

Forward looking estimates of the equity premium

For regulated businesses and the market as a whole A report for the JIA

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Executive Summary

Role of DGM analysis

1. In our previous report we performed a dividend growth model (DGM) analysis of the return on equity required by investors in Australian and US regulated energy businesses.¹ This analysis requires the estimation of a market discount rate that equates observed market equity prices with forecasts of expected future dividends. DGM analysis provides a forward looking estimate of the prevailing cost of equity as required by 6.5.4(e)(1) of the NER:

"the need for the rate of return calculated for the purposes of clause 6.5.2(b) to be a forward looking rate of return that is commensurate with prevailing conditions in the market for funds and the risk involved in providing standard control services"

- 2. A DGM analysis provides a direct estimate of investors' forward looking required return. In contrast, theoretical application of the capital asset pricing model (CAPM) using parameters that are estimated based on historical data provides an indirect estimate of the forward looking required return. Such a theoretical approach is only as good as the assumptions underlying the theoretical model and the input assumptions used in implementing that model (which cannot be presumed to be forward looking if they are based on historical data).
- 3. The DGM is routinely used by academics and practitioners, and provides the necessary confidence that theoretically generated estimates (eg, through a particular implementation of the CAPM) are representative of investor requirements. Moreover, where there is a substantial disagreement between the DGM results and results based on a particular theoretical model then one should give significant weight to the DGM results. This is true unless the person implementing the theoretical model is confident that their model and implementation is "right" and that the market is "wrong". This is a position that economic regulators should be loathe to take.

Results of DGM analysis

4. Our original report was based on analysts' dividend forecasts and utility equity prices in June and July of 2008. In that report we restricted our analysis to the six Australian listed firms who derive a majority of their revenues from regulated energy assets. We examined whether the implied cost of equity was below the

¹ CEG, An analysis of the implied market cost of equity for Australia regulated utilities, 14 September 2008 (our 'original report').



cost of equity derived from application of the NER (then 12.45%) such that this would support a decision to reduce the NER cost of equity in the current review.

- 5. We concluded that it was more likely that the opposite was true. We found that to arrive at an implied cost of equity of 12.45% one would have to assume that real dividends for these firms would fall at a rate of 4.5% beyond the period of analysts' forecasts. We concluded that this was unlikely and that a more reasonable assumption was growth in line with inflation in which case the implied cost of equity was 15.4% (1.9% above the NER cost of equity).
- 6. In this report we update this analysis. According to more recent evidence there has been an increase in the cost of equity for utilities, whilst there has been a reduction in the NER cost of capital (due to falls in government bond yields and the AER's proposal to reduce the NER equity beta and increase gamma). In November 2008 it was the case that, assuming dividends grow in line with inflation beyond the forecast period, the implied cost of equity for the same utilities analysed in our first report had increased to 17.2% whilst the NER cost of equity (based on the draft decision proposal) is 9.7%.
- 7. The magnitude of this difference makes the high level result insensitive to the forecast of future dividends.² That is, for any reasonable set of assumptions it is, in our view, simply not possible to conclude that the forward looking cost of equity for utilities was lower than the NER cost of equity (adjusted for the AER's proposed changes to the NER) in November 2008.
- 8. A comparison of the implied forward looking cost of equity for our sample of utilities with the NER cost of equity is provided in the figure below (assuming long run dividends are expected to grow in line with inflation at 2.5%).

² We now find that, in order for the November 2008 forward looking implied cost of equity to be equal to the NER cost of equity associated with implementing the AER's proposals, the rate of dividend reductions beyond the analyst forecast period (beyond 2013) must be 13.5%pa in perpetuity (15% real at an inflation rate of 2.5%). For this to be true investors must be expecting dividends to fall by 80% ((1-0.15)¹⁰ -1 = 0.8.





Figure 1: DGM vs NER implied cost of equity for utilities December 2005 to December 2008

Source: CEG analysis – see Appendix C

9. In this report we perform a similar DGM analysis of the cost of equity for the Australian market as a whole. In doing so we adopt a method employed by AMP Capital Investors which the draft decision cites (although the citation relates to a 2006 application of the method). Consistent with our utility specific analysis this finds a corroborating significant increase in the cost of equity in the last six months. The figure below illustrates the recent changes in both the implied cost of equity for the market as a whole and the NER cost of capital.







Source: RBA data, CEG analysis

- 10. This figure illustrates the combined effect of historically unprecedented low CGS yields in December 2008 and the proposed changes to the NER parameters in the AER's draft decision on the regulated return on equity.³ It contrasts this with an estimate of the average return on equity actually required by investors in the equity market today.
- 11. We perform sensitivity analysis for the assumptions underlying the above graph. We find that, to be consistent with the AER's proposed parameters, investors must be expecting aggregate dividends to more than halve in 2009 and stay at that low level for 3 years and only ever return to 2008 levels in 2035. In our opinion this is not a reasonable assumption.
- 12. The important conclusion of both sets of analysis (utility specific and the market as a whole) is that the AER draft decision comes at a time when:

³ AER, *Review of the weighted average cost of capital (WACC) parameters: Explanatory statement*, December 2008 ('draft decision').



- the NER formula is already giving an historically low return to equity investors (due to the historically low CGS yield); and
- the actual cost of equity in the market for funds is at historically high levels.
- 13. The consequence of the AER's draft decision, if implemented, would be to materially widen this already significant gap.

Treatment of our results in the draft decision

14. The draft decision concludes its three page discussion of our original report by stating:⁴

"CEG's DGM analysis has not provided persuasive evidence that the cost of equity following the current NER transmission WACC parameters is less than the market's implied required rate of return on equity for Australian energy utilities."

- 15. This appears to be the end of the consideration of our results in the draft decision. However, a finding that these results do not provide persuasive evidence for change in one direction does not, in our view, mean that the results should be ignored when imposing a change in the opposite direction. In our view it would be equally relevant to compare the weight of evidence for movements in either direction and to determine on the basis of this evidence whether persuasive evidence exists for a change.
- 16. This extraordinarily high barrier applied in the draft decision is reflected in the question that Associate Professor Handley was asked by the AER when reviewing CEG's analysis. Namely, the question asks whether the CEG analysis:⁵

...conclusively demonstrates the case that the implied cost of equity is higher than the cost of equity that would be derived from the National Electricity Rules. [Emphasis added.]

17. In our view, the AER does not provide an economically sensible basis for not giving our findings weight in its draft decision. Indeed, the substantive reasons that the AER does provide apply equally, or with more force, to its own analysis. We note that the AER sought the views of Associate Professor Handley, however, Handley's discussion of our report is very brief (five paragraphs) and

⁴ Draft decision, p.251

⁵ Handley, J., *Comments on the CEG reports*, 20 November 2008 ('Handley')



does not go into detail. Handley simply states that: 1) the results of DGM analysis are sensitive to its assumptions; and 2) if forecast dividends are unsustainably high relative to free cashflow then the DGM analysis will overestimate the cost of equity. These do not amount to substantive criticisms of our DGM analysis. Despite this, the draft decision relies on Handley when it states:⁶

"The AER agrees with the analysis by Handley (2008) that the DGM should be used with much caution, due to the high sensitivity in outcomes to small changes in inputs, and the lack of corroborating information provided by CEG, such as free cash flow forecasts, on the distribution forecasts."

- 18. In response, we note that DGM is no more sensitive to changes in assumptions than the particular implementation of the Sharpe CAPM which the draft decision adopts. As noted above, this approach is sensitive to both the assumptions about inputs and, importantly, sensitive to the critical assumption that the underlying theoretical model accurately describes reality. In this context it is wrong of the AER to dismiss the relevance of DGM analysis, especially given that:
 - there is no consensus in the finance literature that the Sharpe CAPM is the correct model; and
 - there is consensus in the finance literature (and the AER is advised of this by Handley) that even if the Sharpe CAPM is the correct model the AER's implementation of the Sharpe CAPM (based on equity betas estimated from the stock market) has flaws.⁷
- 19. Relevantly, the draft decision separately relies on the results of DGM analysis by Davis (1998), Lally (2002) and AMP (2006) when determining that the MRP should be set below the historical average excess return.⁸ These results are equally subject to "*high sensitivity in outcomes to small changes in inputs*" so it is unclear why the AER would use this as a basis to disregard the results of our study whilst relying on those of other earlier studies.

⁶ Draft decision, p.249

⁷ See CEG, Estimating the NER equity beta based on stock market data – a response to the AER draft decision. January 2009. In summary, the AER's method for estimating the cost of equity has been repeatedly tested using equity market data and found to be both inaccurate and biased. Handley confirms that this is so. Handley notes that there are two explanations: one that the underlying theoretical model (the Sharpe CAPM) is wrong and the other that the implementation of this is wrong because equity betas cannot be accurately estimated from stock market data. Either way, the AER's basis for decision-making has the potential for significant error.

⁸ Draft decision, p.172



- 20. We also dispute the basis for finding that the results of our initial study were sensitive to small changes in inputs (and we describe below why Handley did not show this to be true). In any event, and as described above, the results of the update of that study are demonstrably not sensitive to changes in input assumptions.
- 21. We also note that Handley's commentary regarding free cash-flow is misguided. In this report we are not attempting to value the relevant firms or to estimate the return *CEG* expects investors to receive. We are attempting to estimate the return *investors* expect to receive. We are doing so using analysts' forecasts of dividend growth as a proxy for the market's forecast of dividend growth. We naturally and appropriately assume that analysts' dividend forecasts are based on a forecast of underlying profits but we do not attempt to second guess analysts. CEG could amend analysts' forecasts based on our own view of underlying profits but this would constitute a CEG forecast which would be inconsistent with the purpose of the study.
- 22. The draft decision raises other alleged weaknesses in our analysis that are not based on Handley's report. In all respects these are either erroneous or inconsequential in terms of the interpretation of our report. These are discussed further below.
- 23. Finally, and notwithstanding the commentary from the AER and Handley, our updated DGM analysis does provide persuasive evidence that, in late 2008, the cost of equity following the current NER transmission WACC parameters is less than the market's implied required rate of return on equity for Australian energy utilities.

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1. Introduction

1.1. Terms of reference

- 24. In December 2008, the AER released its explanatory statement of its draft decision in relation to the review of National Electricity Rules (NER) weighted average cost of capital (WACC) parameters. CEG has been asked by the Joint Industry Associations (JIA) to provide a review of the explanatory statement to the extent that it deals with, or does not deal with, the use of forward looking estimates of the cost of equity.
- 25. This includes a review of the AER's, and its consultant's, consideration of our previous report *An analysis of implied market cost of equity for Australian regulated utilities*, dated 14 September 2008. We have been asked to update this report with more recent market data and to provide appropriate commentary on the draft decision. We have also been asked to include an analysis of the estimation of the forward looking cost of equity for the market as a whole an issue not addressed in our previous report.
- 26. In our previous report we performed a dividend growth model (DGM) analysis of the return on equity required by investors in Australian and US regulated energy businesses. This analysis requires the estimation of a market discount rate that equates observed market equity prices with forecasts of expected future dividends. It was intended that this analysis would shed light on whether the current methodology for setting the cost equity in the National Electricity Rules (NER) for electricity transmission is consistent with the cost of equity actually observed in equity markets. In doing so our report represented a "market based" cross check on the more theoretical methods used to assess cost of equity.
- 27. The DGM is routinely used by academics and practitioners, and provides the necessary confidence that theoretically generated estimates (eg, through a particular implementation of the CAPM) is representative of investor requirements. Moreover, where there is a substantial disagreement between the DGM results and results based on a particular theoretical model then the DGM results should be given a strong weight. This should always be true unless the person implementing the theoretical model is confident that it is right and that the market is wrong.
- 28. DGM analysis provides a forward looking estimate of the cost of equity commensurate with prevailing conditions on the markets and that this is consistent with the NER and the AERs terms of reference for the WACC review. Specifically, the DGM analysis provides a forward looking estimate of the prevailing cost of equity. We understand this to be relevant under the NER which states at 6.5.4(e)(1) of the NER:



"the need for the rate of return calculated for the purposes of clause 6.5.2(b) to be a forward looking rate of return that is commensurate with prevailing conditions in the market for funds and the risk involved in providing standard control services"

29. A DGM analysis provides a direct estimate of this. This compares with a theoretical application of the capital asset pricing model using parameters that are estimated based on historical data. This method provides an indirect estimate of the cost of equity which is only as good as the assumptions underlying the theoretical model and the input assumptions used in implementing that model. Moreover, to the extent that the assumptions of that model are based on historical analysis (eg, of the average historical market risk premium) then the outputs of this model cannot be presumed to be *forward looking* or *commensurate with prevailing conditions in the market for funds.*

1.2. Structure of report

- 30. The remainder of this report has the following structure:
 - Section 2 provides a comparison of the results from our last report with the update of those results for new market data (on dividend forecasts and equity prices);
 - Section 3 provides an analysis of the cost of equity (and market risk premium (MRP)) for the stock market as a whole;
 - Section 4 provides a discussion of the AER draft decision including in the context of our updated results;
 - Section 5 provides the conclusions of this report;
 - Appendix A largely repeats section 2 from our previous report, and sets out the conceptual basis for estimating the implied required return from current stock prices and forecasts of earnings. This section need not be read again if the reader is familiar with the description of methodology in that report; and
 - Appendix B provides a full disclosure of the data underlying our forecasts and other data used in this report.



2. Update of DGM data for regulated businesses

2.1. Stock selection and dividend forecasts to 2012

- 31. As with our previous study, the businesses included in the study are the six that rely primarily on revenue from regulated gas or electricity infrastructure services.⁹ In our past study we used mean of analysts' expected dividends per share for the second half of calendar year 2008 out to 2012 which we sourced from Bloomberg. In this update we use the mean of analysts' expected dividends per share for the first half of calendar year 2009 out to 2013.
- 32. For each firm the old (previous study) and updated dividend per share forecasts and share prices are listed in Table 1 below.

	Equity prices**	Dividends 2008	Dividends 2009	Dividends 2010	Dividends 2011	Dividends 2012	Dividends 2013
	Update	Update	Update	Update	Update	Update	Update
Aust Pipeline Trust	2.93	NA	0.310	0.328	0.339	0.353	0.370
DUET	2.20	NA	0.284	0.297	0.312	0.323	0.337
Envestra Limited	0.57	NA	0.080	0.080	0.080	0.082	0.084
SP AusNet	1.10	NA	0.120	0.120	0.122	0.130	0.130
Spark Infra. Group	1.47	NA	0.190	0.194	0.200	0.210	
Hastings Div Utils	2.30	NA	0.290	0.300	0.310	0.325	0.325
Sum update	10.57	0	1.274	1.319	1.363	1.423	NA***
	Old	Old	Old	Old	Old	Old	Old
Aust Pipeline Trust	2.82	0.290	0.308	0.321	0.338	0.350	NA
DUET	3.03	0.271	0.284	0.300	0.313	0.325	NA
Envestra Limited	0.72	0.096	0.096	0.096	0.095	0.099	NA
SP AusNet	1.14	0.120	0.120	0.120	0.125	0.130	NA
Spark Infra. Group	1.68	0.190	0.191	0.196	0.203	0.213	NA
Hastings Div Utils	2.28	0.280	0.290	0.300	0.310	0.330	NA
Sum old	11.67	1.247	1.289	1.333	1.384	1.447	NA

Table 1: Cash dividend* per share forecasts for potential comparables

* Dividends include all distributions. This includes distributions categorised as interest and repayment of debt where that debt is stapled to equity (ie, cannot be traded separately to the underlying equity)

**Average \$/share closing price in on in June and July 2008 (previous study) November 2008 (updated study).

***Spark distributions not forecast to 2013.

⁹ In this context we include gas pipeline assets that have a large part, or all, of their sales under long term contracts but where those contracts are negotiated in the knowledge of actual or potential regulated tariffs.



- 33. It can be seen that since our last study the aggregate share price for the companies has fallen by around 9.5% (10.57/11.67 1). However, the level of expected future share prices is consistently higher in all the comparable years (ie, 2009 in the updated study is higher than 2008 in the old study etc). One might therefore expect the estimated cost of equity to rise (lower share prices and higher dividends imply a higher discount rate).
- 34. We note that since these dividend forecasts were sourced in November 2008 Envestra advised the market (in late December 2008) that its dividend payments would be reduced to 5.5 cents per share for the foreseeable future (a 31% reduction relative to forecasts of 8 cents per share). However, Envestra's share price is currently 32 cents¹⁰ which is a 44% reduction relative to the average price in November. Thus, despite these near term forecasts being overoptimistic this overoptimism appears to have been more than fully reflected in an overoptimistic share price. That is, taking a later date after Envestrsa's announcement would likely increase rather than decrease the implied cost of capital.
- 35. As noted in our previous report, the dividends in the above table are cash dividends and do not include any value placed on imputation credits. This means that they must be scaled up by the value of imputation credits if the DGM analysis is to provide a discount rate comparable to the NER discount rate (which includes a value placed on dividends).¹¹
- 36. In our previous report we scaled up cash dividends based on the assumption that for every \$0.70 of cash dividends there is \$0.15 of tax benefits to shareholders and, therefore, cash dividends must be multiplied by a factor of (1+ 0.3*0.5/0.7) = 1.21. This was consistent with the NER gamma of 0.5. In the AER draft decision it is proposed that the value of gamma be increased to 0.65. In which case, in order to make a meaningful comparison with the AER draft decision cost of equity we also adopt a value of 0.65 for gamma when reporting updated results. This means we must scale up cash dividends by a factor of (1+ 0.3*0.65/0.7) = 1.28

2.2. Discounted value of dividends

37. In our previous study we estimated the present value of discounted dividends using a NER discount rate of 12.45%. This was consistent with the discount rate currently prescribed in the NER for transmission and is calculated as follows:

¹⁰ As at 23 January 2009.

¹¹ As noted in our original report, the regulatory WACC is a vanilla WACC, which is not adjusted for gamma in the sense that there is no adjustment to remove the value of imputation credits. That is, the regulatory cost of equity is the total compensation for equity from which the operation of the PTRM removes the value of imputation credits by only allowing 1-gamma of tax costs to be recovered. The dividends we rely on are cash dividends that do not have the value of imputation credits included and so, to be comparable with the regulatory cost of equity, we must add these in.



- on 30 June 2008 the ten year CGS yield was 6.45%;
- add to this an equity premium of 6% (based on an NER equity beta of 1.0 and an NER MRP of 6%). This gives a cost of equity equal to 12.45%.
- 38. In the updated study we use the NER discount rate that would result from implementing the AER draft decision. This gives us a discount rate of 9.38%, which is more than 3% lower than 12.45% because:
 - the AER proposes to reduce the equity premium above CGS by 1.2% (from 6.0% to 4.8% reflecting an equity beta of 0.8 instead of 1.0); and
 - the CGS yield itself has fallen from 6.45% to average 4.58% in November 2008 – and would be lower still using December 2008 or January 2009.¹²
- 39. As before, it is appropriate to adopt a range for the forecast of dividend growth beyond 2012. The range examined in our previous report was from 5.5% to negative 2% (or around 3% real to negative 4.5% real assuming a 2.5% inflation rate). In this report we examine a more negative range extending the negative forecast of dividends to -17.1%. The reason we do this is not because there is any evidence the market actually expects this. Rather, this is the rate of dividend growth beyond 2013 that the market would have to be expecting in order for the proposed NER discount rate of 9.38% to be consistent with current equity prices.
- 40. Table 2 provides the results of our updated analysis.

¹² Here we use the month of November 2008 because the majority of the dividend forecasts were made in this month and hence it is relevant to use CGS yields over the same period. This is one month prior to the release of the AER's draft decision, and in the intervening period CGS yields have fallen considerably so that the NER discount rate would be lower still.



Firms	Average equity prices (\$/share) November 2008	Implied value of equity (\$/share) using NER assumed cost of equity of 9.38%% and assumed nominal dividends growth rate post 2013 of:				
		Inflation (2.5%)	Zero (0.0%)	Negative 5%	Negative 17.1%	
Aust Pipeline Trust	2.93	6.09	4.85	3.67	2.66	
DUET	2.20	5.55	4.43	3.35	2.43	
Envestra Limited	0.57	1.40	1.12	0.86	0.63	
SP AusNet	1.10	5.41	4.33	3.29	2.40	
Spark Infrast. Grp	1.47	2.17	1.73	1.32	0.96	
Hastings Div Utils	2.30	3.55	2.78	2.05	1.42	
Average	1.76	4.03	3.21	2.42	1.75	
Firms	Average equity prices (\$/share) June and July	Implied value of equity (\$/share) using NER equity of 12.45% and assumed nominal divid post 2012 of:			assumed cost of ends growth rate	
	2008	Inflation (2.5%)	Zero (0.0%)	Negative 1%	Negative 2%	
Aust Pipeline Trust	2.82	3.60	3.09	2.94	2.81	
DUET	3.03	3.34	2.87	2.73	2.61	
Envestra Limited	0.72	1.04	0.90	0.85	0.82	
SP AusNet	1.14	1.35	1.16	1.11	1.06	
Spark Infrast. Grp	1.68	2.20	1.89	1.80	1.72	
Hastings Div Utils	2.28	3.39	2.91	2.77	2.65	

Table 2: Market value of equity versus equity value that would exist if NER assumptions were held by investors

Source: CEG Analysis

- 41. The way to interpret this table is to compare the first column of figures (observed equity prices) with each of the columns to the right (which show the implied value of equity using the NER discount rate and a given assumption about dividend growth).
- 42. In our earlier report we noted that if investors really do discount dividends from regulated businesses at the NER cost of equity (then 12.45%) then the only explanation for share prices amongst our sample averaging \$1.95 per share (bottom of first column of figures) is that investors expect the average dividend to fall at an average rate of negative 2% after the end of the forecast period (noting that this is associated with a negative 4.5% real reduction in dividends at inflation of 2.5%). For any lower rate of reduction in dividends the share price at the NER discount rate should be above this level.
- 43. When we repeat this analysis using November data and testing against the NER cost of equity if the AER draft decision were implemented, we find that now investors would have to expect dividends to fall at 17.1% for their expectations to be consistent with the AER draft decision.



- 44. In simple mathematical terms, the growth rate in dividends beyond the forecast period is the equilibrating term. For given market equity prices and Bloomberg dividend forecasts within the period, in order to make current share prices consistent with the NER cost of equity we must reduce dividends beyond the forecast period at a given rate.
- 45. The reason this rate has fallen from -2% to -17% is due to the fact that the NER cost of equity we are testing has fallen since our previous study (due to AER proposed parameter value changes and falls in the CGS yields), dividend forecasts have not fallen (indeed, they have risen slightly) and share prices have fallen. As a consequence, dividends beyond the forecast period must be assumed to fall even faster than before in order to make the new lower NER cost of equity (which should raise share prices at constant dividends) consistent with the now even lower share prices.¹³
- 46. Of course, an alternative (and more likely) explanation is that the NER cost of equity is significantly below investors' actual cost of equity. That is, current share prices are best explained not by the assumption that dividends will fall at 17.1% forever after 2013 but rather, that the cost of equity is above 9.38%.

Conclusion

One of the following propositions must be correct:

- investors in the portfolio of regulated utilities expect average dividends to fall by 17.1% beyond 2013; or
- implementation of the draft decision WACC parameters in November 2008 would have substantially underestimated the then prevailing cost of equity.

In our view the second conclusion is demonstrably more realistic than the first.

47. Another way of conveying the same information is to ask what the equity risk premium above the risk free rate specific to the sample of utilities would have to be, assuming the risk free rate can be proxied by the return on five year CGS as proposed by the draft decision. This question is answered in the table below.

¹³ By way of illustration, in order to the current set of forecasts to be consistent with the previous NER WACC we tested (12.45%) the future rate of dividend falls would need to be negative 7%.



Firms NER E propos		Implied ERP with assumed nominal dividends growth rate post 2013 of:				
		Inflation (2.5%)	Zero (0.0%)	Negative 5%	Negative 17.1%	
Aust Pipeline Trust	4.8%	12.4%	11.0%	8.3%	2.7%	
DUET	4.8%	15.8%	14.5%	12.1%	7.2%	
Envestra Limited	4.8%	15.8%	14.6%	12.2%	7.3%	
SP AusNet	4.8%	14.7%	13.4%	10.9%	5.8%	
Spark Infrast. Grp	4.8%	11.8%	10.3%	7.6%	1.8%	
Hastings Div Utils	4.8%	14.9%	13.4%	10.4%	4.0%	
Average	4.8%	14.2%	12.9%	10.3%	4.8%	
Firms	NER ERP current	Implied ERP wit	h assumed nomin o	al dividends growt f:	h rate post 2012	
Firms	NER ERP current	Implied ERP wit	h assumed nomin o Zero (0.0%)	al dividends growt f: Negative 1%	h rate post 2012 Negative 2%	
Firms Aust Pipeline Trust	NER ERP current 6.0%	Implied ERP wit	h assumed nomin o Zero (0.0%) 7.1%	al dividends growt f: Negative 1% 6.5%	h rate post 2012 Negative 2% 6.0%	
Firms Aust Pipeline Trust DUET	NER ERP current 6.0%	Implied ERP wit Inflation (2.5%) 8.7% 7.0%	h assumed nomin o Zero (0.0%) 7.1% 5.4%	al dividends growt f: <u>Negative 1%</u> 6.5% 4.8%	h rate post 2012 Negative 2% 6.0% 4.1%	
Firms Aust Pipeline Trust DUET Envestra Limited	NER ERP current 6.0% 6.0% 6.0%	Implied ERP wit Inflation (2.5%) 8.7% 7.0% 10.5%	h assumed nomin o Zero (0.0%) 7.1% 5.4% 9.0%	al dividends growt f: <u>Negative 1%</u> 6.5% 4.8% 8.5%	h rate post 2012 Negative 2% 6.0% 4.1% 7.9%	
Firms Aust Pipeline Trust DUET Envestra Limited SP AusNet	NER ERP current 6.0% 6.0% 6.0% 6.0%	Implied ERP wit Inflation (2.5%) 8.7% 7.0% 10.5% 7.8%	h assumed nomin o Zero (0.0%) 7.1% 5.4% 9.0% 6.2%	al dividends growt f: <u>Negative 1%</u> 6.5% 4.8% 8.5% 5.6%	h rate post 2012 Negative 2% 6.0% 4.1% 7.9% 5.0%	
Firms Aust Pipeline Trust DUET Envestra Limited SP AusNet Spark Infrast. Grp	NER ERP current 6.0% 6.0% 6.0% 6.0% 6.0% 6.0%	Implied ERP with Inflation (2.5%) 8.7% 7.0% 10.5% 7.8% 9.0%	h assumed nomin o Zero (0.0%) 7.1% 5.4% 9.0% 6.2% 7.5%	al dividends growt f: <u>Negative 1%</u> 6.5% 4.8% 8.5% 5.6% 7.0%	h rate post 2012 Negative 2% 6.0% 4.1% 7.9% 5.0% 6.4%	
Firms Aust Pipeline Trust DUET Envestra Limited SP AusNet Spark Infrast. Grp Hastings Div Utils	NER ERP current 6.0% 6.0% 6.0% 6.0% 6.0% 6.0% 6.0%	Implied ERP wit Inflation (2.5%) 8.7% 7.0% 10.5% 7.8% 9.0% 10.7%	h assumed nomin o Zero (0.0%) 7.1% 5.4% 9.0% 6.2% 7.5% 9.3%	al dividends growt f: <u>Negative 1%</u> 6.5% 4.8% 8.5% 5.6% 7.0% 8.7%	h rate post 2012 Negative 2% 6.0% 4.1% 7.9% 5.0% 6.4% 8.2%	

Table 3: NER ERP versus DGM ERP

Source: CEG Analysis

- 48. This table demonstrates that if investors expect the long term path of dividends beyond 2013 to increase with inflation then the implied equity risk premium across the sample of utilities is 14.2%. This contrasts with the 4.8% equity risk premium currently proposed by the AER draft decision. In fact, even if dividends were expected to not rise with inflation (fall in real terms by -2.5%) the implied equity risk premium would still be 12.9%. Moreover, even if we assumed that there was zero value for imputation credits, that is, the market was only valuing cash dividends, not associated imputation credits, the equity risk premium would still be 9.0% if dividends were expected to stay constant in nominal terms beyond the forecast period. This is still almost double the AER's proposed equity risk premium of 4.8% (based on a beta of 0.8 and MRP of 6%).
- 49. In our view it is unrealistic to believe that the market expects dividends to permanently fall in real terms by 2.5% beyond 2013. It is even more unrealistic to assume that the market expects dividends to fall at 17.1% (the rate required for the cost of equity derived from implementation of the draft decision to be correct). For this reason we consider that the estimate of the equity risk premium applying to our sample of utilities in November 2008 is above 12.9%. This is more than double the 4.8% equity risk premium resulting from application of the AER draft decision in November 2008. A reasonable estimate of the equity risk premium in November is at least equal to 14.2% (consistent with an assumption that investors expect dividends to stay constant in real terms beyond 2013).



Conclusion

A reasonable estimate of the equity risk premium applying to utilities in November 2008 is more than two and a half times the equity risk premium that would have resulted from application of the AER draft decision.

2.3. Time series illustration

50. The figure below provides an illustration of the implied cost of equity estimated using a similar methodology at points in the past. This is compared on the same graph with an increase in the NER cost of equity (including at the far right of the graph the proposed reduction in the NER cost of equity associated with the draft decision.

25% 20% 15% 10% DGM ROE Regulatory ROE 5% 0% 1un2008 APT 2001 1un2001 Dec 2001 4ep2008 A912008 Dec 2005 5eb2006 APT 2006 1¹¹⁷²⁰⁰⁶ AUB 2006 0^{ct2006} Dec 2006 feb2001 AUE 2001 0022001 AUE 2008 0^{ct.2008}

Figure 3: DGM vs NER implied cost of equity for utilities December 2005 to December 2008

Source: CEG analysis – see Appendix C



- 51. It can be seen that the NER cost of equity is generally below the implied cost of equity and that this is especially true using the most recent data (the above graph ends at 3 December 2008).
- 52. It should be noted that the method going backward in time is not identical to the method described in the above sections using November 2008 data. This is because we do not have a long time series of dividend forecast and instead use the assumption of perfect foresight by investors in relation to dividends already paid. To the extent that actual dividends have surprised investors on the upside (downside) during this period then our estimates of the equity premium prevailing in the past will be biased up (down). The methodology is described in more detail in Appendix C.



3. DGM analysis for the market as a whole

3.1. Market cost of equity rising while NER cost of equity falling

- 53. The relatively high risk premiums attached to utility stocks at the moment are not an isolated phenomenon. The return on equity demanded by investors across all sectors and in all corporate assets (equity and debt) is historically high at the present time, reflecting a general repricing of risk in capital markets following the losses made in the US subprime mortgage market and compounding effects in global capital markets.
- 54. In debt markets, investors' higher required return is evidenced by significant reductions in the market value of debt which is the mechanism by which interest rates (the return to debt providers) increases. The same is true in equity markets. Reductions in the value of equity reflect the unwillingness of investors to provide equity at previous low levels of dividend yields (analogous to interest rates in debt markets). From its peak in October 2007 to December 2008 the ASX S&P200 has dropped 45%. The RBA reports that this has been associated with a near doubling in dividend yield over the same period from 3.66% to 7.03%.
- 55. Just as higher interest rates in debt markets are a signal of higher cost of debt, higher dividend yields in equity markets are a signal of higher cost of equity.
- 56. Importantly, the 'flight from risk' associated with an increasing cost of corporate equity/debt has been mirrored by a 'flight to safety'. The demand for government debt has risen dramatically with the effect that nominal CGS yields have fallen dramatically. CGS yields are currently at unprecedented low levels and there is no sign of any imminent recovery in these yields. This is illustrated in Figure 4 below.





Figure 4: Nominal 10 year CGS yields over time

Source: RBA data

- 57. Under section 6.5.2 of the National Electricity Rules (NER), compensation for the cost of equity has been falling in line with the fall in nominal CGS and, consequently, is now at historically low levels. This is because the structure of the NER is such that only one parameter (the risk free rate) varies based on market evidence but other parameters (equity beta, market risk premium (MRP) and gamma) are all fixed for five year intervals.
- 58. Recent events in financial markets create an important contrast between the movements in the NER cost of equity and the actual cost of equity in the market place. The former has fallen to historically low levels at the same time the latter has risen to historically high levels. We note that this is consistent with two possible explanations:
 - the yield on CGS is currently a poor proxy for the risk free rate used to estimate the cost of equity in the CAPM;¹⁴ or

¹⁴ We discuss this further in our companion report CEG, CGS as a proxy for the risk free rate, January 2009.



- the yield on CGS is a good proxy for the risk free rate used in the CAPM but the MRP has recently moved in the opposite direction to the yield on CGS.
- 59. Whatever the explanation, we note that the implication is the same, that is, the current actual cost of equity is above the cost of equity compensated in the NER. This is illustrated in Figure 5 below which estimates the forward looking market cost of equity based on a method used by AMP Capital Investors¹⁵ and cited in the AER decision explanation.

Figure 5: Recent movements in the regulated and market return on equity (excluding draft decision)



Source: RBA data, CEG analysis

¹⁵ AMP Capital Investors (2006), *The equity risk premium – is it enough?* Oliver's insights, Ed.13, 4. This methodology involves estimating the cost of equity by adding the long term average nominal growth in GDP (as a proxy for long term average nominal growth in dividends) to the prevailing dividend yield for the market as a whole. This gives a 'cash' cost of equity. To convert this into a cost of equity including the value of imputation credits one needs to scale up the cost of equity by the relevant factor. In the figure below we have used 6.6%pa as the long run growth path for nominal GDP (based on average real growth in GDP from 1959 until 2008 plus inflation of 2.5%) and we use a scaling factor of 1.28% to capture the value of imputation credits based on the AER's estimate of gamma being equal to 0.65. This is not necessarily because we believe this is an accurate estimate of gamma – it is just that it is necessary to have the same gamma assumptions when scaling up our cash cost of equity to arrive at a comparable figure for the AER's proposed cost of equity (before the value of imputation credits are removed).



- 60. The AER draft decision notes that the DGM cost of equity was commonly below the AER cost of equity (assuming a beta of 1.0) in the recent past. We concur with this but note that market evidence shows that there is currently a dramatic divergence in the other direction. The current cost of equity in the Australian market is around 16%. When we deduct the current yield on CGS of around 4% from this we get an estimate for the MRP of approximately 12% – double the 6% MRP established in the NER.
- 61. This estimate of the prevailing market risk premium is consistent with the estimate of the prevailing equity risk premium for our sample of utilities in the previous sections (14.2%). This demonstrates that utilities have not been immune from this general repricing of risk. This is despite *"the stable cash flows of regulated utilities"* ascribed to them in the draft decision.¹⁶
- 62. This finding is also buttressed by the fact that, since the subprime crisis in the US first became evident (early August 2007)¹⁷ until 3 December 2008 the general level of stock prices and the prices of the utility stocks examine in the previous section have fallen by almost exactly the same amount as the broader stock market (38%). This strongly supports the view that:
 - there has been a significant repricing of equity risks in general; and
 - utility stocks have not been immune from the general repricing of equity risks.
- 63. The reduction in the regulatory ROE illustrated in Figure 5 is largely due to the fall in CGS yields in the latter half of 2008 a fall in yields that is demonstrably coincident with a rise in the actual cost of equity observed in the market. This inverse relationship between government bond yields and the return on equity is not surprising and is well documented in the finance literature.¹⁸ However, this is not reflected in the Australian regulatory approach.
- 64. The effect of the draft decision, if implemented, would be to widen the gap between the prevailing market cost of equity and the regulatory cost of equity.

¹⁶ Draft decision, p.192

¹⁷ On 9 August 2007: French investment bank BNP Paribas suspended three investment funds that invested in subprime mortgage debt due to a "complete evaporation of liquidity" in the market. The bank's announcement is the first of many credit-loss and write-down announcements as subprime assets went bad. The next day the his the European Central Bank announced an injection of 95 billion euros into the European banking market. In an attempt to restore liquidity.

¹⁸ For example, Lettau, Martin and Sydney Ludvigson, 2001, "Consumption, Aggregate Wealth and Expected Stock Returns," Journal of Finance 56 (3), pp. 815—849. Amongst other findings, they found a strongly statistically significant inverse relationship between the change in US Treasury yields and the change in the observed MRP relative to Treasury yields. Lettau and Ludvigson found that when the risk free rate fell the MRP tended to rise by the same amount as the fall in the risk free rate and vice versa. That is, a 1% reduction/increase in the risk free rate tended to be associated with a 1% increase/reduction in the MRP (measured relative to Treasury yields).



The draft decision makes changes to WACC parameters (beta, the term of the risk free rate and gamma) that would reduce the allowed post-tax return on equity by around 162 basis points (1.62%) based on parameter values in December 2008.¹⁹ Figure 6 below replicates the analysis from Figure 5 except it includes a 1.62% reduction in the regulatory cost of equity in the month of December 2008 – to reflect the effect of the draft decision if implemented.

Figure 6: Recent movements in the regulated return on equity (including draft decision)



Source: RBA data, CEG analysis

65. This figure illustrates the combined effect of historically unprecedented low CGS figures *and* the proposed changes to the NER parameters in the AER's draft

¹⁹ The total (including the value of imputation credits) estimated cost of equity under the existing NER rules in December would be 10.2% (risk free rate of 4.2% + equity premium of 6%). However, in cash terms this must be reduced by the assumed value of imputation credits. At a gamma of 0.5 and a corporate tax rate of 0.3 this requires that 10.2% be divided by 1 + 0.5*0.3/0.7 = 1.21. This gives cash compensation for the cost of equity of 8.4%. However, under the draft decision proposals the total cost of equity falls to 8.7% (risk free rate of 3.9% based on 5 year CGS instead of 10 year CGS yields + equity premium of 4.8% which is 1.2% lower to reflect the reduction in beta from 1.0 to 0.8 while the MRP of 6% is retained). To convert this to a cash cost of equity this must be divided by 1.28 to reflect the proposed gamma of 0.65 (1.28 = 1+.65*0.3/0.7). This gives cash compensation for the cost of equity of 6.82%. The difference between 8.44% and 6.82% is 1.62 percentage points. As a percentage of 8.44% this is a 19% reduction.



decision. It contrasts this with an estimate of the average return on equity actually required by investors in the equity market today. Our estimate of the MRP is derived by discounting a stream of dividends into perpetuity. Consequently, this should be thought of as a long run forward looking MRP. Officer and Bishop use a different methodology to estimate the short term forward looking MRP to be around 16-18%.²⁰

- 66. The important conclusion is that the AER draft decision comes at a time when:
 - the NER formula is already giving an historically low return to equity investors (due to the historically low CGS yield); and
 - the actual cost of equity in the market for funds is at historically high levels.
- 67. The consequence of the AER's draft decision, if implemented, would be to materially widen this already significant gap.

3.2. Sensitivity analysis - other estimates of the forward looking cost of equity

- 68. The AER relies on the results of DGM analysis by Davis (1998), Lally (2002) and AMP (2006) when determining that the MRP should be set below the historical average excess return.²¹ These studies estimated the forward looking MRP range to be below 6.0%. However, all of these studies are aged and come from a period before a general repricing of risk in equity markets. We demonstrate in this section that any updated DGM analysis would result in a higher forward looking MRP than 6.0%
- 69. The estimates of the forward looking cost of equity provided in Figure 5 are derived from the application of a specific method (that used by AMP Capital Investors) and specific assumptions regarding long term average GDP growth (6.6%). However, there are other methods/assumptions that can be employed to estimate the forward looking cost of capital and other potentially plausible assumptions.
- 70. In this section we explore whether there is any alternative set of assumptions that could plausible result in an implied market risk premium that is equal to or below

Officer and Bishop, Market Risk Premium, page 7. The Officer and Bishop estimates assume a constant price per unit of risk where risk is measured by the expected volatility in the value of the stock market index. This expected volatility can be estimated from option prices for the stock market index and is currently at historically high levels. Thus, if the price of risk is constant the higher level of risk (higher level of expected volatility) implies a higher required compensation for risk (higher MRP). Our estimates are lower than this. One likely reason why, is that our estimates are based on discounting perpetual dividends (ie, dividends into the long term) and it may be that investors perceive a lower level of risk beyond the period for which options are traded.

²¹ Draft decision, p.172.



the AER's draft decision estimate of 6.0%. Specifically, we explore what level of expected fall in near terms dividends would be required to make current equity market prices consistent with an MRP of 6.0%. (Noting that, the lower expected future dividends are, the lower is the implied MRP required to equate the present value of those dividends with observed market prices of equity).

- 71. We conclude that there is no such set of plausible set of assumptions.
- 72. The AMP method starts with a market-wide dividend yield estimate and adds the long term growth rate in GDP. If, as is currently the case in Australia and around the world, GDP growth is expected to be below average for the next few years then this expectation can be explicitly incorporated in the modelling.
- 73. We initially do this by adopting the following facts and assumptions:
 - market wide dividend yield estimate of²² for December 2008 of 7.03 sourced from the Reserve bank of Australia (RBA)²³;
 - 5 year CGS yields of 3.92% average for December sourced from the RBA;
 - an assumption of 2.5% nominal dividend growth for the next 4 years (ie, zero real dividend growth with inflation of 2.5% and below real GDP growth forecasts by Consensus Economics²⁴ of 0.9% in 2009 rising to 3% in 2011);
 - an assumption of 6.6% earnings (and hence dividend) growth beyond 4 years (equal to real GDP growth from 1959 to 2008 plus a forecast inflation rate of 2.5%);
 - an assumption that, on average, dividends are received half way through the year; and
 - a value of gamma of 0.65 implying that after corporate tax profits should be grossed up by a factor of 1.28.^{25,26}

²² That is total market dividends divided by total market capitalisation.

²³ RBA Statistical Bulletin F7.

²⁴ Consensus Economics Asia Pacific Forecasts, 12 January 2009.

²⁵ Being 30% (the corporate tax rate) multiplied by 65% divided by (1 minus the corporate tax rate) all plus 1. That is, 1.28 = 0.3*0.65/(1-0.3) +1.

²⁶ However, in our analysis we conservatively only gross up dividends (ie, we assume that imputation credits distributed with dividends have a value of 0.65 their face value and imputation credits generated but not yet distributed have a value of zero).



- 74. Under these assumptions the December dividend yield of 7.03% can only be explained by a market wide ROE of around 15.6% implying an MRP of around 11.6% given the CGS yield of 3.9%.²⁷ That is, even if we assume that real dividends growth are zero (at inflation of 2.5%) for the next four years, the implied MRP in December 2008 was still 11.6%.
- 75. However, it is possible that the market expectations are even more pessimistic than this. To explore this, imagine instead that we keep the same assumptions as above except we allow dividends in 2009 to fall by the amount necessary to arrive at a 6% MRP. That is, we continue to assume that from 2010 to 2013 dividend growth will be zero in real terms followed by real dividend growth of 4.1% per annum thereafter (6.6% nominal with a 2.5% inflation forecast). We then ask how much dividends would have to fall in 2009 to arrive at an MRP of 6%.
- 76. The answer to this question is that dividends would have to fall in nominal terms by 61%. The best way to see how dramatic the reduction in earnings is for this scenario is to show it graphically.

²⁷ The figures do not add exactly due to rounding.





Figure 7: Implied real equity market dividend profile if MRP = 6% in December 2008

*Assumes inflation of 2.5% pa

- 77. This figure illustrates the implied dividend profile that is consistent with an MRP of 6% given market data from December 2008. Real dividends would have to:
 - immediately more than halve from their 2008 level;
 - stay at that new low level for four years;
 - then rise at a 4.1% real (6.6% nominal) (which is consistent with the long term average for real GDP growth plus inflation of 2.5%).
- 78. It is relevant to note that in this scenario real dividends only recover their 2008 levels in 2037 (29 years later). Moreover, there is no 'bounce back' in dividends following the 2009 halving in dividends. That is, the disastrous 2009 drop in dividends is permanent. We are unaware of any analysts' earnings projections that come anywhere near this forecast.



- 79. Obviously there are other possible forecasts for earnings growth that will also be consistent with a 6.0% MRP. However, these must all have the same present value of the above projections. If one accepts that the present value of this projection of earnings is unrealistic then one must equally accept that any other projection with the same present value is equally unrealistic.
- 80. For example, if we instead constrain growth in dividends beyond 2009 to be constant in real terms we get a smaller required reduction in dividends in 2009. Instead of being a 61% reduction of only 21% is required to achieve consistency with an MRP of 6%. This is a less outlandish (although still unrealistic) assumption, however, we now have an equally unrealistic projection that real dividends will permanently be 21% lower than 2008 levels (ie, dividends will never recover).

Conclusion

There is no reasonable set of assumptions about dividend growth that would be consistent with a forward looking MRP of 6.0% in December 2008.

A conservative estimate of the actual forward looking MRP in December 2008, based on zero real growth in dividends for four years, is 11.6%.

3.3. What regard should the AER have to current market conditions?

- 81. This raises the obvious question as to what regard the AER should have to current market conditions? In particular, what regard should the AER have to current market conditions given that the first regulatory period that will be affected by any change to WACC parameters will begin in July 2010 (18 months away) and the last regulatory period affected will begin in July 2014 (66 months away).
- 82. It may be reasonable to conclude that the WACC parameters set now should have regard to the expected cost of equity over that time (ie, not to solely focus on the currently prevailing cost of equity). However, any such adjustment must be based on an explicit forecast of future events in capital markets. To the extent that the market cost of equity can be forecast to fall over that period and the yield on CGS can be forecast to rise then the current observed gap between the market and regulatory cost of equity can be expected to close over time (and may even reverse at some future point).
- 83. Whether this will actually be the case is currently unknowable. It depends on whether the recent 'repricing of risk' that we have observed in capital markets is a temporary or permanent phenomenon. If it is a temporary phenomenon it depends on how long it takes for current risk premiums to revert back to some



more normal level and it also depends on whether any such 'new' normal level will be higher than the 'old' normal level.

- 84. In our view it is reasonable to assume that current risk premiums (in both debt and equity markets) will not be permanently sustained into the future. If this were to be the case then the market risk premium (MRP) would need to be maintained at current levels which we estimate to be around 12%. This is substantially above the historical average of between 6.1% and 6.7% as estimated by the AER and is also significantly above the JIA estimate of 7.0% (including the value of imputation credits).
- 85. It may be reasonable to forecast that at least some of this heightened risk premium will diminish in the future assuming that market volatility (which is at all time highs) will itself diminish. However, such a forecast must, inevitably, be treated as highly uncertain. Even if it were actually borne out that the cost of equity eventually returned fully to average historical levels this would still likely leave businesses undercompensated in the mean time.
- 86. Moreover, it is not, in our view, reasonable to forecast that all of the recent repricing in risk will be eliminated in either the medium term (5 plus years) or the short term (1 to 5 years). In our view, this repricing of risk should be treated as having a permanent component and is, at least in part, a reflection of the fact that in the recent past corporate risk was underpriced by the market. This mistake is now clear to market participants (who have seen the value of their corporate debt and equity portfolios approximately halve over the last 12 months or so). It follows that any new equilibrium level of risk premium is likely to be materially higher than the risk premium observed in the past. In any event, the draft decision results in the cost of equity falling well below the level that existed even before the advent of the financial crisis. Relying on an implicit forecast that this will actually occur is, in our view, not appropriate.
- 87. We note that there are a large number of commentators who believe that the recent repricing of risk in capital markets has been 'necessary' and will have permanent effects. For example, the European Central Bank stated in June 2008.²⁸

"In this vein, the sub-prime-related turmoil has acted as a catalyst for a broader, and in many instances necessary, reappraisal and repricing of risk."

88. Furthermore, in the current uncertain economic climate, it is appropriate to assume that the required return on equity will remain above any new equilibrium

²⁸ European Central Bank, *Financial stability review*, June 2008, page 11



level while uncertainty about future economic conditions is itself heightened. That is, some of the repricing in risk is likely to be permanent and some of the repricing of risk is likely to be conditional on continuing uncertainty in economic conditions. While the latter *may* disappear over the next five years it is a very strong (even extreme) assumption that it *will* disappear. The best estimate must be that equity risk premium will remain heightened over historical levels for both reasons over the next five years.

- 89. For precisely the same reasons, the best estimate of the yield on CGS is that it will remain at historically low levels over the next five years. This view is confirmed by the shape of the current yield curve with 10 year CGS yielding around 0.3% more than 5 years CGS in December 2008. Based on this evidence the market is not expecting significant increases in CGS yields in the next five years.
- 90. If this is correct then, application of the *current* NER WACC parameters over the next five years is likely to result in substantial under-compensation of equity investors. This reflects both the fact that:
 - the required return on equity is likely to be historically high;
 - the yield on CGS is likely to be historically low (which lowers the regulatory cost of equity under the current formula).
- 91. This would appear to suggest that now is not the correct time to be further lowering the regulatory return on equity in the manner proposed in the draft decision.
- 92. This is, in our view, especially true given the significant concerns we have about the reasons relied upon for reducing equity beta and choosing 5 year CGS as the appropriate proxy for the risk free rate (which are the two areas we have been asked to examine). These concerns are discussed separately in two other detailed reports and in our overview report.²⁹

²⁹ CEG, Estimating the NER equity beta based on market data – a response to the AER draft decision, January 2009 CEG, Choosing a proxy for the risk free rate – a response to the AER draft decision, January 2009. CEG, Overview of CEG analysis, January 2009.



Conclusion

A reduction in the NER cost of equity in current market conditions would widen the already significant gap between the market cost of equity (measured for the market as a whole and for utilities specifically) and the forward looking cost of equity. We estimate the existing gap at around 6%.

Any such reduction would need to be justified based on a confident forecast the market cost of equity will fall by more than 6% in the near term (or, failing that, that the yield on CGS will rise by more than 6% in the near term).

In the absence of a basis for such a forecast (and we are aware of none) reducing the NER cost of equity can be expected to contribute to an already significant under-compensation for the actual forward looking cost of equity.

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4. AER consideration of CEG DGM analysis

4.1. Handley critique

- 93. The AER asked Associate Professor Handley from Melbourne University to provide an analysis of our report. We agree with the analysis provided by Handley.
- 94. Handley noted that forecasts of dividends should be based on forecasts of free cash-flows. That is, any dividend forecast must be consistent with a forecast of free cash-flows that is capable of supporting that dividend policy. We did not provide such an analysis ourselves but relied on assumption that the analysts' forecasts of dividends were based on the analysts' forecasts of free cash-flows. Based on our experience this is exactly the practice followed by equity analysts (it would be highly unprofessional to provide dividend forecasts without the requisite due diligence about sustainability of dividends) and therefore we consider our approach is reasonable and valid. While it would be preferable to also have analysts' forecasts of free-cash flows these are not available. The alternative would be for CEG to develop its own analysis of free cash-flows and to impose adjustments on the analysts' forecasts of dividends where we considered the two to be inconsistent. However, this would ultimately be a CEG forecast of dividends - which would defeat the purpose of attempting estimate the market's forecast based on analysts' projections.
- 95. Nonetheless, we agree with Handley that our results rely on the presumption that analysts are forecasting dividends that are consistent with underlying profitability of the firms. Given the AER's view regarding *"the stable cash flows of regulated utilities"*³⁰ we regard our assumption as reasonable (and note that the draft decision presents no evidence to the contrary). Rather, we believe that the alternative assumption that presumes, without supporting evidence, that professional analysts are forecasting dividends that are inconsistent with underlying profitability is likely to be unreasonable.
- 96. Handley's only other observation of a limitation in our conclusions is that the DGM analysis is sensitive to variations in forecast dividends. By way of illustration Handley noted that if:
 - analysts' projections of dividend growth over the next four years (4.1%) were higher than market expectations (which he assumed to be 2.0%); and
 - if dividends also grew at 2.0% beyond the next four years; then

³⁰ Draft decision, p.192



- notwithstanding the downward correction in dividend growth, the implied cost of equity would still be above the NER cost of equity.
- 97. However, Handley then imposed a further assumption that the market actually expected dividends to drop by 10% next year and stay permanently 10% lower than in the above scenario. With this further assumption Handley noted that the implied cost of equity would be lower than the NER cost of equity.
- 98. It is worth noting that, by the end of the analyst forecast period, Handley's most pessimistic scenario implied that the market was expecting dividends to be 20% lower than the analysts' forecasts. Whilst we accept that imposing such a set of assumptions can give an implied cost of equity (in June/July 2008) that is lower than the NER cost of equity, we note that one should have some basis for believing that analysts forecasts are so dramatically higher than investor forecasts. In any event, as evidenced in section 2, it is demonstrably the case that the NER cost of equity based on the proposals in the draft decision would yield a cost of equity that is below the cost of equity observed in the market in November 2008.
- 99. On the basis that DGM analysis is sensitive to input assumptions Handley states:³¹

"In summary, in my opinion the DGM is only appropriate for a "back of the envelope" type valuation and, in any case, should be treated with caution."

- 100. While we would not use the phrase, "back of the envelope", we do agree with Handley that DGM analysis relies on input assumptions and will not give a perfect estimate of the cost of equity but rather a range for such an estimate. However, we would add that the same is true, and generally more so, for estimates of the cost of equity derived in other ways. This includes estimation of the cost of equity using particular implementations of asset pricing models such as the capital asset pricing model (CAPM). Therefore to the extent that this criticism is valid, it is also a valid criticism of any given implementation of the CAPM framework. This is especially true of the AER's method of implementing that CAPM, based solely on stock market data, which is known to result in biases as described in our companion report.³²
- 101. We also note that, consistent with the advice in our previous report, the DGM is used routinely by US regulators as the primary method for setting the return on equity for regulated electricity and gas businesses. It is simply wrong to suggest

³¹ Handley, p.9

³² CEG, Estimating the NER equity beta based on stock market data – a response to the AER draft decision. January 2009



that there is an established view that the AER's particular attempts at implementing the theoretical CAPM model provide a more reliable estimate of the cost of equity than a DGM analysis.

- 102. For the AER to come to this view the AER must have more faith in the outputs of that theoretical model (which are themselves based on the AER's assumed inputs) than it has in the market's views. That is, the AER must believe that it knows better than the market.³³ We consider that this is a view that economic regulators should not, in general, rely on.
- 103. In this regard we note that the AER's proposed implementation (estimating beta using stock market data) of the Sharpe CAPM is well known not just to be inaccurate but actually biased in its estimation of the cost of capital.³⁴ Handley himself notes that this is so in a separate discussion of CEG's report addressing this bias and provides an elegant description of one of the theoretical explanations for why the implementation gives biased results.³⁵
- 104. We note that Handley was asked by the AER whether the CEG analysis:³⁶

"...conclusively demonstrates the case that the implied cost of equity is higher than the cost of equity that would be derived from the National Electricity Rules." [Emphasis added.]

- 105. The AER's question, and treatment of our report in the draft decision, appears to suggest that our analysis can be assessed against a 'conclusively demonstrates' benchmark. However, in our view neither model can be hold to such a standard and the relevant question for the DGM analysis is whether there is persuasive evidence to support a view that the implied cost of equity is higher, and, if so, what weight should be given to that evidence.
- 106. By way of illustration, we think that it is reasonable to ponder what answer an expert would have given if asked whether the AER's draft decision provides a *conclusive demonstration* that the cost of equity under the current NER is 1.8% too high. In our view, an expert asked this question would answer that the AER draft decision has not conclusively demonstrated this. In fact, we believe that an

³³ In fact, the required assumption is even stronger than this. It is that the AER must believe that it knows better than the market **and** that the market will come around to its views before regulated businesses have to raise equity.

³⁴ See discussion in CEG, Estimating the NER equity beta based on market data – a response to the AER draft decision, January 2009

³⁵ Handley notes that the empirical evidence provided by CEG is not new and does not debate its accuracy. He goes onto to explain that this may be because the Sharpe CAPM is flawed or simply because the Sharpe CAPM cannot be accurately implemented using stock market data. See Handley, p.5.

³⁶ Handley, p.2



expert would be more likely to conclude that the AER has not 'conclusively demonstrated' that reducing the NER cost of equity at all will increase its accuracy in current market conditions and that a stronger case exists for it increasing it.

107. However, as described in previous sections, since the second half of 2008 there has been significant widening in the gap between the NER and implied market cost of equity. On the basis of our more up to date analysis, we consider that we have conclusively demonstrated that the implied cost of equity is higher than the cost of equity that would be derived from the National Electricity Rules.]

4.2. AER discussion

108. The draft decision concludes its discussion of our report by stating:³⁷

"CEG's DGM analysis has not provided persuasive evidence that the cost of equity following the current NER transmission WACC parameters is less than the market's implied required rate of return on equity for Australian energy utilities."

- 109. This appears to be the end of the consideration of our results in the draft decision. However, a finding that these results do not provide persuasive evidence for change in one direction does not, in our view, mean that the results should be ignored when imposing a change in the opposite direction. An economically sensible approach would be to compare the weight of evidence for movements in either direction and to determine on the basis of this evidence whether persuasive evidence exists for a change.
- 110. Importantly, the AER separately relies on the results of DGM analysis by Davis (1998), Lally (2002) and AMP (2006) when determining that the MRP should be set below the historical average excess return.³⁸ These studies estimated the forward looking MRP range to be below 6.0%. In our view, it would have been appropriate to give consideration to our more recent results³⁹ at the same time consideration was given these older results or to give some basis for not doing so.
- 111. The AER also extends Handley's critique of the problems with DGM analysis by stating:

³⁷ Draft decision, p.251

³⁸ Draft decision, p.172.

³⁹ Our results also estimated an implied MRP, albeit associated with an assumed equity beta for the group of utility businesses being studied.



- DGM analysis assumes that markets are perfectly priced;
- CEG only reported the Bloomberg average forecast rather than the individual analysts forecasts detailed forecasts and did not disclose the exact dates in which each forecast was made; and
- CEG had inconsistently taken the CGS yield from a single day rather than an average of the same period over which share prices were taken.
- 112. In relation to the first dot point we agree that the DGM assumption assumes that current market prices reflect what investors currently believe equities are worth. However, we note that this is also an assumption underpinning the Davis (1998), Lally (2002) and AMP (2006) DGM results. Moreover, we note that this is the precisely the rationale for DGM analysis. It is not obvious to us what the negative implication this observation has for our analysis. As far as we are aware there is no better estimate for what investors believe is the current risk adjusted value of equities than the price that they are prepared to pay. It is only from this risk adjusted value that one can estimate investors prevailing risk adjusted discount rate. In any case, the derivation of the CAPM itself is based on assets being 'perfectly priced' which suggests that to the extent it was of any concern to the AER in accepting the results of a DGM analysis it should be of equal concern to the AER in its own attempt to implement the CAPM.
- 113. In relation to the other points, we note that we provide a full disclosure of the data underlying our forecasts and other data used by us in Appendix B.
- 114. Finally, and notwithstanding the commentary from the AER and Handley, our updated DGM analysis does provide persuasive evidence that, in late 2008, the cost of equity following the current NER transmission WACC parameters is less than the market's implied required rate of return on equity for Australian energy utilities.



5. Conclusion

115. The analysis in this report is directly relevant to any forward looking estimate of the prevailing cost of equity as required by 6.5.4(e)(1) of the NER:

"the need for the rate of return calculated for the purposes of clause 6.5.2(b) to be a forward looking rate of return that is commensurate with prevailing conditions in the market for funds and the risk involved in providing standard control services"

- 116. In November 2008 it was the case that, assuming dividends grow in line with inflation beyond the forecast period (beyond 2013), the implied cost of equity for the same utilities is 18.8% and the NER cost of equity (based on the draft decision proposal) is 9.38%.
- 117. The magnitude of this difference makes the high level result insensitive to the forecast of future dividends.⁴⁰ That is, for any reasonable set of assumptions it is, in our view, simply not possible to conclude that the forward looking cost of equity for utilities was lower than the NER cost of equity (adjusted for the AER's proposed changes to the NER) in November 2008.
- 118. This result is corroborated by a DGM analysis of the stock market as a whole. The figure below illustrates the recent changes in both the implied cost of equity for the market as a whole and the NER cost of capital.

⁴⁰ We now find that, in order for the November 2008 forward looking implied cost of equity to be equal to the NER cost of equity associated with implementing the AER's proposals, the rate of dividend reductions beyond the analyst forecast period (beyond 2013) must be 13.5%pa forever (15% real at an inflation rate of 2.5%). For this to be true investors must be expecting dividends to fall by 80% ((1-0.15)¹⁰ -1 = 0.8.



Comparison of the average cost of equity in the market as a whole and the regulated return on equity (including draft decision)



Source: RBA data, CEG analysis

- 119. This figure illustrates the combined effect of historically unprecedented low CGS figures and, in December 2008, the proposed changes to the NER parameters in the AER's draft decision. It contrasts this with an estimate of the average return on equity actually required by investors in the equity market today.
- 120. We perform sensitivity analysis for the assumptions underlying the above graph. As was the case with utilities, we find that the magnitude of this difference makes the high level result insensitive to the forecast of future dividends. That is, for any reasonable set of assumptions it is, in our view, simply not possible to conclude that the forward looking cost of equity for utilities was lower than the NER cost of equity (adjusted for the AER's proposed changes to the NER) in November 2008.
- 121. The important conclusion of both sets of analysis (utility specific and the market as a whole) is that the AER draft decision comes at a time when:
 - the NER formula is already giving an historically low return to equity investors (due to the historically low CGS yield); and



- the actual cost of equity in the market for funds is at historically high levels.
- 122. The consequence of the AER's draft decision, if implemented, would be to materially widen this already significant gap. This cannot be reasonably justified without a confident forecast that the market cost of equity will fall (or the yield on CGS rise) by around 6% in the near term. We are unaware of any basis for such a forecast.
- 123. We find that the reasons provided by the AER for rejecting the relevance of our previous report were not well grounded. They provide even less basis for rejecting the relevance of the findings in this report given the increased magnitude of the gap between the forward-looking cost of equity at the AER's proposed reduction in the NER cost of equity.

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Appendix A. Description of the Dividend Growth Model

124. The dividend growth model (DGM) is not an asset pricing model but rather is a logical process that works backwards from the following finance relationship:

The market value of an asset = PV of future payments from the asset

A.1. Formulaic description of DGM

125. In the case of equity, the future payments from the asset are in the form of dividends (D_t) paid at future points in time "t". The present value of a dividend stream is given by the following formula – where "k" is the discount rate applied to equity (which is also assumed to be constant).

Value of a series of payments
$$D_t = \sum_{T=1}^{T=t} \frac{(D_t)}{(1+k)^t}$$
 (1)

If it is assumed that, beyond time T, dividends will grow perpetually⁴¹ at a constant rate "g" then today's value of payments beyond T is given by:

Value of D growing at g beyond time
$$T = \frac{D_T \times (1+g)}{(k-g)} \times \frac{1}{(1+k)^T}$$
 (2)

- 126. If we have a finite set of forecasts up to time T and a perpetually growing forecast beyond time T can estimate the value of the equity as:
 - the present value of dividends D₁ to D_T from equation (1); plus
 - the present value of dividends beyond D_T using equation (2).
- 127. This gives the following formula for the value of the equity.

Present value of all dividends =
$$\left[\sum_{T=1}^{T=t} \frac{(D_t)}{(1+k)^t}\right] + \left[\frac{D_T \times (1+g)}{(k-g)} \times \frac{1}{(1+k)^T}\right]$$
(3)

⁴¹ Note that an investor does not have to expect to hold an equity perpetually to benefit from perpetual dividend growth. They simply have to be able to sell the equity to another investor at a price that reflects the future dividends that investor will receive. Thus, the valuation of perpetual dividends is consistent with the valuation of a finite holding period followed by a sale where the sale price is determined by future dividends at that time.



- 128. The first term in square brackets on the right hand side of equation (3) is the present value of a series of dividend forecasts covering dividends from now to period t=T. The second term in square brackets is the present value of all dividends beyond time T.
- 129. If future dividends are forecast accurately then application of formula (3) should result in a value equal to the market price of the equity. Consequently, markets' expectations of dividends are accurately forecast then it is possible to 'back out' of equation (3) the markets' implied cost of equity (k). This simply requires solving equation (3) for a value of k that gives a present value of future dividends equal to the market price.
- 130. A DGM can be applied at the level of an individual stock, a portfolio of similar stocks, or the market as whole.

A.2. Limitations to DGM analysis

- 131. It is important to understand the limitations of a DGM analysis in accurately determining the 'true' market cost of equity. Firstly, the market cost of equity is not a static number but moves around based on investors' perceptions of market risk and their willingness to be exposed to this risk. It may be that the timing of a DGM study of regulated utilities happens to coincide with a period of high/low perceived risk for the market generally or for utilities specifically. That is, a DGM study estimates the cost of equity at a particular point in time it does not imply that this is always the cost of equity.
- 132. Secondly, future dividend growth expected by investors (in regulated utilities or the market as a whole) depends on the expected future profitability of the business which depends on, for example:
 - the path of future operational efficiencies the business/market will achieve;
 - the path of future exogenous cost changes including those associated with technological change;
 - for regulated businesses, the extent to which the regulator will allow the business to benefit from cost reductions (and vice versa);
 - the regulators' stance on other factors (such as the cost of capital itself);
 - the extent to which all of the above will give rise to sufficient economic profit that will allow the business to sustainably pay a particular dividend stream.



- 133. To perform a DGM analysis one must arrive at an estimate of investors' expectations on all of the above.
- 134. As described above, for regulated businesses an important determinant of future profitability will be the stance taken by economic regulators on a range of issues.
- 135. One such issue is the cost of capital with the level of expected future dividends being higher the higher the expectation of the regulatory cost of capital. This does not pose any 'circularity' problem for the DGM analysis. This is because a higher/lower expected cost of capital allowed by the regulator will translate into both higher/lower expected future dividends and a higher/lower share price today with the effects cancelling out in the DGM analysis. Consequently, even if investors expect the regulatory cost of capital to be set below the 'true' cost of capital the DGM analysis can still be used to estimate the 'true' cost of capital.
- 136. Notwithstanding the absence of any circularity issues, uncertainty in the future value of the regulatory cost of capital does create a problem for the application of the DGM in the current context. This is because it makes it difficult to derive an estimate of the markets' expectations about future dividends. If the market expects the cost of capital to rise as a result of the current AER review then the forecast of future dividends used in the DGM analysis will need to be higher than if the opposite is true.
- 137. This uncertainty about the future inevitably means that there is uncertainty about future dividend growth. Consequently, one cannot credibly claim to estimate a single 'correct' growth path for investors' expectations. For this reason the results of the DGM analysis are reported for a wide range of scenarios for future dividend growth that might variously be described as 'optimistic' and 'pessimistic' about the above factors.



Appendix B. DGM data

- 138. The data underlying the DGM analysis in this report has been sourced from Bloomberg. Dividend per share data was collected for the six ASX-listed companies that rely primarily on revenue from regulated gas or electricity infrastructure services Australian Pipeline Trust, DUET, Envestra Limited, Hastings Diversified Utilities, SP Ausnet and Spark Infrastructure Group.
- 139. Dividend forecasts were available from 2009 to 2013 for five of these companies. Forecasts for Spark Infrastructure Group were only available through to 2012. These dividend data are replicated in full in Table 4 below.

	Dividends 2009	Dividends 2010	Dividends 2011	Dividends 2012	Dividends 2013
Aust Pipeline Trust	0.310	0.328	0.339	0.353	0.370
DUET	0.284	0.297	0.312	0.323	0.337
Envestra Limited	0.080	0.080	0.080	0.082	0.084
SP AusNet	0.120	0.120	0.122	0.130	0.130
Spark Infra. Group	0.190	0.194	0.200	0.210	
Hastings Div Utils	0.290	0.300	0.310	0.325	0.325
Sum	1.274	1.319	1.363	1.423	1.246

Table 4: Cash dividend per share forecasts for potential comparables

Source: Bloomberg

140. The timing of these forecasts is important for using them consistently with other data. The Bloomberg forecasts are themselves averages of a number of analyst forecasts of dividend yields made on varying dates. The number and dates of analyst forecasts contributing to each consensus forecast is recorded by Bloomberg. A summary of this information is provided in Table 5 below.



	2009	2010	2011	2012	2013
Aust Pipeline Trust	9	8	7	4	3
December	-	-	-	-	-
November	4	4	4	2	2
October	2	1	-	-	-
September	2	2	2	1	-
August	1	1	1	1	1
DUET	8	7	6	4	3
December	1	1	1	1	1
November	4	4	4	2	2
October	1	1	-	-	-
September	1	-	-	-	-
August	1	1	1	1	-
Envestra Limited	6	6	6	4	2
December	-	-	-	-	-
November	4	4	4	2	2
October	-	-	-	-	-
September	1	1	1	1	-
August	1	1	1	1	-
SP AusNet	11	10	9*	4	4
December	-	-	-	-	-
November	9	8	8	4	4
October	2	2	-	-	-
September	-	-	-	-	-
August	-	-	-	-	-
Spark Infra. Group	8**	7**	6	4	-
December	-	-	-	-	-
November	3	3	3	2	-
October	2	1	1	1	-
September	-	-	-	-	-
August	2	2	2	1	-
Hastings Div Utils	3	3	2	2	_***
December	-	-	-	-	-
November	2	2	1	1	-
October	-	-	-	-	-
September	-	-	-	-	-
August	1	1	1	1	-

Table 5: Analyst dividends forecast timing, by company and year

Source: Bloomberg

Notes: * Includes one forecast from June 2008. ** Includes one forecast from July 2008. *** No analyst forecasts reported, but Bloomberg reports a consensus forecast value.

141. On the basis of the data in Table 5, we consider it reasonable to assume that the Bloomberg consensus forecasts of future dividends represent a view formed in November 2008. Of the 156 individual analyst forecasts noted by Bloomberg, 98 (or 63%) were made in November 2008. In any event, the average of the November forecasts is fractionally higher (0.7%) than the average of the non-November forecasts. Thus, if we restricted our analysis to November forecasts



we would actually get a higher estimate of the required cost of equity in November.

142. Finally, share price information was also collected from Bloomberg for the month of November 2008. For each stock, a simple average of the last price for each day in November was taken to estimate this value. These average equity prices are shown in Table 6 below.

Equity prices
2.93
2.20
0.57
1.10
1.47
2.30

Table 6: Average equity prices for November 2008



Appendix C. Time series cost of equity for utilities

- 143. Similarly to the AMP method for deriving a time series of MRP, we have derived a daily time series of the cost of equity implied by the DGM analysis for the six ASX-listed companies that rely primarily on revenue from regulated gas or electricity infrastructure services. This analysis required the following inputs:
 - the daily share price of each of these companies;
 - past cash dividend payments made by these companies; and
 - forecasts of the future cash dividend yield.
- 144. Daily share price information has been sourced from Bloomberg, using closing share prices. We have only examined share price information beginning from 15 December 2005, which is the first day that a share price for Spark Infrastructure Group was recorded by Bloomberg. Our sample period ends on 3 December 2008.
- 145. Dividend forecasts have been obtained from Bloomberg for the 2009 through to 2013 financial years. The nature of the forecast dividend data is discussed in detail at Appendix B.
- 146. Past dividend payment information dating back to December 2005 has been collected from the ASX website. For completeness and transparency, we show in Table 7 below the date and amounts for dividend payments that we have used in this analysis. Note that Table 7 does not include actual dividend payments made after 30 June 2008, since these payments overlap with the 2009 financial year forecast dividend payments and hence inclusion of these would amount to double-counting of dividends.



Company	Dividend date	Dividend amount
APA	30/12/2005	6.00 cps
	30/03/2006	6.00 cps
	30/06/2006	6.00 cps
	29/09/2006	6.00 cps
	18/12/2006	7.00 cps
	30/03/2007	7.00 cps
	29/06/2007	7.00 cps
	28/09/2007	7.00 cps
	28/03/2008	14.50 cps
DUE	16/02/2006	11.75 cps
	17/08/2006	11.75 cps
	16/02/2007	12.25 cps
	17/08/2007	12.50 cps
	15/02/2008	13.50 cps
ENV	26/05/2006	3.80 cps
	30/11/2006	5.70 cps
	31/05/2007	3.80 cps
	30/11/2007	5.70 cps
	30/05/2008	3.80 cps
HDF	23/02/2006	6.09 cps
	28/04/2006	6.40 cps
	28/06/2006	6.40 cps
	27/10/2006	6.40 cps
	30/01/2007	6.40 cps
	27/04/2007	6.95 cps
	27/07/2007	6.65 cps
	26/10/2007	6.65 cps
	29/01/2008	6.65 cps
	28/04/2008	7.00 cps
SPN	26/06/2006	3.25 cps
	14/12/2006	5.635 cps
	28/06/2007	5.635 cps
	19/12/2007	5.776 cps
	23/06/2008	5.788 cps
SKI	15/03/2006	0.39 cps
	15/09/2006	7.11 cps
	15/03/2007	8.11 cps
	14/09/2007	8.53 cps
	14/03/2008	9.53 cps

Table 7: Dividend payments for regulated ASX-listed firms, 15 Dec 2005 – 30 June 2008

Source: ASX

147. Forecast dividend payments are assumed to be made in a single payment after the end of the financial year. Clearly this assumption will not always hold, but it

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will not result in an average bias to the results. These forecast payments are shown in Table 4 in Appendix B above.

- 148. The final dividend payment is assumed to grow by 2.5% in perpetuity and this is discounted to present value terms using the methodology discussed in Appendix A of this report. A cost of equity is derived for each stock, on each day, by determining the discount rate that sets the present value of future dividend payments, including the terminal payment, equal to the closing share price on that day.
- 149. We note that this implies perfect foresight of dividend payments over the period from 15 December 2005 to 30 June 2008, and some foresight of dividends between 1 July 2008 and 3 December 2008, to the extent that 2009 dividend forecasts reflect actual dividends already paid to that point. Clearly, perfect foresight is not a realistic assumption for any particular firm at any particular point in time. However, since the focus of our analysis is on six firms and a three-year time series of price data, one might expect that deviations between expected and actual future dividends might, on average over the sample, be of less importance.
- 150. For each day in the sample we take a simple average of the implied cost of equity for each of the six companies. For a very small number of days, only five companies were averaged due to a halt in trading for one of the sample. We do not consider this to have a significant effect on our results. This simple average cost of equity is scaled up by 21% to allow for the value of imputation credits, assuming the current NER parameter value for gamma of 0.5.⁴²
- 151. The time series of implied cost of equity is shown at Figure 3 above, against the regulatory cost of equity implied by the NER parameters. We have incorporated the AER's proposed revisions to these parameters in mid-November (rather than when the draft decision was published on 11 December) so that the relative effect of this can clearly be seen. The proposed changes that are material to the chart below include the revision of the equity beta from 1.0 to 0.8 and the changed proxy for the risk-free rate from 10 year CGS yields to 5 year CGS yields.
- 152. It is clear from Figure 3 that the discount rate applied by the market to equity stocks with predominantly regulated revenues has increased steadily over the past year and particularly sharply in recent months. By contrast, the regulated cost of equity has been falling with CGS yields, and the proposed AER changes will result in further significant fall away from the current market-determined cost of equity.

⁴² Calculated as $(1 - \tan rate * (1 - \operatorname{gamma})) / (1 - \tan rate) = 1 - 0.3 * (1 - 0.50)) / (1 - 0.3) = 1.21$