMR	1	0.6%	0.03%
Haines Norton	1	0.6%	0.01%
Innovation Dynamics	1	0.6%	0.01%
Moore Stephens	1	0.6%	0.00%
VMC Global	1	0.6%	0.00%
WHK Horwath Securities Ltd	1	0.6%	0.04%
William Buck	1	0.6%	0.02%
Total	**167**	**100%**	**100%**

13. Table 6 provides the evidence of the number of successful transactions by year. Of the 167 reports, 76 related to takeovers of which 60 were identified as successful in the CONNECT 4 Expert Reports database.[27]

[27] As highlighted in paragraph A2 expert reports are prepared for a range of transactions other than takeovers. CONNECT 4 does not provide statistics on successful transaction other than for takeovers.

Table 6: Number of successful transactions[28]

Year	Successful bids	Unsuccessful bids	Withdrawn	Current
2008	8	3	0	0
2009	13	2	1	0
2010	13	1	4	0
2011	17	2	0	0
2012 (to 10 October)	9	1	1	1
Total	**60**	**9**	**6**	**1**

14. Of the 167 independent expert reports which used the CAPM to derive the cost of equity, 4 did not provide enough information on how the cost of equity was estimated and were therefore not considered further.

15. Out of the remaining 163:

    a. Twenty-seven (27) estimated a cost of equity and discount rate using data from offshore markets (e.g. used foreign bond yields when determining the risk-free rate). I have therefore excluded these independent expert reports given that my focus is on assessing the prevailing cost of equity in the Australian market for funds; and

    b. Four (4) relied on other Commonwealth Government bonds (e.g. 2 year bonds) as a proxy for the nominal risk free rate of return in their analyses. I have excluded these because this approach was chosen for specific purposes (e.g. the life of the asset relevant to the transaction) and do not provide an appropriate basis for comparison with the AER's approach.

16. Through the process outlined above, I identified 132 reports which qualified for further analysis on the prevailing cost of equity.

[28] As at 10 October 2012.

Appendix B Reports analysed for cost of equity

Company Name	Independent Expert	Expert report date
CMI Ltd	InterFinancial	20/02/2008
Anzon Energy Ltd	Deloitte	3/03/2008
Olympia Resources Ltd	BDO	26/03/2008
Austral Gold Ltd	InterFinancial	15/04/2008
CBD Energy Ltd	VMC Global	24/04/2008
DoloMatrix International Ltd	PKF	26/05/2008
Bemax Resources Ltd	Lonergan Edwards	13/06/2008
Sydney Gas Ltd	Grant Thornton	23/06/2008
ARC Energy Ltd	Deloitte	30/06/2008
Macquarie Capital Alliance Group	Deloitte	16/07/2008
Anzon Australia Ltd	KPMG	5/09/2008
Origin Energy Ltd	Grant Samuel	15/09/2008
ERG Ltd	Ernst & Young	17/09/2008
CMI Ltd	InterFinancial	17/09/2008
Sunshine Gas Ltd	Deloitte	19/09/2008
Portman Ltd	KPMG	7/10/2008
Grange Resources Ltd	Lonergan Edwards	28/10/2008
Mount Gibson Iron Ltd	KPMG	21/11/2008
Babcock & Brown Communities Group	Deloitte	28/11/2008
Australian Zircon NL	BDO	10/12/2008
Pacific Energy Ltd	BDO	16/12/2008
Gindalbie Metals Ltd	Deloitte	19/12/2008
Perilya Ltd	Ernst & Young	24/12/2008
Hutchison Telecommunications (Australia) Ltd	Lonergan Edwards	26/02/2009
Macquarie Communications Infrastructure Group	Deloitte	29/04/2009
Gloucester Coal Ltd	PwC	18/05/2009
Consolidated Rutile Ltd	Ernst & Young	18/05/2009
Dioro Exploration NL	KPMG	27/05/2009
Olympia Resources Ltd	BDO	11/06/2009
Macquarie Leisure Trust Group	Lonergan Edwards	25/06/2009
CBH Resources Ltd	Grant Thornton	31/07/2009
Macquarie Airports	KPMG	4/09/2009
CMI Ltd	InterFinancial	18/09/2009
Warwick Resources Ltd	BDO	25/09/2009
Felix Resources Ltd	Deloitte	30/09/2009
eBet Ltd	Grant Thornton	2/10/2009
WebSpy Ltd	BDO	9/10/2009
WestSide Corporation Ltd	Deloitte	20/10/2009
Fox Invest Ltd	BDO	1/11/2009
Lend Lease Primelife Group	Deloitte	2/11/2009
Macquarie Media Group	Ernst & Young	12/11/2009
Moly Mines Ltd	BDO	13/11/2009
United Minerals Corporation NL	Deloitte	19/11/2009
IOR Group Ltd	Deloitte	30/11/2009
Drummond Gold Ltd	InterFinancial	3/12/2009
Alinta Energy Group	Grant Samuel	12/01/2010

Company Name	Independent Expert	Expert report date
Dioro Exploration NL	KPMG	28/01/2010
CBH Resources Ltd	Grant Thornton	26/02/2010
Macarthur Coal Ltd	Lonergan Edwards	26/02/2010
Gloucester Coal Ltd	Deloitte	3/03/2010
Victoria Petroleum NL	Deloitte	5/03/2010
Seven Network Ltd [The]	Deloitte	16/03/2010
CBH Resources Ltd	Grant Thornton	26/03/2010
KFM Diversified Infrastructure and Logistics Fund	Deloitte	29/03/2010
Entellect Solutions Ltd	RSM Bird Cameron	30/03/2010
Consolidated Media Holdings Ltd	Deloitte	23/04/2010
CVC Property Fund	Haines Norton	14/05/2010
CBH Resources Ltd	Grant Thornton	17/05/2010
Arrow Energy Ltd	Deloitte	2/06/2010
Gloucester Coal Ltd	Deloitte	19/06/2010
Jupiter Mines Ltd	Ernst & Young	22/06/2010
Centennial Coal Company Ltd	Ernst & Young	16/08/2010
iiNet Ltd	Lonergan Edwards	18/08/2010
Australian Power and Gas Company Ltd	Grant Thornton	19/08/2010
Healthscope Ltd	Grant Samuel	20/08/2010
Gloucester Coal Ltd	Deloitte	24/08/2010
Mosaic Oil NL	PwC	1/09/2010
Nullarbor Holdings Ltd	Hall Chadwick	7/09/2010
Prime Infrastructure Group	Grant Samuel	24/09/2010
Mako Energy Ltd	RSM Bird Cameron	8/10/2010
Intoll Group	Ernst & Young	14/10/2010
MAC Services Group Ltd [The]	Grant Samuel	9/11/2010
Copper Strike Ltd	RSM Bird Cameron	11/11/2010
Northern Energy Corporation Ltd	Lonergan Edwards	17/11/2010
Sigma Pharmaceuticals Ltd	Deloitte	3/12/2010
Dominion Mining Ltd	KPMG	9/12/2010
Engin Ltd	Lonergan Edwards	20/12/2010
Alinta Energy Group	Grant Samuel	1/02/2011
ING Industrial Fund	Deloitte	10/02/2011
White Energy Company Ltd	Deloitte	22/02/2011
Tower Australia Group Ltd	Lonergan Edwards	11/03/2011
RHG Ltd	Deloitte	16/03/2011
Rialto Energy Ltd	RSM Bird Cameron	18/03/2011
Mintails Ltd	Hall Chadwick	24/03/2011
Redflex Holdings Ltd	Lonergan Edwards	31/03/2011
Spark Infrastructure Group	Lonergan Edwards	13/04/2011
Gloucester Coal Ltd	Deloitte	1/05/2011
Copper Strike Ltd	RSM Bird Cameron	13/05/2011
Cellestis Ltd	Deloitte	1/06/2011
Engin Ltd	Lonergan Edwards	1/06/2011
Global Petroleum Ltd	BDO	28/06/2011
QMASTOR Ltd	BDO	1/07/2011
Centrebet International Ltd	Lonergan Edwards	8/07/2011
Qube Logistics	Deloitte	11/07/2011

Company Name	Independent Expert	Expert report date
ConnectEast Group	Deloitte	22/08/2011
Telstra Corporation Ltd	Grant Samuel	31/08/2011
Mikoh Corporation Ltd	RSM Bird Cameron	1/09/2011
Copper Strike Ltd	RSM Bird Cameron	6/09/2011
Northern Energy Corporation Ltd	Deloitte	19/09/2011
Eastern Star Gas Ltd	Grant Samuel	22/09/2011
Centro Properties Group	Grant Samuel	5/10/2011
Bondi Mining Ltd	InterFinancial	7/10/2011
Oceania Capital Partners Ltd	Deloitte	10/10/2011
Coal & Allied Industries Ltd	Lonergan Edwards	21/10/2011
Fosters Group Ltd	Grant Samuel	26/10/2011
Wentworth Holdings Ltd	Leadenhall	15/11/2011
Bow Energy Ltd	Grant Samuel	16/11/2011
Syngas Ltd	Grant Thornton	17/11/2011
Centro Retail Group	Grant Samuel	29/11/2011
AUSTAR United Communications Ltd	Grant Samuel	8/12/2011
Brockman Resources Ltd	Deloitte	14/12/2011
Living and Leisure Australia Group	Grant Thornton	20/12/2011
DoloMatrix International Ltd	Lonergan Edwards	22/12/2011
Murchison Metals Ltd	KPMG	23/12/2011
My Net Fone Ltd	Leadenhall	23/12/2011
KIP McGrath Education Centres Ltd	Crowe Horwath	5/01/2012
oOh!media Group Ltd	Grant Thornton	20/01/2012
Aston Resources Ltd	PwC	6/03/2012
CMI Ltd	Lonergan Edwards	29/03/2012
Ludowici Ltd	Grant Thornton	3/04/2012
ING Real Estate Community Living Group	Deloitte	24/04/2012
Gloucester Coal Ltd	Deloitte	26/04/2012
Nexbis Ltd	Grant Thornton	9/05/2012
Genesis Resources Ltd	RSM Bird Cameron	13/06/2012
Norton Gold Fields Ltd	Grant Thornton	13/07/2012
Spotless Group Ltd	Grant Samuel	15/07/2012
Hastings Diversified Utilities Fund	Grant Samuel	3/08/2012
Westgold Resources Ltd	BDO	16/08/2012
Arafura Resources Ltd	BDO	13/09/2012
Consolidated Media Holdings Ltd	KPMG	24/09/2012
Bremer Park Ltd	Moore Stephens	28/09/2012
DUET Group	Grant Samuel	3/10/2012
Total (reports)	**132**	

Appendix C Inferring the market cost of equity

Company Name	Independent Expert	Expert report date	Risk-free rate applied	Mid-point MRP	Diff. between applied and calculated Ke / discount rate[29]	Mid-point gearing	Implied market cost of equity[30]	AER implied market cost of equity - 20day average
			(A)	(B)	(C)	(D)	A+B+C/(1-D) [31]	
KIP McGrath Education Centres Ltd	Crowe Horwath	5/01/2012	4.91%	6.00%			10.9%	9.9%
oOh!media Group Ltd	Grant Thornton	20/01/2012	5.00%	6.00%			11.0%	10.0%
Aston Resources Ltd	PwC	6/03/2012	5.10%	6.00%			11.1%	9.8%
CMI Ltd	Lonergan Edwards	29/03/2012	4.50%	6.00%	0.90% (Ke)		11.4%	10.2%
Ludowici Ltd	Grant Thornton	3/04/2012	4.60%	6.00%			10.6%	10.0%
ING Real Estate Community Living Group	Deloitte	24/04/2012	3.92%	7.00%			10.9%	10.0%
Gloucester Coal Ltd	Deloitte	26/04/2012	4.44%	7.00%			11.4%	10.1%
Nexbis Ltd	Grant Thornton	9/05/2012	4.50%	6.00%			10.5%	10.2%
Genesis Resources Ltd	RSM Bird Cameron	13/06/2012	3.04%	6.50%			9.5%	9.1%
Norton Gold Fields Ltd	Grant Thornton	13/07/2012	4.00%	6.00%			10.0%	9.0%
Spotless Group Ltd	Grant Samuel	15/07/2012	3.00%	6.00%	0.30% (WACC)	25%	9.4%	9.0%
Hastings Diversified Utilities Fund	Grant Samuel	3/08/2012	3.00%	6.00%	1.70% (WACC)	50%	12.4%	8.9%
Westgold Resources Ltd	BDO	16/08/2012	3.18%	7.00%			10.2%	9.0%
Arafura Resources Ltd	BDO	13/09/2012	2.99%	7.00%			10.0%	9.2%
Consolidated Media Holdings Ltd	KPMG	24/09/2012	4.30%	6.00%			10.3%	9.2%
Bremer Park Ltd[32]	Moore Stephens	28/09/2012	3.30%	6.00%			9.3%	9.1%
DUET Group[33]	Grant Samuel	3/10/2012	3.00%	6.00%	3.2% (Ke)		12.2%	9.1%
Average							**10.7%**	**9.5%**

[29] Excluding rounding adjustments
[30] Except as noted in footnote 31, the adjusted market cost of equity is calculated as: risk free rate applied + mid-point MRP + difference between applied and calculated cost of equity or WACC. This is based on the approach outlined at paragraph 58.
[31] The gearing level is only relevant where there is a difference between the WACC applied by the expert and the WACC calculated based on the inputs selected. Where this occurs, the adjusted market cost of equity is calculated as: risk free rate applied + mid-point MRP + difference between applied and calculated cost of equity or WACC / (1 – mid-point gearing).
[32] This is the only report that takes the observed yield on 10 year Commonwealth Government Bonds and applies a market risk premium of 6.0% to imply its market cost of equity, and makes no other adjustment which can be attributed to the implied market cost of equity. However, it does include a specific risk premium of 9.0-14.0% in calculating the cost of equity.
[33] Grant Samuel appears to have applied a cost of equity of 11.0% instead of using the calculated cost of equity of 7.8% when determining the WACC (i.e. a difference of 3.2 percentage points). It also appears to make further upward adjustments for the cost of debt, gearing (and potentially for the cost of equity or tax) in arriving at its discount rate.

Appendix D How independent experts apply the CAPM

1. My observations on how independent experts apply the CAPM to estimate the total cost of equity is drawn from the independent expert reports in Appendix B.

2. Independent experts focus on establishing their best estimate of the cost of equity that the market would expect for the asset at a point in time.

3. In applying the CAPM to estimate the cost of equity in the Australian market independent experts as a starting point commonly:

    a. Estimate the risk free rate based on the yield on a long term (typically 10 years for Australian assets) Commonwealth Government bond observed as at the valuation date (or in the immediate period preceding it).

    b. Apply a value for the market risk premium that is consistent over time, with 6% being the minimum and most commonly applied point estimate.

    c. Select a value for beta that is, where sufficient information is available, consistent with the observed range for beta and gearing levels of comparable publicly listed companies.

4. It is also apparent that most independent experts consider the CAPM as a tool which provides guidance to derive the appropriate cost of equity and discount rate. This is evident from how the discount rate and, the cost of equity in particular, are defined and estimated. For example:

    a. The discount rate and the cost of equity are often defined as a range as opposed to a point estimate to avoid spurious precision. There is also generally more uncertainty (and hence, room for estimation error) associated with estimating a value for each component of the cost of equity compared to the cost of debt.

    b. Independent experts consider a range of factors in their selection of parameter values to achieve the key objective, including the reliability of the data they observe and the degree to which the data is consistent with their knowledge of the asset they are valuing.

    As a result, independent experts modify their application of the CAPM to ensure that it yields costs of equity and / or discount rates which are consistent with market expectations.

Appendix E My curriculum vitae

Craig Mickle
Partner, Economics, Regulation and Policy

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Experience

Craig has about 20 years experience in providing strategic advice and economic analysis in the infrastructure sector. Craig has provided policy and regulatory due diligence or advice on a large number of infrastructure asset transactions and has particular experience on issues associated with assessing risk and returns for a wide variety of industries.

Relevant experience

Client	Value to client
Infrastructure asset transactions	Provided policy and regulatory due diligence (VDD and buy side) or advice on numerous infrastructure asset transactions, including: ► The sale of the Port Botany and Port Kembla (current) ► Expression of Interest for the Abbott Point Coal Terminal T4-T7 ► Sale of the Abbott Point Coal Terminal X50 ► APA Group – sale of assets to the Energy Investment Trust ► Spark Infrastructure – strategic review ► Sydney Water – preparing for the sale of the desalination plant ► Queensland Government - Sale of Queensland Rail ► North Queensland Gas Pipeline ► Spark Infrastructure – UK water asset due diligence ► Origin Energy Networks ► Allgas ► Murraylink ► Duke Energy's Australasian energy assets ► DUET Group on several acquisitions opportunities ► SP AusNet on its IPO ► AMP Henderson/Alinta on the acquisition/ownership reorganisation of United Energy, Multinet and AlintaGas ► CitiPower ► The sale of several energy retailers (various) ► The sale of various renewable energy assets
Infrastructure investor	Currently providing advice on issues associated with the potential acquisition of infrastructure assets in the water industry, including rate of return issues
Private equity	Currently leading work assessing the returns that may be available from direct investment in Australian agriculture
Infrastructure Investor	Assessed the relationship between required returns and the various types of assets it is invested in, or is proposing to invest in, including regulated assets.
Confidential	Assessed the potential issues associated with the estimation of the Maximum Reserve Capacity Price in the Western Australian Wholesale Electricity Market, including the cost of capital

Confidential	Led a "market testing" project on a government owned superannuation business. This included assessing the returns it is earning and benchmarking what it ought to be earning.
Confidential	Led a "market testing" project on a government owned project management business. This included assessing the returns it is earning and benchmarking what it ought to be earning.
Confidential	Led a "market testing" project on a government owned registry business. This included assessing the returns it is earning and benchmarking what it ought to be earning.
Various resource companies	Advised on rate of return aspects of the application of the Minerals Resource Rent Tax in respect of downstream infrastructure.
Infrastructure industries	Craig regularly advises a wide range of businesses in infrastructure sectors that are either subject to regulation or to the risk of regulation in relation to cost of capital, risk and a range of other related issues (e.g. pricing)
Financial Investor Group	Advised the eight major energy asset owners in Australia (APA Group, Brookfield, CKI, DUET, Hastings Funds Management, Hong Kong Electric, Singapore Power, Spark Infrastructure) on the AER's first review of the cost of capital to apply to regulated energy network businesses, particularly in light of the Global Financial Crisis.
NSW Department of Treasury and Finance	Advised on the preparation of NSW Lotteries for privatization including addressing issues of the appropriate rates of return.
Fosters Group	Advised on the assumptions underpinning valuation of certain hotel assets in respect of the application of new taxes applying to gaming machines.
NSW Crown Lands	Led a review of the rate of return component of a rental formula previously set by IPART, which is applied in establishing licence fees for domestic waterfront tenancies located on Crown Land

Qualifications

- Bachelor of Business, Curtin University, Western Australia
- Diploma in Applied Finance and Investment, FINSIA
- MBA (Hons) Middlesex University Business School, London UK

Appendix F My instructions

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Our Ref: A8059
Your Ref:
Doc ID: 62661661.1

5 November 2012

Mr Craig Mickle
Partner
Ernst & Young
Level 33, Ernst & Young Centre
World Square, 680 George Street
SYDNEY NSW 2000

BY EMAIL

Dear Sir

Victorian Gas Access Arrangement Review 2013-2017: Envestra, Multinet and SP AusNet

We act for Envestra Limited (**Envestra**), Multinet Gas (DB No. 1) Pty Ltd and Multinet Gas (DB No. 2) Pty Ltd (together, **Multinet**) and SPI Networks (Gas) Pty Ltd (**SP AusNet**) in relation to the Australian Energy Regulator's (**AER**) review of each of the Gas Access Arrangements for Victoria.

Envestra, Multinet and SP AusNet as well as APA GasNet (Operations) Australia Pty Ld (together the **Gas Businesses**) wish to jointly engage you to prepare an expert report in connection with the AER's review of the Victorian Gas Access Arrangements. The report will also be used by Envestra for the AER's review of Envestra's Access Arrangement for its Albury Distribution Network.

This letter sets out the matters which the Gas Businesses wish you to address in your report and the requirements with which the report must comply.

Terms of Reference

The terms and conditions upon which each of the Gas Businesses provides access to their respective networks are subject to five yearly reviews by the AER.

The AER undertakes that review by considering the terms and conditions proposed by each of the Gas Businesses against criteria set out in the *National Gas Law* and *National Gas Rules*.

Rule 76 of the *National Gas Rules* provides that the Gas Businesses' total revenue for each regulatory year is to be determined using the building block approach, in which one of the building blocks is a return on the projected capital base for the year.

Rule 87(1) provides that the rate of return on capital is to be commensurate with prevailing conditions in the market for funds and the risks involved in providing reference services. Rule 87(2) provides that a well accepted approach incorporating the cost of equity and debt (such as the Weighted Average Cost of Capital (**WACC**)) is to be used along with a well accepted financial model (such as the Capital Asset Pricing Model (**CAPM**)) in determining the rate of return on capital.

The Gas Businesses are seeking expert assistance in respect of their proposed estimates of the cost of equity to be used in the calculation of the WACC (through the CAPM) and the approach of the AER in the Draft Decisions recently published for each of the Gas Businesses.

In this context the Gas Businesses wish to engage you to prepare an expert report which contains:

(a) your opinion on the best market evidence available to assess the prevailing cost of equity in the market for funds in Australia;

(b) an analysis of the available evidence including your opinion on the estimated prevailing cost of equity that can be drawn from that evidence;

(c) based on your analysis above, your opinion as to whether the cost of equity estimated by the AER in the Draft Decisions for the Gas Businesses, meets the requirement of Rule 87(1) of the *National Gas Rules* that it be commensurate with prevailing conditions in the market for funds and the risks involved in providing reference services; and

(d) based on your analysis above, your opinion as to whether the cost of equity proposed by the Gas Businesses in response to the Draft Decision meets the requirement of Rule 87(1) of the *National Gas Rules* that it be commensurate with prevailing conditions in the market for funds and the risks involved in providing reference services.

Use of Report

It is intended that your report will be included by each of the Gas Businesses in their respective responses to the AER's Draft Decisions in respect of their access arrangement revision proposals for their Victorian networks (and in the case of Envestra, Albury network) for the access arrangement period from 1 January 2013 to 31 December 2017. The report may be provided by the AER to its own advisers. The report must be expressed so that it may be relied upon both by the Gas Businesses and by the AER.

The AER may ask queries in respect of the report and you will be required to assist each of the Gas Businesses in answering these queries. The AER may choose to interview you and if so, you will be required to participate in any such interviews.

The report will be reviewed by the Gas Businesses' legal advisers and will be used by them to provide legal advice to the Gas Businesses as to their respective rights and obligations under

the *National Gas Law* and *National Gas Rules*. You will be required to work with these legal advisers and the Gas Businesses' personnel to assist them to prepare the Gas Businesses' respective responses to the Draft Decisions and submissions in response to the Final Decisions made by the AER.

If any of the Gas Businesses choose to challenge any decision made by the AER, that appeal will be made to the Australian Competition Tribunal and the report will be considered by the Tribunal. The Gas Businesses may also seek review by a court and the report would be subject to consideration by such court. You should therefore be conscious that the report may be used in the resolution of a dispute between the AER and any or all of the Gas Businesses as to the appropriate level of the respective Distributor's distribution tariffs. Due to this, the report will need to comply with the Federal Court requirements for expert reports, which are outlined below.

You must ensure you are available to assist the Gas Businesses until such time as the Access Arrangement Review and any subsequent appeal is finalised.

Timeframe

The AER's Draft Decisions in respect of the Gas Businesses' respective access arrangement revision proposals have now been released. The Gas Businesses will then have until 9 November 2012 to respond to the Draft Decisions (including the provision of any expert reports).

Compliance with the Code of Conduct for Expert Witnesses

Attached is a copy of the Federal Court's Practice Note CM 7, entitled "*Expert Witnesses in Proceedings in the Federal Court of Australia*", which comprises the guidelines for expert witnesses in the Federal Court of Australia (**Expert Witness Guidelines**).

Please read and familiarise yourself with the Expert Witness Guidelines and comply with them at all times in the course of your engagement by the Gas Businesses.

In particular, your report prepared for the Gas Businesses should contain a statement at the beginning of the report to the effect that the author of the report has read, understood and complied with the Expert Witness Guidelines.

Your report must also:

1 contain particulars of the training, study or experience by which the expert has acquired specialised knowledge;

2 identify the questions that the expert has been asked to address;

3 set out separately each of the factual findings or assumptions on which the expert's opinion is based;

4 set out each of the expert's opinions separately from the factual findings or assumptions;

5 set out the reasons for each of the expert's opinions; and

6 otherwise comply with the Expert Witness Guidelines.

The expert is also required to state that each of the expert's opinions is wholly or substantially based on the expert's specialised knowledge.

It is also a requirement that the report be signed by the expert and include a declaration that "*[the expert] has made all the inquiries that [the expert] believes are desirable and appropriate and that no matters of significance that [the expert] regards as relevant have, to [the expert's] knowledge, been withheld from the report*".

Please also attach a copy of these terms of reference to the report.

Terms of Engagement

Your contract for the provision of the report will be directly with the Gas Businesses. You should forward to each of the Gas Businesses any terms you propose govern that contract as well as your fee proposal.

Please sign a counterpart of this letter and forward it to each of the Gas Businesses to confirm your acceptance of the engagement by the Gas Businesses.

Yours faithfully

Johnson Winter & Slattery

Enc: Federal Court of Australia Practice Note CM 7, "Expert Witnesses in Proceedings in the Federal Court of Australia"

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Signed and acknowledged by Craig Mickle

Date ……..