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Response to AER Vic gas draft decisions

INTERNAL CONSISTENCY OF MRP AND RISK FREE RATE

November 2012

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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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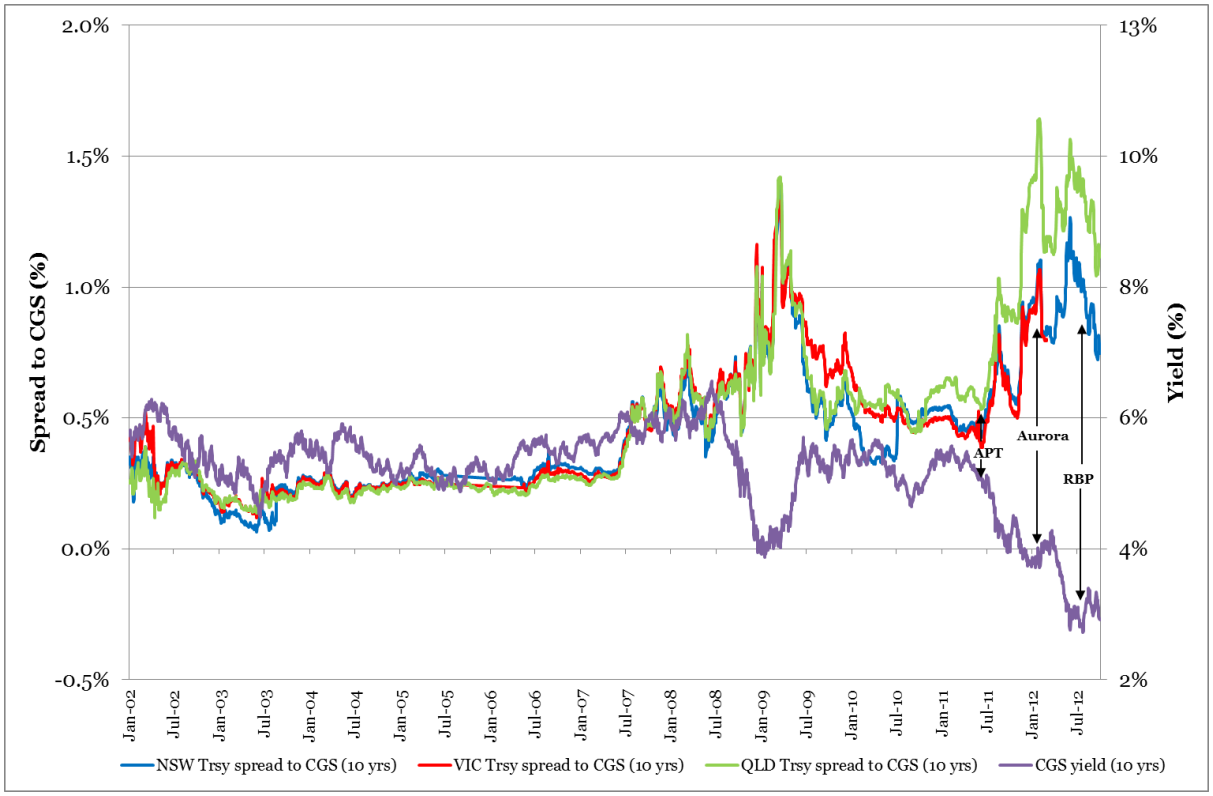
To conclude, five years on we are still in a world where risk aversion is high and some parts of the financial system seem dysfunctional. In some countries – though not Australia, I believe – the supply of credit is tighter than the underlying risks would require. I hope I won't come back in five years' 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.

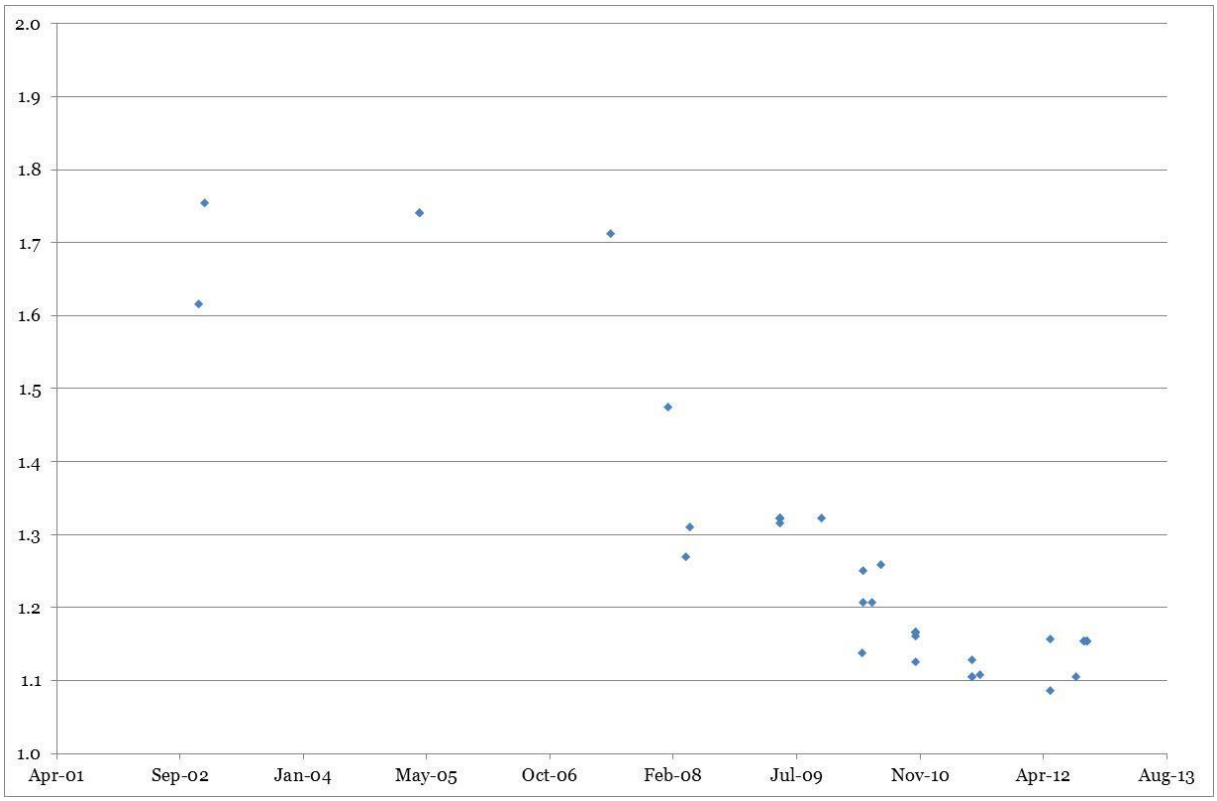
51 See section 4 of my March report.

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

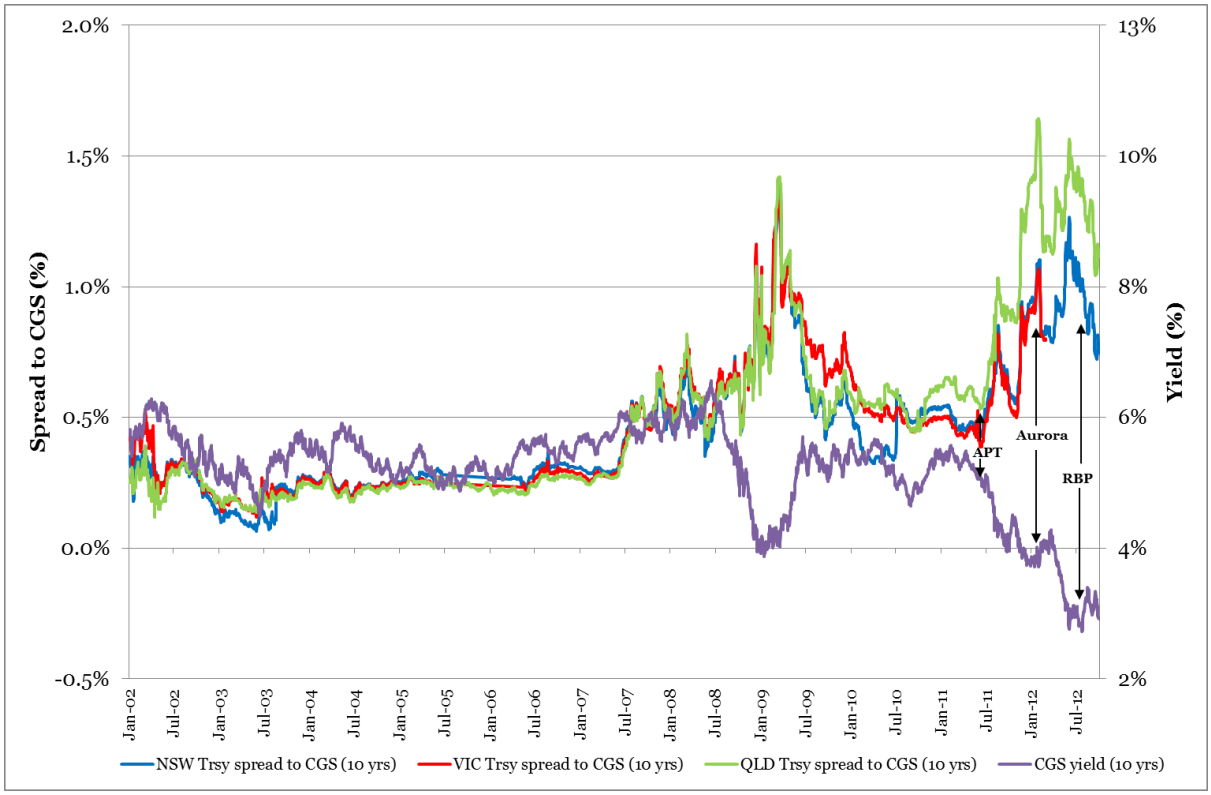
$$DRP = MRP\ \beta_d + DF + LIQ$$

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

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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"

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Signed and acknowledged by Tom Hird

Date ……..