



# **AusNet Gas Services Pty Ltd**

## **Gas Access Arrangement Review 2018–2022**

### **Appendix 9F: Historic Reports on Return on Equity**

**Submitted: 16 December 2016**





COMPETITION  
ECONOMISTS  
GROUP

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# Replication and extension of Henry's beta analysis

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# 1 Executive summary

1. Johnson Winter & Slattery commissioned CEG to replicate and extend the beta analysis from Henry<sup>1</sup> (2014) to the most recent period (June 2015). Henry's original analysis was based on the daily closing price, historical market capitalisation and net debt value of a collection of nine stocks ending on 28 June 2013. We have extended Henry's sample to include an additional three year of data up until 18 June 2016.
2. Our replication results are derived by regressing return series we have constructed for the relevant assets/portfolios. These have been compared to, and found to be consistent with, the "Historical Beta" estimates sourced directly from the Bloomberg terminal using "ASX 300 accum<sup>2</sup>" as the benchmarking index. However, while our results are broadly similar to Henry's raw equity betas in his Appendix A there are some slight differences (as detailed below).
3. Our extension of Henry's analysis shows that the average re-levered equity beta has increase materially by 0.1 using the most recent five years of data. This reflects a number of factors including an increase/decrease in the raw equity betas/gearing ratios of the remaining listed stocks (APA, DUE, SKI, AST) and an increase in the weighting of high-beta stocks (e.g. APA) in the value-weighted portfolios.
4. We note that the measured increase in beta is consistent with the observation from our DBP report<sup>3</sup> which identifies a structural break in the average rolling beta series at 2014/15.
5. This report is structured as follows:
  - Section 3 replicates and extend Henry's analysis on individual firm betas;
  - Section 4 replicates and extend Henry's portfolio analysis;
  - Section 5 discusses the most recent 5 and 1 year estimates of the equity beta; and
  - The final section provides a summary of the replication and extension results.

## 1.1 Key results

6. Table 1 below summarises the result from our extension to Henry's individual stock beta analysis. This table is directly compared with Table 3-30 from the AusNet

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<sup>1</sup> Olan T. Henry, *Estimating  $\beta$ : An update*, April 2014

<sup>2</sup> The same benchmarking index used by Henry (2014).

<sup>3</sup> CEG, *Estimating beta to be used in the Sharpe-Lintner CAPM*, February 2016, Section 5

Services draft decision (July 2016). Evidence suggests that beta has increased around 0.10 or more since the end of Henry’s sampling period.

**Table 1: Summary of extension results for re-levered OLS weekly individual beta estimates**

	Longest available period	Longest available period (excl. tech boom and GFC)	Last five years
Henry original results	0.52	0.56	0.46
CEG extension results	0.60	0.66	0.65
<b>Change</b>	<b>0.08</b>	<b>0.10</b>	<b>0.19</b>

*Bloomberg data, CEG analysis*

7. It should be noted that Henry’s average “last five years” beta estimates includes six firms (APA, DUE, DNV, HDF, SKI and AST), among which ENV and HDF were delisted in 2013 and 2014, respectively. Including these two stocks at the time of our estimates (June 2016) would result in a considerably smaller number of observations than other stocks (169 for ENV and 75 for HDF as compared with 260 for others). Therefore, our “last five years” beta estimates is only averaged across the four currently listed firms as in Table 11.
8. Table 2 below shows the measured betas for the six portfolios as outlined in section 4.1 for the two sampling periods. Portfolios 1 to 4 have all have firms in them for which there is no additional data and, therefore, the change in beta estimates is muted (given that some firms have the same beta simply because there is no additional data). Portfolio 5 is the only portfolio comprised solely of firms with additional data (SKI, APA, ENV, DUE, AST). Portfolio 6 is added by CEG and is the same as Portfolio 5 but excludes Envestra which only has one year of additional data. Compared with Table 3-31 from the AusNet Services draft decision (July 2016), and focusing on portfolio 5, Table 14 suggests that average portfolio beta has increased by around 0.13 or more as a result of updating Henry’s analysis.



**Table 2: Summary of extension results for re-levered OLS weekly portfolio beta estimates**

	<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>P4</b>	<b>P5</b>	<b>P6</b>
<b>Equal weighted</b>						
Longest available period	0.52	0.56	0.52	0.53	0.52	0.54
Increase vs Henry	0.06	0.04	0.02	0.05	0.13	N/A
Longest available period (excl. tech boom and GFC)	0.56	0.56	0.58	0.61	0.61	0.64
Increase vs Henry	0.07	0.04	0.03	0.08	0.16	N/A
<b>Value weighted</b>						
Longest available period	0.61	0.76	0.44	0.46	0.54	0.55
Increase vs Henry	0.11	0.06	0.00	0.04	0.15	N/A
Longest available period (excl. tech boom and GFC)	0.66	0.76	0.53	0.56	0.65	0.66
Increase vs Henry	0.12	0.06	0.01	0.06	0.17	N/A

*Bloomberg data, CEG analysis*



## 2 Introduction

9. I have been asked by Johnson Winter & Slattery to provide a report on the replication and extension of the beta analysis from Henry<sup>4</sup> (2014) to the most recent period (June 2015).
10. The remainder of this report has the following structure:
  - Section 3 replicates and extend Henry's analysis on individual firm betas;
  - Section 4 replicates and extend Henry's portfolio analysis; and
  - Section 5 discusses the most recent 5 and 1 year estimates of the equity beta
11. I acknowledge that I have read, understood and complied with the Federal Court of Australia's Practice Note CM 7, "Expert Witnesses in Proceedings in the Federal Court of Australia". 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.
12. I have been assisted in the preparation of this report by Yanjun Liu in CEG's Sydney office. However, the opinions set out in this report are my own.



Thomas Nicholas Hird

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<sup>4</sup> Olan T. Henry, *Estimating  $\beta$ : An update*, April 2014

## 3 Individual stock beta

### 3.1 Sampling period

13. Table 3 below summarises our extended sampling period for Henry's (weekly) beta analysis. It can be seen that for the four stocks that are still listed (APA, DUE, SKI and AST), our analysis has included an additional 155 weekly observations while for ENV there was only 63 new data points as it was delisted in October 2014.

**Table 3: Extended sampling period of Henry's analysis**

Bloomberg ticker	Henry start date	Henry end date	Henry # of observations	CEG extended end date	CEG # of observations	Difference in # of observations
AAN AU Equity	20/10/2000	17/08/2007	356	-	356	0
AGL AU Equity	29/05/1992	6/10/2006	749	-	749	0
APA AU Equity	16/06/2000	28/06/2013	680	20/06/2016	835	155
DUE AU Equity	13/08/2004	28/06/2013	463	20/06/2016	618	155
ENV AU Equity	29/08/1997	28/06/2013	826	20/06/2016	889	63
GAS AU Equity	21/12/2001	10/11/2006	255	-	255	0
HDF AU Equity	17/12/2004	23/11/2012	414	-	414	0
SKI AU Equity	2/03/2007	28/06/2013	330	20/06/2016	485	155
AST AU Equity	16/12/2005	28/06/2013	393	20/06/2016	548	155

*Bloomberg data, CEG analysis*

14. It should be noted that the following stock ticker changes have occurred: AGL AU Equity was renamed from AGK AU Equity for AGL energy limited; and AST AU Equity is renamed from SPN AU Equity for SP Ausnet.

### 3.2 CEG replication of Henry's Table 2 and A1

15. Henry's Table 2 shows the de-levered/re-levered beta and Table A1 in his appendix shows the corresponding raw estimates of equity beta. In replicating these tables, we sourced historical closing price, market capitalisation and net debt for each of the nine firms in the sample. We then calculate various beta measures using the open source statistic software R.
16. The replication results are shown in Table 4 below. Consistent with Henry's notation, **w** stands for the re-levering factor<sup>5</sup> and gearing is calculated based on the average market capitalisation and net debt during the sampling period.

<sup>5</sup>  $W = (1 - \text{gearing}) / (1 - 0.6)$

**Table 4: CEG replication of weekly individual beta estimates (Henry's longest sampling period using weekly data)**

stock	equity beta	asset beta	w	gearing	re-levered equity beta_CEG (replication)	re-levered equity beta_Henry (actual)
AAN	0.570	0.380	1.567	0.373	0.893	0.880
AGL	0.383	0.265	1.738	0.305	0.666	0.681
APA	0.542	0.256	1.117	0.553	0.606	0.594
DUE	0.482	0.135	0.621	0.752	0.299	0.283
ENV	0.431	0.123	0.689	0.724	0.297	0.304
GAS	0.347	0.124	0.895	0.642	0.311	0.314
HDF	0.742	0.447	1.491	0.404	1.106	1.031
SKI	0.379	0.226	1.364	0.455	0.517	0.329
AST	0.294	0.120	0.995	0.602	0.292	0.287
<b>Average</b>	<b>0.460</b>	<b>0.230</b>	<b>1.160</b>	<b>0.530</b>	<b>0.554</b>	<b>0.522</b>

*Bloomberg data, CEG analysis*

17. The last two columns in Table 4 compares our replication and Henry's actual figure side-by-side for each individual stock. We note that our estimates are different to Henry's, most notably for SKI, although the average figure is similar.
18. To examine robustness of our estimates (and the discrepancy with Henry's estimates), we have compared our estimates with the "Raw beta" from Bloomberg's "Historical Beta" field<sup>6</sup> and found that our estimates are consistent with the figures from Bloomberg based on Henry's sample and benchmark index (ASX 300 accum); while Henry's raw beta from his Table A1 is slightly different.
19. We note that most of the difference in re-levered equity is due to differences in gearing estimates. For example, for SKI our gearing figure is 45.5% while Henry's is 66%. Similarly, our gearing estimate for HDF is materially lower (40% vs 48%). We have very similar gearing estimates for the other firms.
20. However, given our result is consistent with Bloomberg's figures and the difference in average is minimal, we have used our replication as the reference to compare with the results from the extended sample in the following sections.

### 3.3 CEG extension of Henry's Table 2 (as of June 2016)

21. Table 5 below shows our extension to Henry's Table 2. The red column corresponds to our replication of Henry's figure in Table 4 while the blue column shows the

<sup>6</sup> Screenshots included in Appendix A.

estimated (re-levered) equity beta based on the extended sample; the last column calculates the difference.

**Table 5: CEG extension of weekly individual beta estimates (Henry's longest sampling period extended until June 2016 using weekly data)**

stock	equity beta	asset beta	w	gearing	re-levered equity beta_CEG (replication)	re-levered equity beta_CEG (extension)	change
AAN	0.570	0.380	1.567	0.373	0.893	0.893	0.000
AGL	0.383	0.265	1.738	0.305	0.666	0.666	0.000
APA	0.566	0.268	1.241	0.504	0.606	0.703	0.097
DUE	0.458	0.129	0.737	0.705	0.299	0.337	0.038
ENV	0.433	0.124	0.737	0.705	0.297	0.319	0.023
GAS	0.347	0.124	0.895	0.642	0.311	0.311	0.000
HDF	0.742	0.447	1.491	0.404	1.106	1.106	0.000
SKI	0.421	0.250	1.545	0.382	0.517	0.650	0.133
AST	0.364	0.149	1.035	0.586	0.292	0.377	0.085
<b>Average</b>	<b>0.480</b>	<b>0.240</b>	<b>1.220</b>	<b>0.510</b>	<b>0.554</b>	<b>0.596</b>	<b>0.042 – 0.088*</b>

Bloomberg data, CEG analysis. \* The bottom end of this range shows the change measured as the average across all betas – including for those that have no additional data and, therefore, have no change. The top end of this range is the change only for the four firms currently listed (i.e., the firms for which there is 3 years additional data which do not include ENV for which there is only an additional 13 months of data).

22. Our result suggests that the average re-levered equity beta has increased by around 0.04 simply by adding data since the end of Henry's sampling period in mid 2013 (or an increase of around 0.09 if we focus only on the firms for which 3 years of additional data is available).

## 4 Portfolio beta

### 4.1 Portfolio construction

23. Following the instructions from the AER, Henry (2014) constructed five portfolios each with different constituent stocks and sampling period<sup>7</sup>. In addition to these five portfolios, our portfolio analysis includes a sixth portfolio consists of the remaining four listed stocks (APA, DUE, SKI and AST) as ENV was delisted in 2014.
24. Table 6 below summarises the constituent stocks and sampling periods for our portfolio analysis. It can be seen P2-P4 are not affected by the extension as their portfolio end date is set to be before 2013.

**Table 6: Portfolio construction and sampling period**

Portfolio	Constituent stocks	Henry start date	Henry end date	Henry # of observations	CEG end date	CEG # of observations
P1	APA, ENV	16/06/2000	28/06/2013	680	20/06/2016	789
P2	AAN, AGL, APA, ENV, GAS	21/12/2001	06/10/2006	250	06/10/2006	250
P3	APA, DUE, ENV, HDF, AST	16/12/2005	23/11/2012	362	23/11/2012	362
P4	APA, DUE, ENV, HDF, SKI, AST	02/03/2007	23/11/2012	299	23/11/2012	299
P5	APA, DUE, ENV, SKI, AST	02/03/2007	28/06/2013	330	20/06/2016	467 <sup>8</sup>
P6	APA, DUE, SKI, AST	02/03/2007	28/06/2013	330	20/06/2016	485

Bloomberg data, CEG analysis

### 4.2 CEG replication and extension of Henry's Table 14 and A4

25. Henry's Table 14 and A4 document the beta estimates for five *equal*-weighted portfolio consists of different stocks and sampling periods. This section attempts to replicate his results.

<sup>7</sup> Olan T. Henry, *Estimating  $\beta$ : An update*, April 2014, P. 35

<sup>8</sup> ENV was delisted in 2014 so the # of observations is different for ENV and the remaining four stocks in P5.

26. As noted before, our beta estimates are slightly different from Henry's results. Table 7 below shows our replication result side-by-side with Henry's estimates for the equal-weighted portfolios. Note that Henry has only five portfolios while we have six. The different in average (re-levered) equity beta is around 0.03.

**Table 7: CEG replication of weekly equal-weighted portfolio beta**

Portfolio	equity beta	asset beta	w	gearing	re-levered equity beta_CEG (replication)	re-levered equity beta_Henry (actual)
p1	0.505	0.187	0.911	0.636	0.460	0.458
p2	0.441	0.240	1.264	0.495	0.557	0.520
p3	0.531	0.219	0.977	0.609	0.519	0.504
p4	0.514	0.218	1.026	0.589	0.528	0.476
p5	0.461	0.175	0.969	0.613	0.446	0.387
p6	0.445	0.179	1.020	0.592	0.454	-
<b>Average<sup>9</sup></b>	<b>0.490</b>	<b>0.208</b>	<b>1.029</b>	<b>0.588</b>	<b>0.502</b>	<b>0.469</b>

Bloomberg data, CEG analysis

27. Consistent with the approach adopted in the previous section, we use our replication as the reference to compare with the results from the extended sample in the following sections.
28. Table 8 below shows our extension of Henry's Table 16. The red column is our replication of Henry's figure while the blue column corresponds to the estimated (re-levered) equity beta based on the extended sample.

**Table 8: CEG extension of weekly equal-weighted portfolio beta**

Portfolio	equity beta	asset beta	w	gearing	re-levered equity beta_CEG (replication)	re-levered equity beta_CEG (extension)	change
p1	0.518	0.211	0.998	0.601	0.460	0.517	0.057
p2	0.441	0.240	1.264	0.495	0.557	0.557	0.000
p3	0.531	0.219	0.977	0.609	0.519	0.519	0.000
p4	0.514	0.218	1.026	0.589	0.528	0.528	0.000
p5	0.482	0.209	1.087	0.565	0.446	0.524	0.078
p6	0.471	0.217	1.148	0.541	0.454	0.541	0.087
<b>Average</b>	<b>0.493</b>	<b>0.219</b>	<b>1.083</b>	<b>0.567</b>	<b>0.494</b>	<b>0.531</b>	<b>0.037-0.074*</b>

Bloomberg data, CEG analysis. Bloomberg data, CEG analysis. \* The bottom end of this range shows the change measured as the average across all betas – including for those that have no additional data and,

<sup>9</sup> Portfolio 6 is excluded in the average as this portfolio is not included in Henry's (2014) analysis.

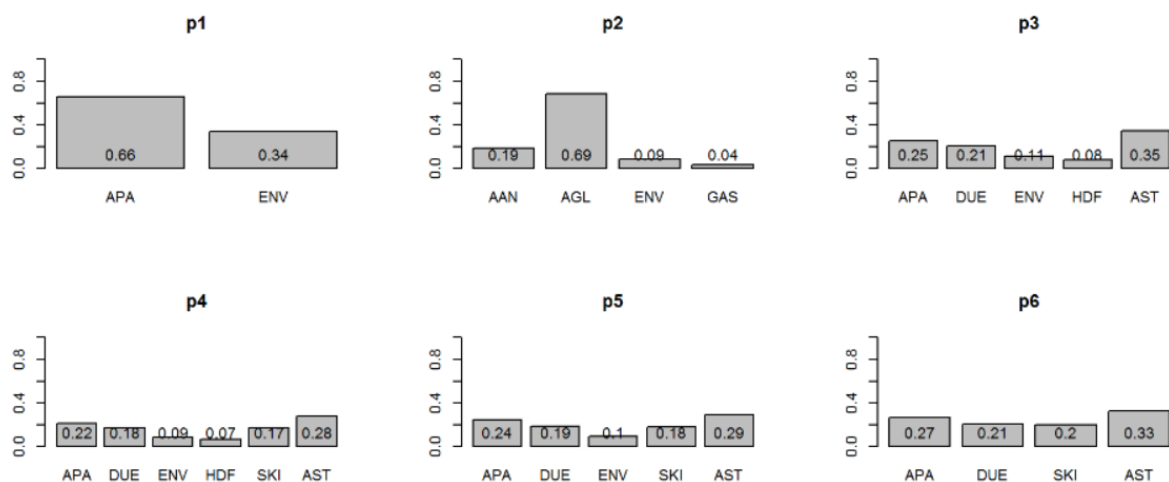
therefore, have no change. The top end of this range is the change only for the three portfolios for which there is additional data).

29. Consistent with the result from Table 5, Table 8 shows that the average beta has increased by around 0.04 since the end of Henry's sample period (or an increase of around 0.07 if we focus only on the portfolios for which additional data is available)..

### 4.3 CEG replication and extension of Henry's Table 16 and A6

30. Henry's Table 16 and A6 present the beta estimates for five *value*-weighted portfolios consisting of different stocks and sampling periods. To replicate his result we must calculate the weight for each constituent stock in the portfolios based on their average market capitalisation in the sampling period.
31. Figure 1 below shows the calculated weights for each of the stocks in their corresponding portfolios based on the "Hist\_mkt\_cap" field from Bloomberg. We note that these weighting are close, albeit not identical, to the weights used by Henry<sup>10</sup> (2014).

**Figure 1: CEG replication of weights in value-weighted portfolios**



Bloomberg data, CEG analysis

<sup>10</sup> Olan T. Henry, *Estimating  $\beta$ : An update*, April 2014, Annex A.

32. Table 9 below shows our replication result side-by-side with Henry's estimates for the value-weighted portfolios. We note that the difference between our replication and Henry's actual figure is 0.03, on average.

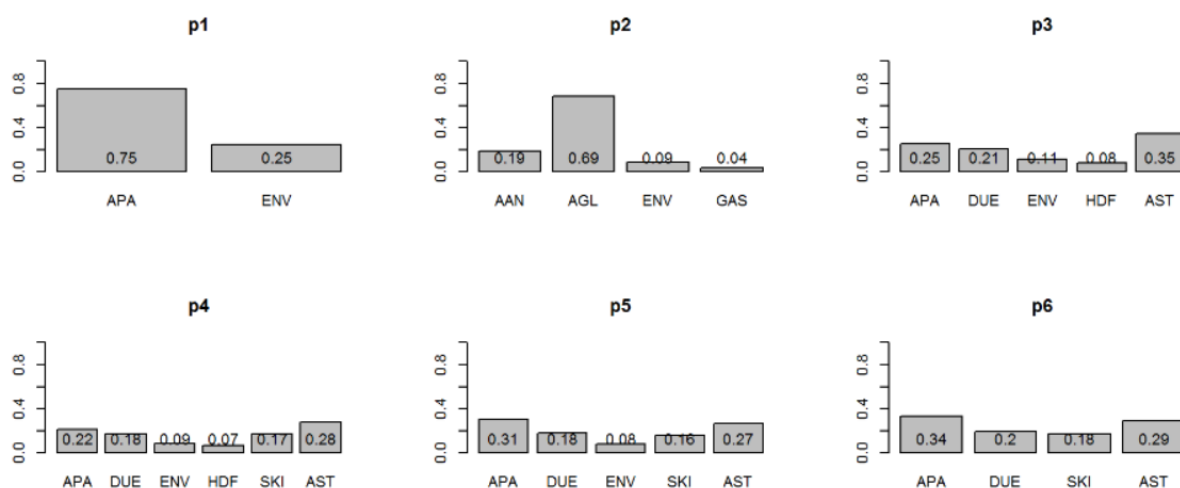
**Table 9: CEG replication of weekly value-weighted portfolio beta**

Portfolio	equity beta	asset beta	w	gearing	re-levered equity beta_CEG (replication)	re-levered equity beta_Henry (actual)
p1	0.517	0.205	0.977	0.609	0.505	0.498
p2	0.459	0.307	1.653	0.339	0.758	0.703
p3	0.469	0.181	0.939	0.625	0.441	0.436
p4	0.463	0.187	0.999	0.600	0.463	0.420
p5	0.446	0.175	0.994	0.602	0.443	0.390
p6	0.438	0.177	1.019	0.593	0.446	
<b>Average<sup>11</sup></b>	<b>0.471</b>	<b>0.211</b>	<b>1.112</b>	<b>0.555</b>	<b>0.522</b>	<b>0.489</b>

*Bloomberg data, CEG analysis*

33. Following Henry's approach, we have calculated the portfolio weights to be applied in the extended sampling periods. This is shown in Figure 2 below. Compared with Figure 1, Figure 2 shows that the average market capitalisation for APA has increased relative to other stocks. As a consequence, its weight in portfolio p1, p5 and p6 has been lifted.

**Figure 2: CEG extension of weights in value-weighted portfolios**



*Bloomberg data, CEG analysis*

<sup>11</sup> Portfolio 6 is excluded in the average as this portfolio is not included in Henry's (2014) analysis.



34. Table 10 below shows our extension to Henry's Table 16. The red column corresponds our replication of Henry's figure while the blue column shows the estimated (re-levered) equity beta based on the extended sample.

**Table 10: CEG extension of weekly value-weighted portfolio beta**

Portfolio	equity beta	asset beta	w	gearing	re-levered equity beta_CEG (replication)	re-levered equity beta_CEG (extension)	change
p1	0.542	0.246	1.120	0.552	0.505	0.607	0.102
p2	0.459	0.307	1.653	0.339	0.758	0.758	0.000
p3	0.469	0.181	0.939	0.625	0.441	0.441	0.000
p4	0.463	0.187	0.999	0.600	0.463	0.463	0.000
p5	0.487	0.219	1.118	0.553	0.443	0.544	0.101
p6	0.484	0.223	1.142	0.543	0.446	0.552	0.107
<b>Average</b>	<b>0.484</b>	<b>0.227</b>	<b>1.162</b>	<b>0.535</b>	<b>0.509</b>	<b>0.561</b>	<b>0.052 - 0.103*</b>

Bloomberg data, CEG analysis. \* The bottom end of this range shows the change measured as the average across all betas – including for those that have no additional data and, therefore, have no change. The top end of this range is the change only for the three portfolios for which there is additional data).

35. Consistent with results from Table 5 and Table 8, Table 10 shows that the de-levered/re-levered equity beta has increase by 0.05 on average (or an increase of around 0.10 if we focus only on the portfolios for which additional data is available).

## 5 Most recent beta

### 5.1 Last five years beta (Henry's Table 4 and A3)

36. Henry's Table 4 and A3 shows his estimates of the weekly beta for the "last five year". To draw a comparison, we have also estimated the re-levered equity beta for the most recent 261 weeks. Results are shown in Table 11 below<sup>12</sup>.

**Table 11: CEG extension of weekly individual beta estimates for the most recent 5 years**

Portfolio	equity beta	asset beta	w	gearing	re-levered equity beta_Henry (actual)	re-levered equity beta_CEG (extension)	change
APA	0.547	0.298	1.361	0.456	0.540	0.745	0.205
DUE	0.274	0.096	0.877	0.649	0.244	0.240	-0.004
SKI	0.478	0.345	1.800	0.280	0.299	0.861	0.563
AST	0.691	0.297	1.073	0.571	0.273	0.741	0.469
<b>Average</b>	<b>0.498</b>	<b>0.259</b>	<b>1.278</b>	<b>0.489</b>	<b>0.339</b>	<b>0.647</b>	<b>0.308</b>

*Bloomberg data, CEG analysis*

37. Apart from DUE which experienced a minimal decline, the 5-year weekly beta for the remaining three stocks have all increased considerably, almost doubling on average. We note that the rise in beta is much more apparent when examining the last 5 years because the "longest possible sample" analysis due to the relatively small weight additional data receives in the longer historical estimates.

### 5.2 Last one year beta

38. As noted in our DBP report<sup>13</sup>, a 5 year equity beta gives less weight to the most recent data and so will typically rise/fall more slowly after the point at which beta in the market rises/falls. To illustrate, Table 12 below shows our estimates of the weekly beta for the most recent 52 weeks. It can be seen that the increase in beta (comparing 1 year estimates to Henry's five year estimates) is around 0.13 (Table 12 vs Table 11).

<sup>12</sup> ENV and HDF are not included because they were delisted thus had considerably less amount of observations.

<sup>13</sup> CEG, Estimating beta to be used in the Sharpe-Lintner CAPM, February 2016, Para. 115



**Table 12: CEG extension of weekly individual beta estimates for the most recent 52 weeks**

Portfolio	equity beta	asset beta	w	gearing	re-levered equity beta_CEG (extension)	Change (with respect to Henry's five year beta)
APA	0.669	0.343	1.282	0.487	0.858	0.318
DUE	0.308	0.135	1.097	0.561	0.337	0.093
SKI	0.625	0.462	1.847	0.261	1.154	0.855
AST	0.699	0.300	1.074	0.570	0.750	0.478
<b>Average</b>	<b>0.575</b>	<b>0.310</b>	<b>1.325</b>	<b>0.470</b>	<b>0.775</b>	<b>0.436</b>

*Bloomberg data, CEG analysis*

## 6 Summary of replication and extension results

39. We have also replicated and extended Henry's table 3, 7, 15, 17, A2, A5 and A7 associated the sampling period excluding the technology boom (prior to 2002) and the GFC period (29/08/2008 to 06/11/2009). The detailed results are can be found in Appendix B.
40. Table 13 below summarises the result from our extension to Henry's individual stock beta analysis. This table is directly compared with Table 3-30 from the AusNet Services draft decision (July 2016). This evidence suggests that beta has increased around 0.10 or more since the end of Henry's sampling period.

**Table 13: Summary of extension results for re-levered OLS weekly individual beta estimates**

	Longest available period	Longest available period (excl. tech boom and GFC)	Last five years
Henry original results	0.52	0.56	0.46
CEG extension results	0.60	0.66	0.65
<b>Change</b>	<b>0.08</b>	<b>0.10</b>	<b>0.19</b>

*Bloomberg data, CEG analysis*

41. It should be noted that Henry's average "last five years" beta estimates includes six firms (APA, DUE, DNV, HDF, SKI and AST), among which ENV and HDF were delisted in 2013 and 2014, respectively. Including these two stocks at the time of our estimates (June 2016) would result in a considerably less number of observations than other stocks (169 for ENV and 75 for HDF as compared with 260 for others). Therefore, our "last five years" beta estimates is only averaged across the four currently listed firms as in Table 11.
42. Table 14 below shows the measured betas for the six portfolios as outlined in section 5 for the two sampling periods. Portfolio 5 is the only portfolio comprised of firms with additional data (portfolio 6 is added by CEG and is the same as Portfolio 5 but excludes Envestra). Compared with Table 3-31 from the AusNet Services draft decision (July 2016), and focusing on portfolio 5, Table 14 suggests that average portfolio betas has since then increased by around 0.13 or more (focusing on portfolio 5).

**Table 14: Summary of extension results for re-levered OLS weekly portfolio beta estimates**

	P1	P2	P3	P4	P5	P6 <sup>14</sup>
<b>Equal weighted</b>						
Longest available period	0.52	0.56	0.52	0.53	0.52	0.54
Increase vs Henry	0.06	0.04	0.02	0.05	0.13	N/A
Longest available period (excl. tech boom and GFC)	0.56	0.56	0.58	0.61	0.61	0.64
Increase vs Henry	0.07	0.04	0.03	0.08	0.16	N/A
<b>Value weighted</b>						
Longest available period	0.61	0.76	0.44	0.46	0.54	0.55
Increase vs Henry	0.11	0.06	0.00	0.04	0.15	N/A
Longest available period (excl. tech boom and GFC)	0.66	0.76	0.53	0.56	0.65	0.66
Increase vs Henry	0.12	0.06	0.01	0.06	0.17	N/A

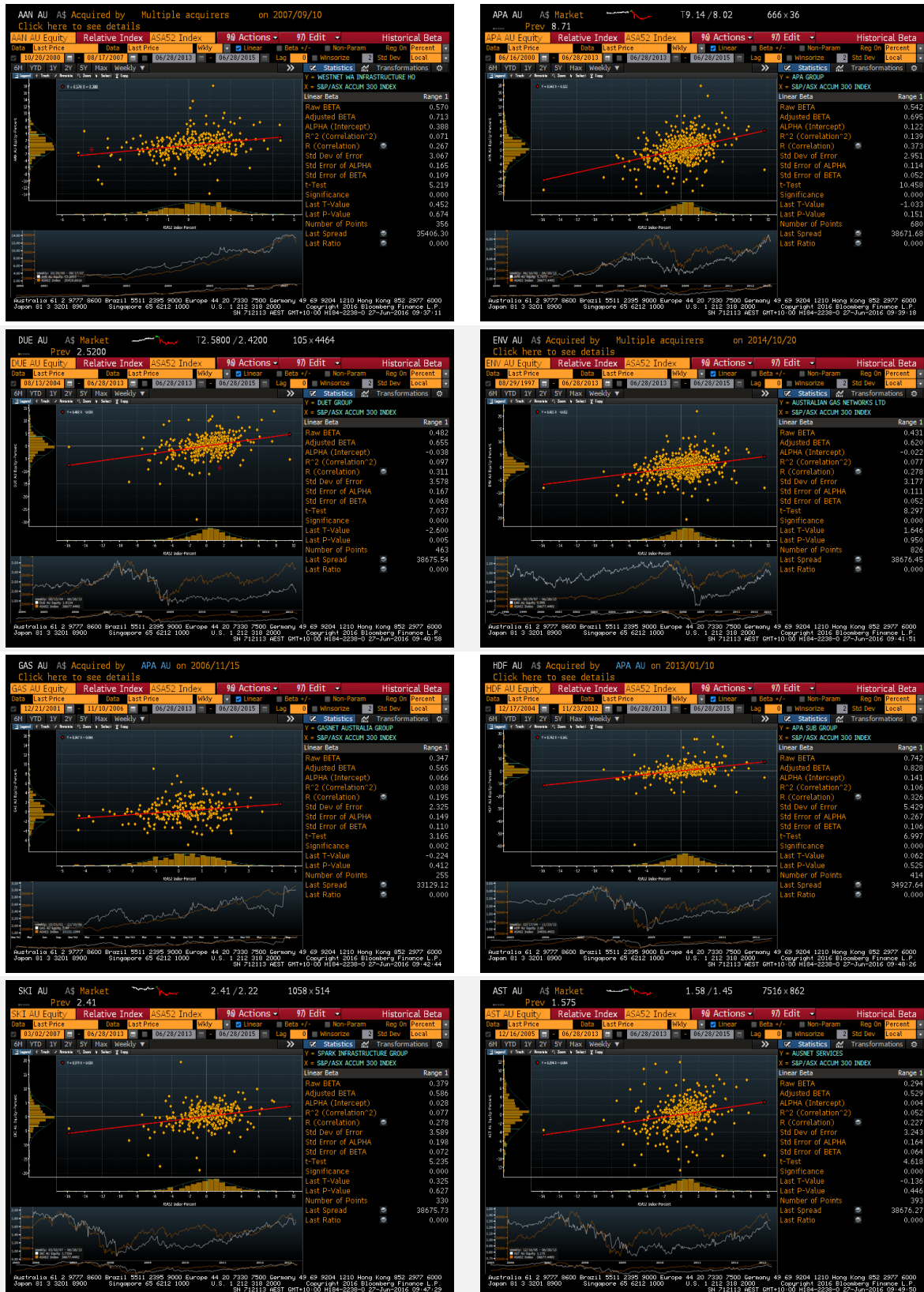
*Bloomberg data, CEG analysis*

<sup>14</sup> Comparisons are made against replication of Henry (2014), because this portfolio is not included in Henry's (2004) analysis.

## Appendix A Bloomberg historical beta screenshots

43. Figure 3 shows a number of screenshots from the Bloomberg “Historical beta” field for AAN, APA, DUE, ENU, GAS, HDF, SKI and AST. The “Raw Beta” in the right sidebar column can be compared directly with “equity beta” column in Table 4 of this report. This demonstrates that our estimates of the equity beta is consistent with Bloomberg’s measure while being slightly different to the figures in Henry (2014).

**Figure 3: Bloomberg historical beta screenshots**



## Appendix B CEG replication and extension of Henry's beta analysis for the period after the technology boom but excluding the GFC

### B.1 Individual stocks beta

#### B.1.1 CEG replication of Henry's Table 3 and A2

stock	equity beta	asset beta	w	gearing	re-levered equity beta_CEG (replication)	re-levered equity beta_Henry (actual)
AAN	0.644	0.429	1.567	0.373	1.009	0.996
AGL	0.427	0.295	1.821	0.272	0.777	0.750
APA	0.572	0.277	1.160	0.536	0.663	0.635
DUE	0.504	0.146	0.635	0.746	0.320	0.299
ENV	0.476	0.139	0.756	0.698	0.360	0.366
GAS	0.351	0.125	0.895	0.642	0.314	0.317
HDF	0.684	0.426	1.524	0.390	1.043	0.905
SKI	0.383	0.236	1.422	0.431	0.544	0.340
AST	0.464	0.194	1.024	0.591	0.475	0.468
<b>Average</b>	<b>0.500</b>	<b>0.250</b>	<b>1.200</b>	<b>0.520</b>	<b>0.610</b>	<b>0.564</b>

*Bloomberg data, CEG analysis*



### B.1.2 CEG extension of Henry's Table 3 and A2

stock	equity beta	asset beta	w	gearing	re-levered equity beta_CEG (replication)	re-levered equity beta_CEG (extension)	change
AAN	0.644	0.429	1.567	0.373	1.009	1.009	0.000
AGL	0.427	0.295	1.815	0.274	0.774	0.774	0.000
APA	0.604	0.293	1.273	0.491	0.663	0.768	0.105
DUE	0.462	0.133	0.757	0.697	0.320	0.350	0.030
ENV	0.479	0.140	0.810	0.676	0.360	0.388	0.028
GAS	0.351	0.125	0.895	0.642	0.314	0.314	0.000
HDF	0.684	0.426	1.524	0.390	1.043	1.043	0.000
SKI	0.448	0.276	1.604	0.359	0.544	0.718	0.174
AST	0.528	0.221	1.055	0.578	0.475	0.557	0.082
<b>Average</b>	<b>0.510</b>	<b>0.260</b>	<b>1.260</b>	<b>0.500</b>	<b>0.610</b>	<b>0.660</b>	<b>0.050</b>

Bloomberg data, CEG analysis

## B.2 Portfolio beta

### B.2.1 CEG replication of Henry's Table 15 and A5

Portfolio	equity beta	asset beta	w	gearing	re-levered equity beta_CEG (replication)	re-levered equity beta_Henry (actual)
p1	0.524	0.205	0.958	0.617	0.502	0.493
p2	0.442	0.240	1.264	0.494	0.559	0.521
p3	0.576	0.243	1.012	0.595	0.583	0.550
p4	0.566	0.247	1.068	0.573	0.605	0.532
p5	0.524	0.208	1.012	0.595	0.530	0.454
p6	0.521	0.216	1.061	0.576	0.553	-
<b>Average<sup>15</sup></b>	<b>0.526</b>	<b>0.229</b>	<b>1.063</b>	<b>0.575</b>	<b>0.556</b>	<b>0.510</b>

Bloomberg data, CEG analysis

<sup>15</sup> Portfolio 6 is excluded in the average as this portfolio is not included in Henry's (2014) analysis.

## B.2.2 CEG extension of Henry's Table 15 and A5

Portfolio	equity beta	asset beta	w	gearing	re-levered equity beta_CEG (replication)	re-levered equity beta_CEG (extension)	change
p1	0.541	0.231	1.041	0.584	0.502	0.564	0.062
p2	0.442	0.240	1.264	0.494	0.559	0.559	0.000
p3	0.576	0.243	1.012	0.595	0.583	0.583	0.000
p4	0.566	0.247	1.068	0.573	0.605	0.605	0.000
p5	0.540	0.243	1.126	0.550	0.530	0.608	0.078
p6	0.541	0.255	1.183	0.527	0.553	0.640	0.087
<b>Average</b>	<b>0.534</b>	<b>0.243</b>	<b>1.116</b>	<b>0.554</b>	<b>0.555</b>	<b>0.593</b>	<b>0.038</b>

Bloomberg data, CEG analysis

## B.2.3 CEG replication of Henry's Table 17 and A7

Portfolio	equity beta	asset beta	w	gearing	re-levered equity beta_CEG (replication)	re-levered equity beta_Henry (actual)
p1	0.539	0.223	1.020	0.592	0.549	0.536
p2	0.458	0.307	1.654	0.339	0.757	0.702
p3	0.548	0.219	0.975	0.610	0.534	0.517
p4	0.543	0.226	1.040	0.584	0.565	0.503
p5	0.530	0.216	1.035	0.586	0.548	0.476
p6	0.529	0.221	1.059	0.576	0.560	-
<b>Average<sup>16</sup></b>	<b>0.524</b>	<b>0.238</b>	<b>1.145</b>	<b>0.542</b>	<b>0.591</b>	<b>0.547</b>

Bloomberg data, CEG analysis

<sup>16</sup> Portfolio 6 is excluded in the average as this portfolio is not included in Henry's (2014) analysis.

## B.2.4 CEG extension of Henry's Table 17 and A7

Portfolio	equity beta	asset beta	w	gearing	re-levered equity beta_CEG (replication)	re-levered equity beta_CEG (extension)	change
p1	0.572	0.269	1.157	0.537	0.549	0.662	0.113
p2	0.458	0.307	1.654	0.339	0.757	0.757	0.000
p3	0.548	0.219	0.975	0.610	0.534	0.534	0.000
p4	0.543	0.226	1.040	0.584	0.565	0.565	0.000
p5	0.561	0.260	1.153	0.539	0.548	0.647	0.099
p6	0.564	0.266	1.176	0.530	0.560	0.663	0.103
<b>Average</b>	<b>0.541</b>	<b>0.258</b>	<b>1.192</b>	<b>0.523</b>	<b>0.586</b>	<b>0.638</b>	<b>0.052</b>

Bloomberg data, CEG analysis

## B.3 Most recent beta

### B.3.1 Last five year beta (Henry's Table 7)

Portfolio	equity beta	asset beta	w	gearing	re-levered equity beta_Henry (actual)	re-levered equity beta_CEG (extension)	change
APA	0.817	0.445	1.361	0.817	0.772	1.111	0.340
DUE	0.398	0.140	0.877	0.398	0.318	0.349	0.031
SKI	0.151	0.108	1.800	0.151	0.207	0.271	0.064
AST	0.688	0.295	1.073	0.688	0.361	0.738	0.377
<b>Average</b>	<b>0.513</b>	<b>0.247</b>	<b>1.278</b>	<b>0.513</b>	<b>0.414</b>	<b>0.617</b>	<b>0.203</b>

Bloomberg data, CEG analysis

### B.3.2 Last one year beta

Portfolio	equity beta	asset beta	w	gearing	re-levered equity beta_CEG (extension)	Change (with respect to Henry's five year beta)
APA	0.814	0.417	1.282	0.487	1.043	0.271
DUE	0.435	0.191	1.097	0.561	0.477	0.159
SKI	0.300	0.221	1.847	0.261	0.554	0.346
AST	0.602	0.259	1.074	0.570	0.646	0.286
<b>Average</b>	<b>0.537</b>	<b>0.272</b>	<b>1.325</b>	<b>0.470</b>	<b>0.680</b>	<b>0.266</b>

Bloomberg data, CEG analysis



# **The market risk premium**

REPORT PREPARED FOR AGN, MULTINET GAS, AUSNET  
TRANSMISSION AND AUSNET GAS

September 2016



# The market risk premium

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# 1 Executive summary

1 Frontier Economics has been retained by AGN, Multinet Gas, AusNet Transmission and AusNet Gas to provide our views on the approach to estimating the market risk premium (MRP) for use in the Capital Asset Pricing Model (CAPM).

## 1.1 Author of report

2 This report has been authored by Professor Stephen Gray, Professor of Finance at the UQ Business School, University of Queensland and Director of Frontier Economics, a specialist economics and corporate finance consultancy. I have Honours degrees in Commerce and Law from the University of Queensland and a PhD in Financial Economics from Stanford University. I teach graduate level courses with a focus on cost of capital issues, I have published widely in high-level academic journals, and I have more than 15 years' experience advising regulators, government agencies and regulated businesses on cost of capital issues. I have published several papers on various aspects of the estimation of the weighted-average cost of capital. A copy of my curriculum vitae is attached as an appendix to this report.

3 My opinions set out in this report are based on the specialist knowledge acquired from my training and experience set out above. I have been provided with 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). I have read, understood and complied with the Expert Witness Guidelines.

## 1.2 Primary conclusions

4 Our primary conclusions are set out below.

### ***The regulatory task***

5 The MRP varies over time and that the regulatory task is to adopt a forward-looking estimate of the MRP that is commensurate with the prevailing conditions in the market for equity funds.

### ***The Guideline approach***

6 The approach to estimating the MRP that is set out in the AER's Rate of Return Guideline is to give:

- a. Greatest<sup>1</sup> consideration to the long-run mean of historical excess returns;

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<sup>1</sup> AER Rate of Return Guideline, Explanatory Statement, p. 95.



- b. Significant<sup>2</sup> consideration to its DGM estimates; and
- c. Some<sup>3</sup> or limited<sup>4</sup> consideration to other evidence including surveys, independent expert reports, conditioning variables, and other regulators' allowances.

7 The Guideline approach to setting the MRP allowance involves two steps:

- a. Set a range based on the aggregated ranges of its historical excess returns and DGM estimates; and
- b. Select a point estimate from within that range.

8 In its Guideline, the AER set the allowed MRP to 6.5% on the basis that:

This point estimate lies between the historical average range and the range of estimates produced by the DGM. This reflects our consideration of the strengths and limitations of each source of evidence.<sup>5</sup>

### ***How the Guideline approach achieves the regulatory task***

9 The historical excess returns approach estimates the MRP by taking the mean excess return over a long historical period. Self-evidently, this estimate must reflect the average market conditions over the historical period that was used. Logically, this approach can only produce a forward-looking estimate that is commensurate with the prevailing conditions in the market in two circumstances:

- a. Investors always require the same MRP in all market conditions; or
- b. The current market conditions are the same as the average market conditions over the historical period.<sup>6</sup>

10 Neither of these conditions is likely to hold. The AER has stated that it does not consider that the MRP is the same in all market conditions, and the current conditions are quite unlike the average historical conditions in that the current government bond yield (to which the MRP is added to produce the allowed return on equity) is at historical lows.

11 By contrast, there is broad agreement that the DGM method does produce a forward-looking MRP that is commensurate with the prevailing conditions in the market for equity funds. The AER has stated that:

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<sup>2</sup> AER Rate of Return Guideline, Explanatory Statement, p. 97.

<sup>3</sup> AER Rate of Return Guideline, Explanatory Statement, p. 97.

<sup>4</sup> AER Rate of Return Guideline, Explanatory Statement, p. 97.

<sup>5</sup> AER Rate of Return Guideline, Explanatory Statement, p. 97.

<sup>6</sup> The point we are making here is that one of these two conditions must hold for the historical mean estimate to also be a forward-looking estimate that is commensurate with the prevailing conditions. A different argument is that the historical mean estimate might still be given some weight, even though it is not a forward-looking estimate, because the forward-looking estimates that are available are not sufficiently reliable to be relied on exclusively.

...we consider DGM estimates have strong theoretical grounding and are more likely to reflect prevailing market conditions than other approaches.<sup>7</sup>

12 Indeed, the AER itself distinguishes between its historical MRP estimates on the one hand and its forward-looking DGM estimates on the other:

...we used results from both forward looking methods and historical averaging of excess returns for estimating the MRP and the results from forward looking methods unambiguously constitute estimates of the prevailing rather than the long-term average value for the MRP.<sup>8</sup>

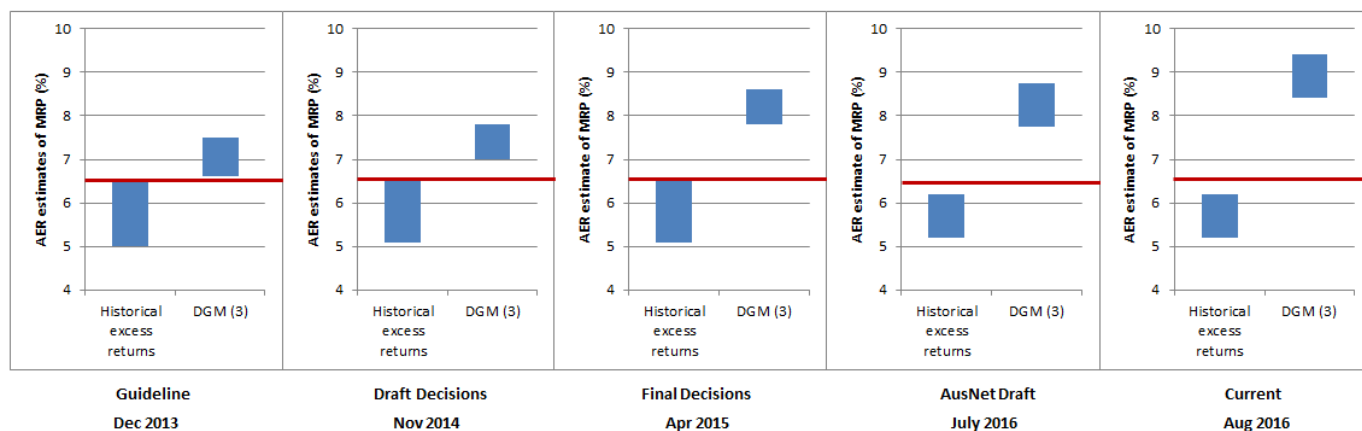
13 The AER goes on to conclude that the only reason that there is any need to rely on mean historical excess return estimates is due to concerns about relying exclusively on the forward-looking DGM estimate:

If a perfectly reliable estimate of the MRP could be generated from market prices it would be reasonable to use this estimate. However, no such estimate exists.<sup>9</sup>

### **The evolution of the AER's evidence**

14 The evolution of the AER's primary MRP estimates and the AER's MRP allowance is summarised in Figure 1 below.

Figure 1: The AER's primary MRP estimates



Source: Rate of Return Guideline; Ausgrid Draft Decision; Ausgrid Final Decision; AusNet Draft Decision; Current estimate using risk-free rate of 1.9%.

15 By construction, the historical excess returns estimate is effectively constant over time and is independent of the prevailing conditions in the market. However, the AER's DGM estimates of the MRP have increased materially since the Guideline and are currently higher than at any time since the Guideline. Although the AER has recently stated that there is no reason to decrease the weight applied to its DGM evidence,<sup>10</sup> the allowed MRP has remained fixed at 6.5%, even as the DGM evidence has become more and more inconsistent with that figure.

<sup>7</sup> AER (2013), Rate of Return Guideline: Explanatory Statement, Appendices, p. 85.

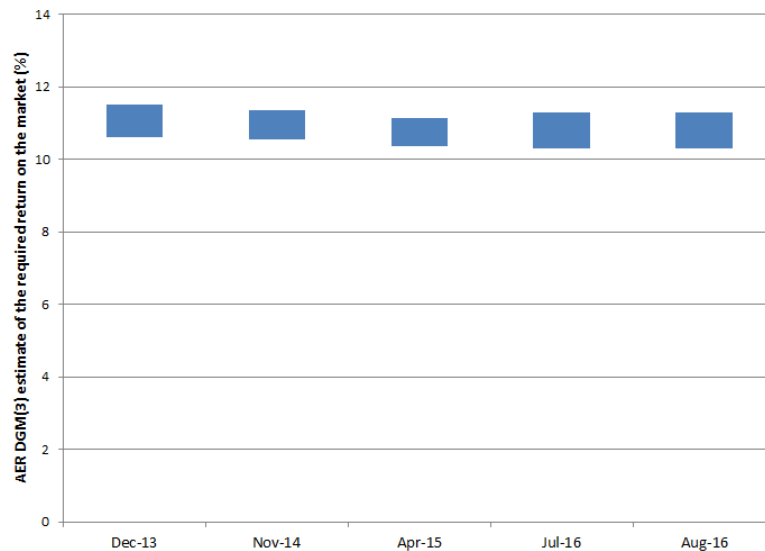
<sup>8</sup> AER (2013), Rate of Return Guideline: Explanatory Statement, Appendices, p. 103.

<sup>9</sup> AER (2013), Rate of Return Guideline: Explanatory Statement, Appendices, p. 110.

<sup>10</sup> AusNet Draft Decision, Attachment 3, p. 207.

- 16 The reason for the increase in the AER's DGM estimate of the MRP is that the evidence suggests that the overall required return on equity has remained remarkably stable since the Guideline, even as government bond yields have fallen sharply. This is illustrated in Figure 2 below.

Figure 2: AER three-stage DGM estimates of the required return on the market



Source: AER Rate of Return Guideline; AER Ausgrid Draft Decision; AER Ausgrid Final Decision; AER AusNet Draft Decision; Frontier Economics updated calculations.

### **The reduction in weight applied to the DGM evidence**

- 17 Figure 1 shows that, since the publication of its Guideline, the AER has reduced the weight that it has applied to its own DGM estimates of the MRP. The AER's DGM estimates of the MRP have increased substantially because:

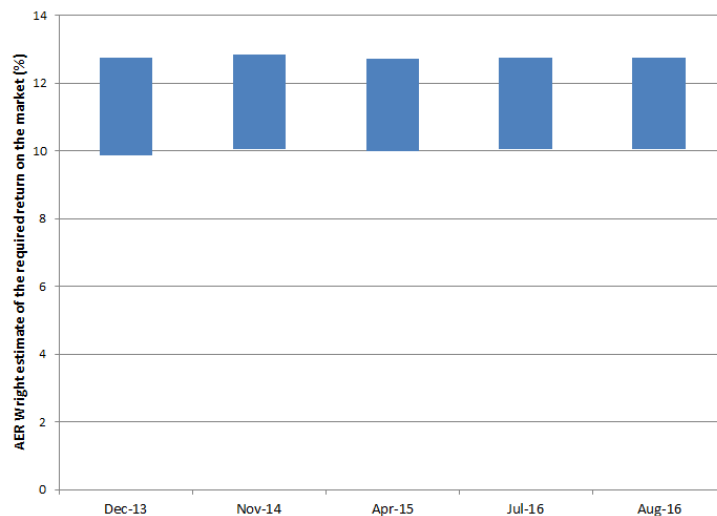
- As shown in Figure 2, the DGM approach estimates that the forward-looking required return on the market has remained stable since the Guideline; and
- Government bond yields have fallen materially since the Guideline; and
- The MRP is estimated by subtracting the government bond yield from the forward-looking estimate of the required return on equity.

- 18 It is difficult to reconcile the fact that the AER has maintained the same MRP allowance even as its DGM estimates have increased materially. It seems that the AER has reduced the relative weight that it applies to its own DGM estimates as they have become more and more inconsistent with its 6.5% allowance.

### **Other evidence considered by the AER**

- 19 The AER also reports that its Wright estimates of the required return on the market have remained stable since the Guideline, as summarised in Figure 3 below.

Figure 3: AER Wright estimates of the required return on the market



Source: AER Rate of Return Guideline; AER Ausgrid Draft Decision; AER Ausgrid Final Decision; AER AusNet Draft Decision; Frontier Economics updated calculations.

20 The other evidence that receives some or limited consideration by the AER is also generally consistent with the notion that the required return on equity has remained quite stable since the Guideline even as government bond yields have fallen, thus implying a higher MRP. For example:<sup>11</sup>

- a. Other regulators are currently adopting higher MRP estimates;
- b. Independent experts are currently adopting higher MRP estimates; and
- c. Conditioning variables are generally consistent with a stable required return on equity and a higher MRP.

### **Views from the market**

21 Evidence from a range of respected market participants is consistent with the weight of evidence set out above – that the required return on equity has remained relatively stable even as government bond yields have fallen. This position is supported by:

- a. Central banks such as the Reserve Bank of Australia and the Federal Reserve Bank of New York;
- b. Other regulators such as Ofgem, FERC, the ERA, and IPART;
- c. Corporate advisory firms such as McKinsey and NERA-US; and
- d. Independent expert firms such as EY, KPMG, Deloitte, and Loneragan Edwards.

<sup>11</sup> See Section 4.5 below.

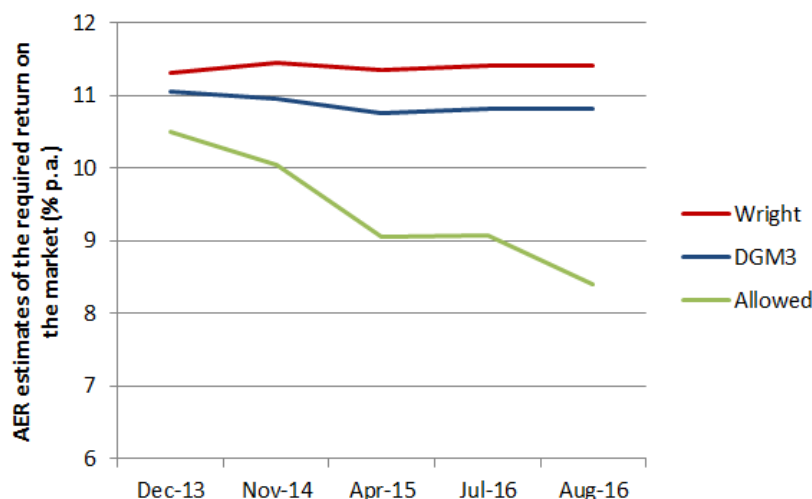
### Implications of the AER's approach

22 Since its 2013 Guideline, the AER has allowed an MRP of 6.5% in every one of its draft and final decisions. The AER's advisors note that this approach results in the allowed return on equity moving one-for-one with changes in risk-free rates:

The AER decisions hold the risk premium nearly constant (although upward adjustments of 0.5% have been made). As (sic) result the regulated return tends to fall 1 for 1 with falls in the risk free rate.<sup>12</sup>

23 The inevitable consequence of setting a nearly constant MRP is that the allowed return on equity falls one-for-one with falls in government bond yields. Since government bond yields have fallen sharply since the Guideline, the AER's allowed return on equity has also fallen correspondingly. This occurs in spite of the evidence set out above – including the AER's own DGM estimates – that the required return on equity has remained remarkably stable since the Guideline. The distinction between the AER's estimates and its regulatory allowance is summarised in Figure 4 below.

Figure 4: The required return on the market – AER estimates and allowances



Source: Rate of Return Guideline, Explanatory Statement, Appendix; Ausgrid Draft Decision Attachment 3; Ausgrid Final Decision Attachment 3; AusNet Draft Decision Attachment 3.

24 Since its Guideline in December 2013, the yield on 10-year government bonds has fallen from 4.1% to 1.9%.<sup>13</sup> The AER has maintained the same 6.5% MRP in every one of its decisions since December 2013. Thus, the AER considers that the required return on equity for the average firm<sup>14</sup> has fallen from 10.6%<sup>15</sup>

<sup>12</sup> Partington and Satchell (2016), p. 17.

<sup>13</sup> <http://www.rba.gov.au/statistics/tables/xls/f02hist.xls>.

<sup>14</sup> Which, under the CAPM, is equal to the sum of the risk-free rate and the MRP.

<sup>15</sup> 4.1% + 6.5%.

in December 2013 to 8.4%<sup>16</sup> now. This represents a decline of more than 25% over the last two and a half years.

25 By contrast, as set out above, there is a substantial body of evidence to support the proposition that the required return on equity has **not** fallen by over 25% in the last two and a half years.<sup>17</sup>

26 The broader effect of the AER's approach to distilling the MRP evidence into a single regulatory allowance is illustrated in Figure 5. That figure contrasts the AER's allowance for the required return on the market with mid-point estimates from the AER's three-stage DGM.<sup>18</sup>

27 The most obvious point of departure is during the global financial crisis (GFC) in late 2008. The AER approach implies that the required return on equity *fell* dramatically during the peak of the GFC – as investors moved funds into government bonds, lowering yields. Such an outcome is obviously implausible – the required return on equity capital does *not* fall materially during financial crises. Of course it is absurd to suggest that equity capital becomes cheaper and more abundant during financial crises. But that is precisely what the AER's approach to setting the MRP suggests. By contrast, the AER's own forward-looking DGM method suggests that the required return on equity increased during the GFC.

Figure 5: The required return on the market – AER mid-point DGM estimates and regulatory allowances



Source: Frontier Economics.

28 Figure 5 also shows that the divergence between the two methods is not confined to the peak of the GFC. For example, throughout 2007 when equity

<sup>16</sup> 1.9% + 6.5%.

<sup>17</sup> See also Section 5 below.

<sup>18</sup> That is, estimates based on the AER's specification and implementation of the DGM with a long-run growth rate of 4.6%.

prices were very high and it is widely accepted that equity capital was relatively cheaper, the AER approach suggests that the cost of equity capital was very high.

29 Importantly, the two approaches currently suggest very different required returns. Whereas the DGM method suggests that the required return on equity has remained quite stable since 2013 (hovering around 11%), the AER allowance suggests a material decline in the cost of equity to the lowest level ever on record.

### **The problem with a constant MRP allowance**

30 The problem with the application of the AER's approach to date is that its decisions imply that the required return on equity **always** falls one-for-one with **every** decline in government bond yields. This fixed relationship between allowed returns and government bond yields leads to implausible estimates in some market conditions, including the current market conditions.

31 In this regard, Partington and Satchell (2016) have recently advised the AER that:

We begin by stating our position that it seems likely that the risk premium changes over time. It is also entirely possible that the risk premium sometimes changes at the same time as interest rates change, but that change may either be in the same direction as the interest rates, or in the opposite direction. At any point in time, there are three possibilities for the market risk premium, it may remain unchanged, it may go down, or it may increase. There is no compelling reason for an interest rate decrease to automatically be associated with an increase in the market risk premium.<sup>19</sup>

32 We agree with everything that Partington and Satchell have said in the above paragraph. However, just as there is “no compelling reason for an interest rate decrease to automatically be associated with an increase in the market risk premium,” there is equally no compelling reason for an interest rate decrease to *never* be associated with an increase in the market risk premium.

33 This is the crux of the problem with the AER's nearly constant MRP. Even though government bond yields have halved since the Guideline, and even though there is strong evidence that the real-world required return from equity holders has not fallen one-for-one with those yields, the AER has maintained the same MRP allowance.

34 We do not suggest that the AER should *always* increase the MRP allowance *whenever* the government bond yield falls or that any increase should completely offset the fall in yields. We simply suggest that the AER should *sometimes* increase the MRP allowance to *partially* offset the fall in yields – when objective evidence supports that course of action.

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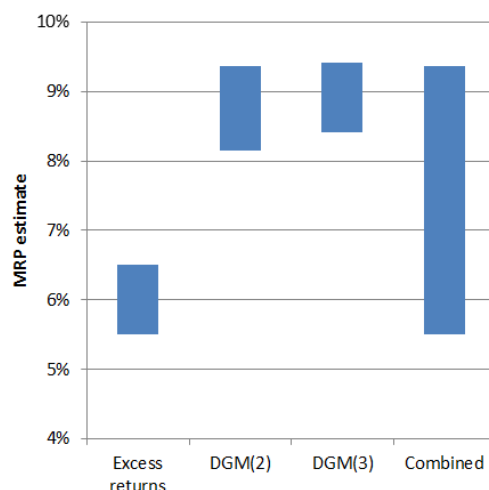
<sup>19</sup> Partington and Satchell (2016), p. 17.

### A current estimate of the MRP

35 Consistent with the AER's Guideline approach, we begin by constructing a combined range from the historical excess returns and DGM ranges. This is set out in Figure 6 below, where:

- a. The historical excess returns range is set to 5.5% to 6.5% with a mid-point estimate of 6.0%, as per Figure 6 below; and
- b. The DGM estimate is set by using the AER's most recent DGM estimates of the required return on the market and subtracting the current 10-year government bond yield of 1.9%. The mid-point three-stage DGM estimate is 9.0%.

Figure 6: Current MRP range – AER Guideline approach



Source: Frontier Economics calculations based on estimates set out in the AusNet Draft Decision, Attachment 3.

36 The second step of the AER's Guideline approach is to select a point estimate from within the combined range. In this regard, we note that the AER's Guideline approach is to select a point estimate where:

This point estimate lies between the historical average range and the range of estimates produced by the DGM. This reflects our consideration of the strengths and limitations of each source of evidence.<sup>20</sup>

37 In its Guideline, the AER adopted a point estimate MRP of 6.5%. The following factors appear to be relevant to the selection of that figure:

- a. The AER's historical excess returns mid-point estimate is 6.0%<sup>21</sup> and its mid-point three-stage DGM estimate is 7.1%.<sup>22</sup> The mid-point of these two estimates is 6.55%;

<sup>20</sup> AER Rate of Return Guideline, Explanatory Statement, p. 97.

<sup>21</sup> AER Rate of Return Guideline, Explanatory Statement, p. 93.

<sup>22</sup> The AER has subsequently stated its preference for the three-stage specification of the DGM. See, for example, JGN Draft Decision, Attachment 3, Appendix C, p. 222.



- b. The AER adopted an upper bound of 6.5% from its historical excess returns approach and a lower bound of 6.7% from its three-stage DGM approach. The mid-point of this gap between the two ranges is 6.6%;
- c. The AER's historical excess returns range and two-stage DGM range overlapped in the region of 6.1% to 6.5%. The mid-point of this region of overlap is 6.3%;
- d. The combined range adopted by the AER was 5.0% (the lower bound of the excess returns range) and 7.5% (the upper bound of the DGM range). The mid-point of the combined range is 6.3%; and
- e. If the historical excess returns range is based on arithmetic means, consistent with the AER's subsequent decisions, the combined range is 5.7%<sup>23</sup> to 7.5%, with a mid-point of 6.6%.

38 In summary, the approach to the MRP that is set out in the AER's Rate of Return Guideline is to rely primarily on the historical excess returns method and the DGM method (particularly the three-stage method) to specify a range for the MRP and to select a point estimate from within that range. Other evidence is considered to be "less informative"<sup>24</sup> and is given only "some"<sup>25</sup> or "limited"<sup>26</sup> consideration.

39 In relation to the current estimates set out above, we note that:

- a. The AER stated that its preferred historical excess returns estimate is 6.0%<sup>27</sup> and its mid-point three-stage DGM estimate was 9.0%.<sup>28</sup> The mid-point of these two estimates is 7.5%;
- b. The upper bound of the AER's historical excess returns approach is 6.5% and the lower bound from the AER's three-stage DGM approach is 8.4%. The mid-point of this gap between the two ranges is 7.5%;
- c. At the time of the Guideline, the AER's historical excess returns range and its two-stage DGM range overlapped. In the current market conditions, the upper bound of the historical excess returns range is 6.5% and the lower bound of the two-stage

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<sup>23</sup> AER Rate of Return Guideline, Explanatory Statement, p. 93.

<sup>24</sup> AER Rate of Return Guideline, Explanatory Statement, p. 96.

<sup>25</sup> AER Rate of Return Guideline, Explanatory Statement, p. 97.

<sup>26</sup> AER Rate of Return Guideline, Explanatory Statement, p. 97.

<sup>27</sup> AER Rate of Return Guideline, Explanatory Statement, p. 97.

<sup>28</sup> The AER has subsequently stated its preference for the three-stage specification of the DGM. See, for example, JGN Draft Decision, Attachment 3, Appendix C, p. 222.

DGM range is 8.2%. The mid-point of the gap between these two ranges is 7.4%; and

- d. The combined range is from 5.5% (the lower bound of the excess returns range) and 9.4% (the upper bound of the DGM range<sup>29</sup>). The mid-point of the combined range is 7.5%.

40 In summary, we have identified the sorts of considerations that the AER applied when selecting its Guideline MRP of 6.5%. If we apply those same sorts of considerations to the current evidence that the AER has compiled, the result is an estimate of 7.5%.

41 If the MRP is set to 7.5%, the implied market return is 9.4%<sup>30</sup> which is still materially below the 10.5%<sup>31</sup> allowed market return at the time of the Guideline. That is, setting the current MRP to 7.5% implies that the required return on equity has reduced materially since the Guideline, but less than one-for-one with the fall in the risk-free rate.

42 An allowed MRP of 7.5% is an outcome that lies between:

- a. The view that the MRP is constant over all market conditions such that the required return on equity rises and falls one-for-one with changes in the risk-free rate; and
- b. The view that the required return on equity has remained stable over the period since the Guideline.

43 In our view, this is a very conservative estimate in light of the weight of evidence set out above – which supports the notion that the required return on equity has not declined materially since the Guideline.

44 Since the Guideline:

- a. The AER's own DGM estimates indicate that the MRP has increased materially;
- b. The AER's own DGM estimates indicate that the overall required return on equity has remained stable; and
- c. There is substantial other evidence, as set out in Section 5 below, that the overall required return on equity has remained stable.

45 In persisting with a 6.5% MRP (such that its allowed return on equity has been reduced by more than 25% since the Guideline) the AER is apparently applying no weight to any of this evidence. In particular, as the AER's own DGM estimates of the required return on equity have remained stable, it has apparently afforded that evidence progressively less weight – reducing the allowed return by more than 25%.

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<sup>29</sup> Note that the upper bound is currently the same for the AER's two-stage and three-stage DGM approaches.

<sup>30</sup> 1.9% + 7.5%.

<sup>31</sup> 4.0% + 6.5% = 10.5%.

- 46 The AER's DGM results and other evidence it relies on to estimate the MRP have steadily risen since the Guideline, and these results appear to have been given progressively less weight in regulatory decisions. In our view, this approach is unreasonable – the allowed return on equity should respond to market conditions and should not be set by adding a fixed premium to the contemporaneous government bond yield.
- 47 We have also been asked to consider whether the 7.5% estimate is supported by all of the current evidence that we consider to be relevant. In doing this, our approach is to incorporate all of the evidence that we consider to be relevant to informing the estimate of the MRP, including reducing the theta estimate to 0.35. We conclude that the current evidence, including a theta of 0.35, supports an MRP estimate of at least 7.5%.

## 2 The regulatory task

48 Within the CAPM, the MRP is a parameter that reflects the additional return, over and above the risk-free return, that investors would require from an investment of average risk.

49 It is well accepted that the MRP varies over time as market conditions change. For example, as market conditions change, investors might reassess the amount of risk that is involved in a particular investment or the return that they require for bearing risk. This is consistent with the fact that regulatory estimates of the debt risk premium have varied materially over the last 10 years – if the return premium for bearing a certain amount of risk varies materially for debt securities, it follows that it must also vary for equity securities.

50 In this regard, the Australian Energy Regulator (AER) stated in its Rate of Return Guideline materials that:

Evidence suggests the MRP may vary over time. In their advice to the AER, Professor Lally and Professor Mackenzie and Associate Professor Partington have expressed the view that the MRP likely varies over time.<sup>32</sup>

51 In its most recent decisions, the AER states that it seeks to estimate:

...the prevailing market risk premium<sup>33</sup>

which is:

...a forward-looking estimate of the risk premium.<sup>34</sup>

52 The AER also notes that:

The Sharpe-Lintner CAPM is a forward-looking equilibrium asset pricing model and therefore requires forward looking input parameters.<sup>35</sup>

53 This is consistent with the view set out in the Guideline materials, where the AER stated that its task is to:

...determine an estimate of the 10 year forward looking risk free rate and 10 year forward looking MRP.<sup>36</sup>

54 In summary, the AER has recognised that the MRP varies over time and that the regulatory task is to adopt a forward-looking estimate of the MRP that is commensurate with the prevailing conditions in the market for equity funds. We agree with this characterisation of the regulatory task.

55 The AER also notes that the market risk premium is the amount by which the required return on the market portfolio exceeds the risk-free rate.<sup>37</sup> That is, the

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<sup>32</sup> AER (2013), Rate of Return Guideline: Explanatory Statement, p. 91.

<sup>33</sup> AusNet Draft Decision, Attachment 3, p. 57.

<sup>34</sup> AusNet Draft Decision, Attachment 3, p. 57.

<sup>35</sup> AusNet Draft Decision, Attachment 3, p. 188.

<sup>36</sup> AER (2013), Rate of Return Guideline: Explanatory Statement, Appendices, p. 108.

<sup>37</sup> AusNet Draft Decision, Attachment 3, p. 45.

required return on the market portfolio (which is the same as the required return on equity for a stock of average risk) is computed by adding the MRP estimate to the current risk-free rate:

$$r_m = r_f + MRP.$$

56 The resulting estimate of the required return on the market is then used in the SL-CAPM formula:

$$r_e = r_f + \beta(r_m - r_f).$$

57 That is, the regulatory task is to estimate, for an asset of average risk, the forward-looking required return on equity that is commensurate with the prevailing conditions in the market for equity funds.

58 Consequently, in the remainder of this report we consider the question of how to best estimate the forward-looking required return on equity that is commensurate with the prevailing conditions in the market for equity funds. This is equivalent to considering how to best estimate the forward-looking MRP that is commensurate with the prevailing conditions in the market for equity funds. These are equivalent considerations because the two quantities differ only by the risk-free rate, and there is no controversy about that being set to the contemporaneous yield on 10-year government bonds.

## 3 The AER's Guideline approach to estimating the MRP

### 3.1 Methods considered by the AER

59 In its Rate of Return Guideline, and in subsequent decisions, the AER has regard to a number of methods for estimating the MRP. In this section, we begin with an overview of those methods and then consider the process by which the AER distils that evidence into an estimate of the forward-looking MRP that is consistent with the prevailing conditions in the market for equity funds.

#### *Historical excess returns*

60 Prior to the 2013 Guideline, the AER set the allowed MRP on the basis of the mean of historical excess returns. This approach involves estimating the excess market return for each year of a long historical period by taking the return on a broad stock market index over the year and subtracting the return that could have been earned on government bonds over that year. The mean excess return over the historical period is then used as an estimate of the average MRP over that period.

61 The mean historical excess return ranges between approximately 6.0% and 6.5% depending on which historical period is considered. Prior to the Guideline, the AER had set the MRP to either 6.0% or 6.5% in all of its decisions.

#### *Dividend growth model (DGM)*

62 The DGM involves forecasting future dividends on the market portfolio and then solving for the discount rate that equates the present value of those dividends with current stock prices. This approach provides a direct estimate of the required return on the market portfolio. Subtracting the current risk-free rate then produces an estimate of the MRP.

63 In its Guideline materials, the AER stated that the main change to its approach to estimating the MRP was that it intended to apply more weight to DGM estimates of the MRP. In endorsing the use of DGM estimates, the AER stated that:

- a. DGM estimates “may reflect current market conditions more closely”;<sup>38</sup>
- b. “DGMs are recognised financial models that are commonly used in practice;”<sup>39</sup> and

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<sup>38</sup> AER Rate of Return Guideline, Explanatory Statement, p. 96.

<sup>39</sup> AER Rate of Return Guideline, Explanatory Statement, p. 96.

- c. “DGMs are suited to the estimation of the rate of return from current market information, as demonstrated by US regulators using them for this purpose.”<sup>40</sup>

64 In its Guideline, the AER set out its preferred DGM specification, concluding that:

...we have greater confidence in the symmetry of this information through time and give these estimates greater consideration than we have in the past.<sup>41</sup>

### **Historical real returns (Wright)**

65 Another approach for estimating the MRP is what has become known as the “Wright” approach in the Australian regulatory setting. This involves taking the average real return on a broad stock market index over a long historical period and increasing it for expected inflation to obtain an estimate of the required return on the market. Subtracting the current risk-free rate then produces an estimate of the MRP.

66 The AER computes and publishes Wright approach estimates of the MRP, but does not use these estimates to inform its MRP allowance. That is, the AER does not compare its MRP allowance with the Wright estimate of the MRP. Rather, the AER compares:

- a. Its MRP allowance multiplied by its beta estimate of 0.7; with
- b. Its Wright estimate of the MRP multiplied by a beta of 0.4,

and concludes that if the latter is smaller than the former, the Wright evidence will have no impact on its allowed return on equity.<sup>42</sup>

67 This has the effect of ensuring that the Wright evidence will never have any impact on the allowed return on equity.

### **Other evidence**

68 The AER indicates that it has some limited regard to surveys, although the AER states that it:

...consider[s] this evidence less informative than historical averages and DGM estimates.<sup>43</sup>

69 The AER also states that independent expert valuation reports “should play a role in our estimation of the expected return on equity,”<sup>44</sup> cautioning that they must be contemporaneous:

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<sup>40</sup> AER Rate of Return Guideline, Explanatory Statement, p. 96.

<sup>41</sup> AER Rate of Return Guideline, Explanatory Statement, p. 96.

<sup>42</sup> AusNet Draft Decision, pp. 192-193.

<sup>43</sup> AER Rate of Return Guideline, Explanatory Statement, p. 96.

<sup>44</sup> AER Rate of Return Guideline, Explanatory Statement, Appendices, p. 28.

Expert reports are credible, verifiable, and clearly sourced. Against this, expert reports are not released at regular intervals. Consequently, some estimates may be out of date.<sup>45</sup>

70 The AER also states that it gives “limited consideration”<sup>46</sup> to conditioning variables and other regulators’ estimates:

We also give some consideration to conditioning variables and other regulators’ MRP estimates. These sources of evidence are subject to various limitations and should be used with caution.<sup>47</sup>

### 3.2 Distilling the evidence into a single MRP allowance

71 In its Guideline materials, the AER stated that, when setting the allowed MRP, it relies primarily on its historical excess returns and DGM estimates:

...we give greatest consideration to historical averages followed by estimates of the MRP from DGMs and then surveys. We also give some consideration to conditioning variables and other regulators’ estimates of the MRP.<sup>48</sup>

72 The AER further states that it gives:

...significant consideration to DGM estimates of the MRP,<sup>49</sup>

and described its development of a preferred approach for implementing the DGM as:

...the most significant development in this area.<sup>50</sup>

73 The AER also notes that it gives “some”<sup>51</sup> consideration to surveys and “limited”<sup>52</sup> consideration to other evidence. In this regard, the AER states that:

We also give consideration to survey estimates of the MRP but consider this evidence less informative than historical averages and DGM estimates,<sup>53</sup>

and:

We also give some consideration to conditioning variables and other regulators’ MRP estimates. These sources of evidence are subject to various limitations and should be used with caution.<sup>54</sup>

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<sup>45</sup> AER Rate of Return Guideline, Explanatory Statement, Appendices, p. 28.

<sup>46</sup> AER Rate of Return Guideline, Explanatory Statement, p. 97.

<sup>47</sup> AER Rate of Return Guideline, Explanatory Statement, p. 97.

<sup>48</sup> AER Rate of Return Guideline, Explanatory Statement, p. 95.

<sup>49</sup> AER Rate of Return Guideline, Explanatory Statement, p. 97.

<sup>50</sup> AER Rate of Return Guideline, Explanatory Statement, Appendices, p. 89.

<sup>51</sup> AER Rate of Return Guideline, Explanatory Statement, p. 97.

<sup>52</sup> AER Rate of Return Guideline, Explanatory Statement, p. 97.

<sup>53</sup> AER Rate of Return Guideline, Explanatory Statement, p. 96.

<sup>54</sup> AER Rate of Return Guideline, Explanatory Statement, p. 97.



74 Thus, when setting the allowed MRP, the AER relies primarily on its historical excess returns and DGM estimates.

75 The AER begins by setting a range for the MRP:

The AER proposes to estimate a range for the MRP, and then select a point estimate from within that range.<sup>55</sup>

76 The AER's MRP range is the aggregation of ranges from the historical excess returns and DGM methods. In its Guideline materials, the AER concludes that:

- a. The historical excess returns method supports a range of 5.0% to 6.5%;<sup>56</sup> and
- b. The DGM method supports a range of 6.1% to 7.5%.<sup>57</sup>

77 The AER then combines these two ranges into a single combined range of 5.0% to 7.5%.<sup>58</sup>

78 We summarise the AER's Guideline approach to setting the MRP in Figure 7 below. The AER computes DGM estimates using a two-stage specification and a three-stage specification, but has concluded that:

...a three stage DGM is conceptually better than a two stage DGM<sup>59</sup>

and that:

We use a three stage model because we consider the three stage model more plausible. This is because we expect it to take some time for the short term growth in dividends to transition to the long term growth.

In addition to the three stage model, we also consider a two stage model...given the way the short term growth rate is calculated, the two stage model should be used as a cross check.<sup>60</sup>

79 Consequently, we show the full range of the AER's DGM estimates as well as the range from the three-stage specification.

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<sup>55</sup> AER Rate of Return Guideline, p. 16.

<sup>56</sup> AER Rate of Return Guideline, Explanatory Statement, p. 95.

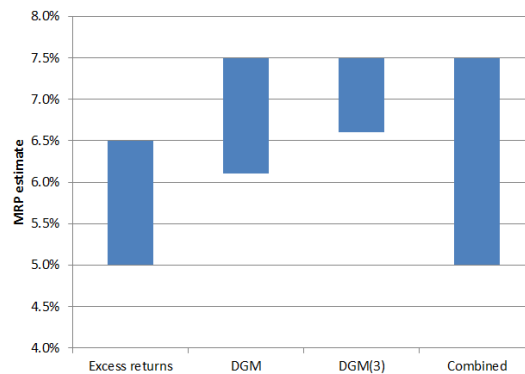
<sup>57</sup> AER Rate of Return Guideline, Explanatory Statement, p. 97.

<sup>58</sup> AER Rate of Return Guideline, Explanatory Statement, p. 97.

<sup>59</sup> JGN Draft Decision, Attachment 3, Appendix C, p. 222.

<sup>60</sup> JGN Draft Decision, Attachment 3, Appendix C, p. 222.

Figure 7: AER Guideline MRP ranges



Source: AER Rate of Return Guideline, December 2013.

80 In its Guideline materials, the AER set the allowed MRP to 6.5%. In selecting this figure, the AER noted that there was some overlap between the historical excess returns and DGM ranges at 6.5%:

We consider an MRP estimate of 6.5 per cent provides an appropriate balance between the various sources of evidence. This point estimate lies between the historical average range and the range of estimates produced by the DGM. This reflects our consideration of the strengths and limitations of each source of evidence.<sup>61</sup>

81 Moreover, the AER stated that its preferred historical excess returns estimate is 6.0%<sup>62</sup> and has since stated that its preferred approach to the DGM is the three-stage specification,<sup>63</sup> which has a mid-point estimate of 7.1%. The final MRP allowance of 6.5% is approximately the mid-point between these two point estimates.

82 In summary, the approach to the MRP that is set out in the AER's Rate of Return Guideline is to rely primarily on the historical excess returns method and the DGM method (particularly the three-stage method) to specify a range for the MRP and to select a point estimate from within that range. Other evidence is considered to be "less informative"<sup>64</sup> and is given "some"<sup>65</sup> or "limited"<sup>66</sup> consideration.

### 3.3 A forward-looking estimate that is commensurate with the prevailing conditions

83 As set out in Section 2 above, there is broad agreement that the regulatory task is to estimate a forward-looking MRP that is commensurate with the prevailing

<sup>61</sup> AER Rate of Return Guideline, Explanatory Statement, p. 97.

<sup>62</sup> AER Rate of Return Guideline, Explanatory Statement, p. 97.

<sup>63</sup> JGN Draft Decision, Attachment 3, Appendix C, p. 222.

<sup>64</sup> AER Rate of Return Guideline, Explanatory Statement, p. 96.

<sup>65</sup> AER Rate of Return Guideline, Explanatory Statement, p. 97.

<sup>66</sup> AER Rate of Return Guideline, Explanatory Statement, p. 97.

conditions in the market for equity funds. In this section, we consider how the historical excess returns and DGM methods are able to contribute to this regulatory task.

84 We begin by noting that there is broad agreement that the DGM method does produce a forward-looking MRP that is commensurate with the prevailing conditions in the market for equity funds. In this regard, the AER states that:

The DGM method is a theoretically sound estimation method for the MRP. As DGM estimates incorporate prevailing market prices, they are more likely to reflect prevailing market conditions. DGM estimates are also clearly forward looking as they estimate expectations of future cash flows and equate them with current market prices through the discount rate.<sup>67</sup>

and:

...we consider DGM estimates have strong theoretical grounding and are more likely to reflect prevailing market conditions than other approaches.<sup>68</sup>

85 The historical excess returns approach estimates the MRP by taking the mean excess return over a long historical period. Self-evidently, this estimate must reflect the average market conditions over the historical period that was used. Logically, this approach can only produce a forward-looking estimate that is commensurate with the prevailing conditions in the market in two circumstances:

- a. Investors always require the same MRP in all market conditions; or
- b. The current market conditions are the same as the average market conditions over the historical period.

86 In relation to the conjecture that investors always require the same MRP in all market conditions, the AER notes that:

Although the [historical excess returns] estimate changes slowly over time, we consider it is likely to reflect prevailing market conditions if investor expectations are guided by historical excess returns.<sup>69</sup>

87 However, the prospect that investors always require the same risk premium in all market conditions is inconsistent with the generally accepted view that risk premiums are higher during recessions and financial crises and lower during economic expansions. It is also inconsistent with the AER's own view that the MRP likely varies over time<sup>70</sup> and with the following advice from the AER's consultant:

...the AER believes that the historic average of excess returns may be used by investors to estimate the future MRP and therefore would be a forward-looking

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<sup>67</sup> AER (2013), Rate of Return Guideline: Explanatory Statement, Appendices, p. 84.

<sup>68</sup> AER (2013), Rate of Return Guideline: Explanatory Statement, Appendices, p. 85.

<sup>69</sup> AER (2013), Rate of Return Guideline: Explanatory Statement, Appendices, p. 78.

<sup>70</sup> AER (2013), Rate of Return Guideline: Explanatory Statement, p. 91.

methodology if investors acted in this way. Whether investors act in this way is debatable.<sup>71</sup>

88 The alternative motivation for the use of mean historical excess returns is that the current market conditions are the same as the average market conditions over the historical period. However, the prevailing market conditions are very different from the average historical conditions in that the yield on government bonds is lower than at any time in history. The current yield on 10-year government bonds is 1.8% whereas the average yields over the various historical periods that the AER considers are several times greater than this, as set out in Table 1 below.

Table 1: Mean historical excess return estimates

Historical period	Mean excess return	Mean government bond yield
1883-2015	6.3%	5.6%
1937-2015	6.0%	6.5%
1958-2015	6.5%	7.6%
1980-2015	6.2%	8.4%
1988-2015	5.6%	6.9%

Source: Frontier calculations.

89 Of course, there are many dimensions to “market conditions” and many variables can be used to provide an indication of whether the prevailing conditions differ from the historical average market conditions. We consider that the 10-year government bond yield is the most directly relevant and important indicator because it is the figure that is added to the MRP estimate to produce the allowed return on equity.

90 Thus, the approach of adding the (effectively constant) mean historical excess return estimate to the prevailing government bond yield currently produces an historically low allowed return on equity – due to the historically low government bond yield. This would only be appropriate if the cost of equity capital really was at historical lows. The evidence that we report in Sections 4 and 0 below, as well as the AER’s own DGM evidence, is inconsistent with the notion that the cost of equity capital is currently at historical lows. Rather, the evidence suggests that the cost of equity capital has been quite stable over recent years, even as government bond yields have fallen materially.

91 Because:

- a. Investors do *not* always require the same MRP in all market conditions; and

<sup>71</sup> Lally, M., 2013, Review of the AER’s Methodology, March, p. 6.

- b. The current market conditions are *not* the same as the average market conditions over the historical period,

there is no reason to conclude that the historical excess returns approach would, in the current circumstances, produce a forward-looking MRP that is commensurate with the prevailing conditions in the market for equity funds.

- 92 Indeed, the AER itself distinguishes between its historical MRP estimates on the one hand and its forward-looking DGM estimates on the other:

Rather, we used results from both forward looking methods and historical averaging of excess returns for estimating the MRP and the results from forward looking methods unambiguously constitute estimates of the prevailing rather than the long-term average value for the MRP.<sup>72</sup>

- 93 The AER goes on to conclude that the only reason that there is any need to rely on mean historical excess return estimates is due to concerns about relying exclusively on the forward-looking DGM estimate:

If a perfectly reliable estimate of the MRP could be generated from market prices it would be reasonable to use this estimate. However, no such estimate exists.<sup>73</sup>

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<sup>72</sup> AER (2013), Rate of Return Guideline, Explanatory Statement, Appendices, p. 103.

<sup>73</sup> AER (2013), Rate of Return Guideline, Explanatory Statement, Appendices, p. 110.

## 4 The evolution of the evidence on which the AER relies

### 4.1 The evolution of the AER's range of estimates

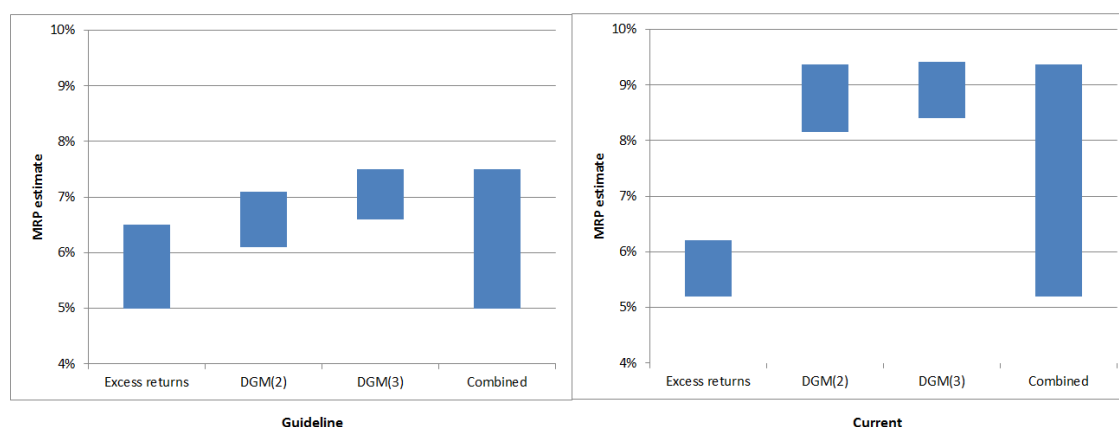
94 In this section, we show that the evidence on which the AER relies has changed materially since the publication of the Guideline in 2013. However, the AER has maintained the same MRP allowance of 6.5% in every decision since the Guideline.

95 As set out in Section 3 above, the AER's Guideline approach to the MRP is to form a range based on the combined range of its historical excess returns and DGM estimates. The resulting ranges from the evidence at the time of the Guideline and the current evidence are set out in Figure 8 below.

96 Clearly, the evidence has changed materially since the time of the Guideline. The estimates from the AER's forward-looking DGM specifications have increased substantially, so the top end of the combined range is now materially higher than at the time of the Guideline.

97 Whereas the Guideline and subsequent AER decisions specified a range of 5.0% to 6.5% for the historical excess returns estimates, the AER's recent decisions no longer specify a range. Rather, the AER states that its "range for historical returns is based on arithmetic averages." The arithmetic averages that the AER reports in its recent decisions range between 5.2% and 6.2%, depending on which historical period is considered.<sup>74</sup> This is the range that we have displayed in Figure 8 below.

Figure 8: AER MRP ranges

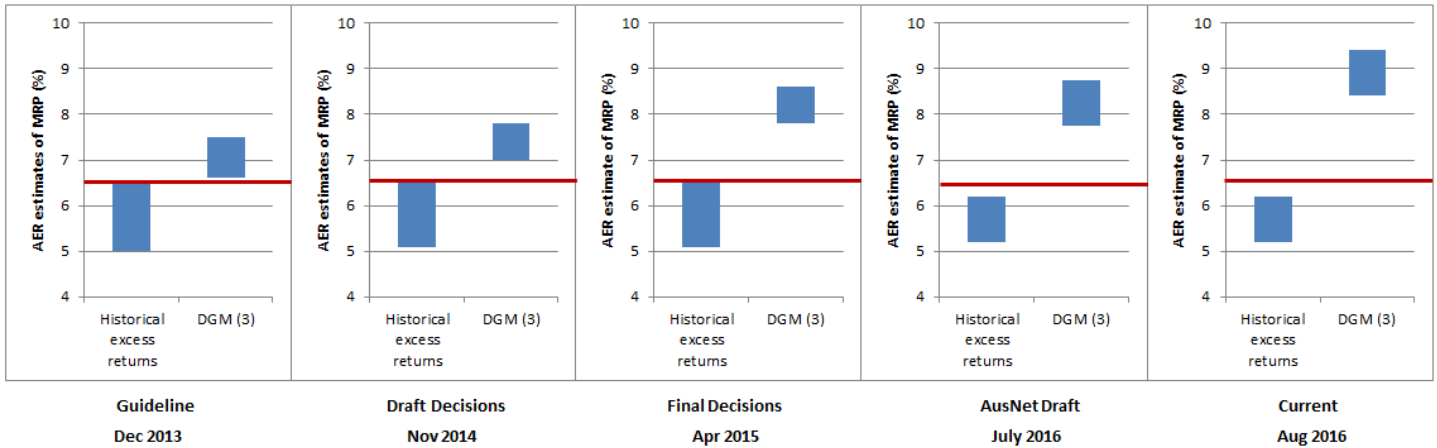


Source: AER Rate of Return Guideline, December 2013; AusNet Draft Decision; Current estimate using risk-free rate of 1.9%.

<sup>74</sup> AusNet Draft Decision, Attachment 3, Table 3-22, p. 191 to 192. However, these estimates are lower than our own updates and those of the ERA, possibly due to the AER's use of a price index instead of an accumulation index when updating estimates over the last two years.

98 We summarise the evolution of the AER's primary MRP estimates and the AER's MRP allowance in Figure 9 below.

Figure 9: The AER's primary MRP estimates



Source: Rate of Return Guideline; Ausgrid Draft Decision; Ausgrid Final Decision; AusNet Draft Decision; Current estimate using risk-free rate of 1.9%.

99 Figure 9 shows that:

- The AER's historical excess returns estimate has not changed materially since the Guideline;<sup>75</sup>
- The AER's DGM estimates of the MRP have increased materially since the Guideline and are currently higher than at any time since the Guideline; and
- The AER's allowed MRP (the red line in the figure) has remained constant since the Guideline.

100 That is, Figure 9 shows that the AER's DGM estimates appear to have little or no impact on the AER's MRP allowance – the AER's DGM estimates have increased materially, but this has had no impact on the AER's MRP allowance.

101 We note that, in its recent final decisions, the AER has stated that it has not departed from its Guideline approach to the MRP<sup>76</sup> and that:

We have not changed the weight we apply to the dividend growth model.<sup>77</sup>

102 That is, the AER's approach to processing the relevant evidence and the weight that it applies to the DGM evidence has not changed since the Guideline. This can only be reconciled with the evidence in Figure 9 above if the DGM evidence plays only a minor role in determining the allowed MRP, with the vast majority

<sup>75</sup> We consider this source of evidence in more detail in Section 4.2 below.

<sup>76</sup> AusNet Draft Decision, Attachment 3, p. 61.

<sup>77</sup> AusNet Draft Decision, Attachment 3, p. 207.

of weight being applied to historical excess returns.<sup>78</sup> Although the AER's own DGM estimates have diverged materially since the Guideline, its MRP allowance remains anchored to the historical excess returns estimate.

103 In summary, the AER's MRP allowance appears to be based almost exclusively on the historical excess returns estimate – which, by its nature, is guaranteed to remain very stable over time and is independent of the prevailing market conditions. If material weight is assigned only to methods that produce essentially constant estimates over time, it is impossible for there to be any result other than a constant allowed MRP.

104 This contrasts with the regulatory task of estimating a forward-looking MRP that is commensurate with the prevailing conditions in the market for equity funds. The AER's DGM estimates suggest that the forward-looking MRP that is commensurate with the prevailing conditions has increased materially since the Guideline, but the AER's MRP allowance has remained fixed.

105 In the remainder of this section, we summarise the evolution of the MRP estimates from each of the methods that the AER set out in its Guideline. In general, we report that:

- a. The long-run mean of historical excess returns has remained stable due to its nature as a long-run mean; and
- b. The other evidence suggests that since the Guideline, the overall required return on equity has remained quite stable even as government bond yields have fallen – implying that the MRP has increased.

## 4.2 The AER's historical excess returns estimates

106 In its Rate of Return Guideline, the AER set out estimates of the arithmetic and geometric mean of excess returns over various historical periods.<sup>79</sup> The AER concluded that the mean historical excess returns supported an MRP range of 5.0% to 6.5%.

107 The top of that range was set slightly above the highest arithmetic mean estimate, presumably in recognition of the fact that no mean estimate is perfectly precise, but has a statistical confidence interval around it.<sup>80</sup>

108 The bottom of that range was set to 20 basis points above the highest geometric mean estimate due to concerns about the geometric estimate:

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<sup>78</sup> We have previously submitted that the AER appears to use the DGM for no purpose other than selecting a point estimate at the top of its primary range based on historical excess returns. However, the AER has stated that it does not use its DGM evidence in this way. See, for example, Ausgrid Final Decision, Attachment 3, pp. 368-369.

<sup>79</sup> AER Rate of Return Guideline, Explanatory Statement, Appendices, Table D.2, p. 83.

<sup>80</sup> This is not to say that the 6.5% figure is based formally on any confidence interval. Given the high volatility in annual excess returns, the standard error of the mean estimates is large and statistical confidence intervals are very wide.



...there are concerns with using the geometric mean as a forward looking estimate. Therefore, we consider a reasonable estimate of the lower bound will be above the geometric average. However, we give some weight to geometric mean estimates. Therefore, we consider a lower bound estimate of 5.0 per cent appropriate.<sup>81</sup>

109 In its November 2014 draft decisions and its April 2015 final decisions, the AER followed the Guideline in setting the top of the range to 6.5% and the bottom of the range to 20 basis points above the highest geometric mean:

Consistent with the approach in the Guideline, we set the bottom of the range as 20 basis points above the highest estimate from the range of geometric averages.<sup>82</sup>

110 In its May 2016 final decisions, the AER appeared to change its approach to reporting the evidence from historical excess returns:

Historical excess returns provide our baseline estimate and indicates a market risk premium of approximately 5.5 to 6.0 per cent from a range of 4.8 per cent to 6.0 per cent. We consider both geometric and arithmetic averages of historical returns. However, we consider there may be evidence of bias in the geometric averages. Therefore, our range for historical returns is based on arithmetic averages.<sup>83</sup>

111 The AER has adopted the same approach in its July 2016 draft decisions.<sup>84</sup>

112 Having concluded that there may be evidence of bias in the geometric averages, the AER states that its “range for historical returns is based on arithmetic averages.”<sup>85</sup> The arithmetic averages that the AER reports range between 5.2% and 6.2%, depending on which historical period is considered.<sup>86</sup> This is the range that we have displayed in Figure 9 above.

113 In its recent final decisions, the AER reports three different ranges for historical excess returns:

- a. 5.5% to 6.0%;<sup>87</sup>
- b. 4.8% to 6.0%;<sup>88</sup> and
- c. 4.8% to 6.2%.<sup>89</sup>

114 The 4.8% figure is a geometric mean estimate and is therefore irrelevant to a range that “is based on arithmetic averages.” In our view, a range of 5.5% to

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<sup>81</sup> AER Rate of Return Guideline, Explanatory Statement, p. 93.

<sup>82</sup> Ausgrid Draft Decision, Attachment 3, p. 193; Ausgrid Final Decision, Attachment 3, p. 115.

<sup>83</sup> AusNet Draft Decision, Attachment 3, p. 59.

<sup>84</sup> AusNet Draft Decision, Attachment 3, p. 59.

<sup>85</sup> AusNet Draft Decision, Attachment 3, p. 59.

<sup>86</sup> AusNet Draft Decision, Attachment 3, Table 3-22, p. 191 to 192.

<sup>87</sup> AusNet Draft Decision, Attachment 3, p. 59.

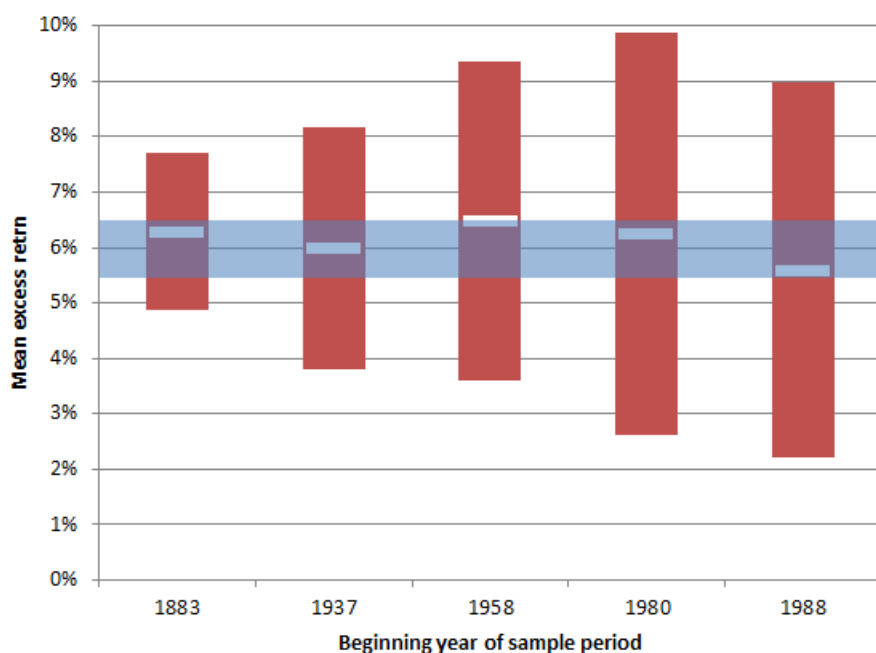
<sup>88</sup> AusNet Draft Decision, Attachment 3, p. 59.

<sup>89</sup> AusNet Draft Decision, Attachment 3, Figure 3-3, p. 58.

6.0% is not an accurate characterisation of the AER's arithmetic mean estimates. Two of the five arithmetic mean estimates reported by the AER are above 6.0% and four of the five are above 5.7%. The lowest estimate is for the shortest period, so is the least precise and the most volatile estimate. For example, the AER's estimate of the historical excess return from 1988 has varied between 5.2% and 5.9% since the Guideline. Moreover, the standard error of a mean estimate is proportional to the square root of the number of observations – so the standard error is relatively large and the confidence interval is relatively wide if the number of observations is small. In this regard, our estimate of the standard 95% confidence interval for the estimate from this short period is from -1.2% to 12.3%. That is, the period is so small that the estimate from it is statistically uninformative.

115 Moreover, we have been unable to replicate the AER's historical excess returns estimates. Our estimates are slightly higher than the AER's estimates and are consistent with the estimates recently computed by the ERA for the corresponding time periods.<sup>90 91</sup> In our view, a more accurate characterisation of the arithmetic mean point estimates is a range of 5.5% to 6.5%. We summarise our point estimates and a one standard error band and our proposed range in Figure 10 below.

Figure 10: Proposed range of historical excess returns estimates



Source: Frontier Economics calculations.

<sup>90</sup> The ERA ultimately reports an MRP relative to the five-year risk-free rate and gives equal weight to the BHM and NERA historical stock return series. One step of its process is to compute the MRP relative to the 10-year risk-free rate using the BHM data. It is those numbers that we have compared with our own to ensure a like with like comparison.

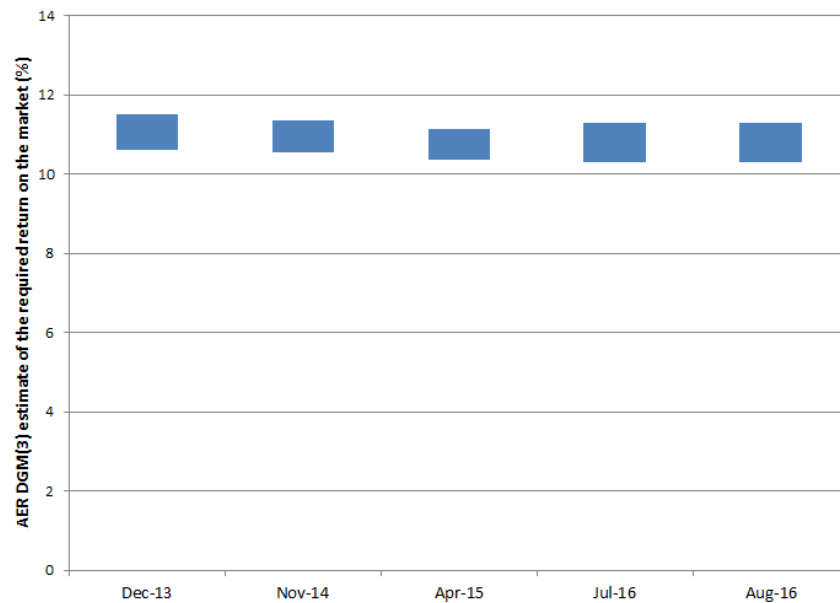
<sup>91</sup> The difference is possibly due to the AER's updates being based on a price index rather than an appropriate accumulation index.

### 4.3 The AER's DGM estimates

116 The evolution of the AER's DGM estimates of the MRP is summarised in Figure 9 above. It is clear that these estimates have increased materially since the Guideline.

117 The reason for the increase in these estimates of the MRP is that the overall required return on equity has remained stable while the government bond yield has fallen materially. Figure 11 below shows that the AER's own DGM estimates of the required return on equity have not changed between the Guideline in December 2013 and the AER's recent May 2016 decisions, and remain the same when applied to current data. Since an ever decreasing government bond yield is being subtracted from a stable estimate of the required return on equity, the result is an increasing estimate of the MRP.

Figure 11: AER three-stage DGM estimates of the required return on the market

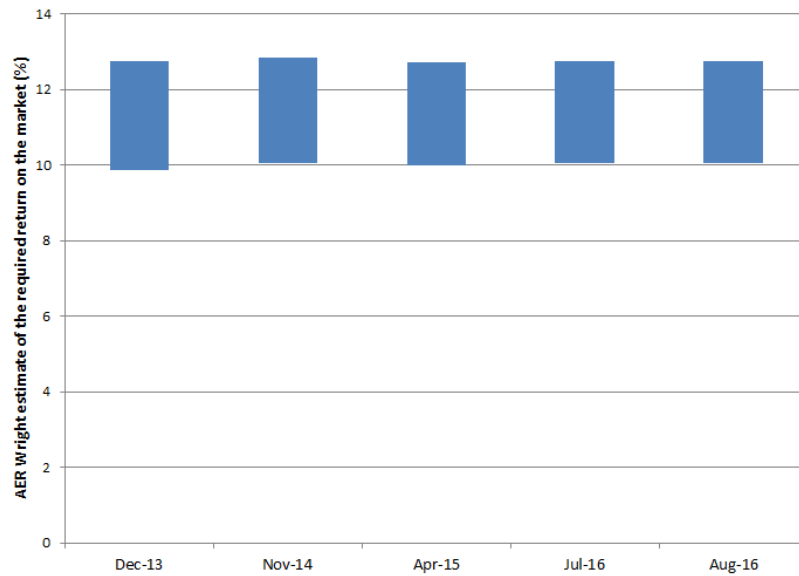


Source: AER Rate of Return Guideline; AER Ausgrid Draft Decision; AER Ausgrid Final Decision; AER AusNet Draft Decision; Frontier Economics updated calculations.

### 4.4 The AER's Wright estimates

118 The AER reports that its Wright estimates of the required return on the market have remained stable since the Guideline, as summarised in Figure 12 below.

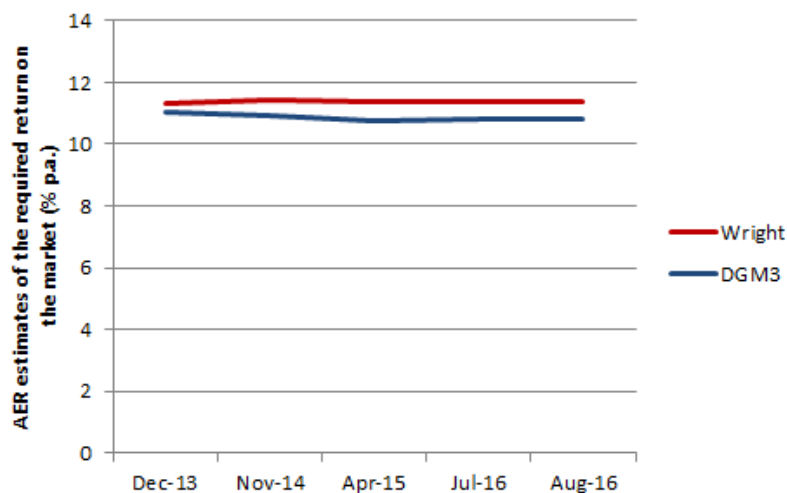
Figure 12: AER Wright estimates of the required return on the market



Source: AER Rate of Return Guideline; AER Ausgrid Draft Decision; AER Ausgrid Final Decision; AER AusNet Draft Decision; Frontier Economics updated calculations.

119 This is consistent with the AER's DGM estimates above. Since the Guideline, the AER's mid-point estimates of the required return on the market have remained remarkably constant, as summarised in Figure 13 below.

Figure 13: The AER's DGM and Wright estimates of the required return on the market



Source: Rate of Return Guideline, Explanatory Statement, Appendix; Ausgrid Draft Decision Attachment 3; Ausgrid Final Decision Attachment 3; AusNet Draft Decision Attachment 3.

## 4.5 Other considerations

120 Whereas the AER has regard to a number of other considerations when setting its MRP allowance, none of these have led the AER to make any adjustment to its preliminary estimate that is based primarily on historical excess returns. The fact that the other considerations do not have any material influence serves to reinforce the stability in the MRP allowance. In this section, we analyse updated data in relation to items that the AER has considered in its recent decisions.

## Regulatory determinations

121 When determining its MRP allowance, the AER has some regard to MRP allowances from other regulators.<sup>92</sup> Table 2 below sets out recent allowances from a number of regulators.

Table 2: Other regulator's MRP allowances

Regulator	Determination	Date	MRP allowance	Details
ERA	ATCO Gas Final Decision	06/2015	7.6%	5.5 to 8.9% historical returns (excess returns and Wright approach). 5.6% to 9.7% DGM.
	DBP Final Decision	06/2016	7.4%	5.4 to 8.5% historical returns (excess returns and Wright approach). 7.6% to 8.8% DGM.
IPART	Semi-annual WACC Update	02/2016	7.3%	6.0% historical average. 8.5% prevailing conditions. IPART adds its MRP estimate to a risk-free rate that is 90 basis points above the prevailing government bond yield.
ESC	Goulburn-Murray Water Draft Determination	02/2016	6.0%	Not a current market estimate; taken from ACCC Water Pricing Principles
ESCOSA	SA Water Final determination	06/2016	6.0%	Based entirely on historical excess returns
QCA	DBCT Draft Decision	06/2016	6.5%	6.4% historical excess returns 5.4% adjusted historical excess returns 6.0% surveys 8.2% adjusted DGM 7.4% Wright (as at August 2014)
Ofgem (UK)	RIIO-ED1	11/2014	7.1%	Allowed real return on the market of 6.5%, inflation forecast of 2.4%, contemporaneous 10-year government bond yield of 2.2%.
FERC (US)	Baltimore Gas et al	02/2016	8.3%	Allowed nominal return on equity of 10.0%, contemporaneous 10-year government bond yield of 1.7%.

Source: Frontier calculations.

122 When interpreting the figures set out in Table 2, it is important to bear in mind that:

- The process of regulators relying on estimates of other regulators has an element of circularity about it;
- It is important to consider any differences in the basis for the other MRP allowances and any differences in how the other MRP allowances are used; and

<sup>92</sup> AusNet Draft Decision, Attachment 3, p. 229.

- c. The required return on the market may differ across countries.

123 For example, in relation to the second point above we note that:

- a. The ERA's decisions have been made under the National Electricity Rules and National Gas Rules and so are the decisions that are most comparable to those of the AER. Specifically, like the AER, the ERA is obliged to have regard to the prevailing conditions in the market for equity funds.<sup>93</sup>
- b. IPART currently uses a risk-free rate that is 90 basis points above the prevailing government bond yield. This equates to an MRP of 8.1% in the case where the risk-free rate is set equal to the prevailing government bond yield;
- c. The ESC has noted that it is required to follow the ACCC's Water Pricing Principles<sup>94</sup> which requires that an MRP of 6.0% must be used.<sup>95</sup> The Water Pricing Principles were set in July 2011 and the 6.0% figure was based on data through to 2008;<sup>96</sup> and
- d. ESCoSA has adopted an MRP allowance based entirely on historical excess returns and gives no weight to any method that has regard to the prevailing conditions in the market for equity funds.

124 It is also important to understand that the Ofgem and FERC estimates set out above are figures that have been derived to be comparable with the AER's MRP allowance. Specifically, under the AER's approach the nominal allowed return on the market is computed as the sum of the contemporaneous 10-year nominal government bond yield and the allowed MRP of 6.5%.

125 The Ofgem approach is to set an allowed real return on the market of 6.5%.<sup>97</sup> We add to this an estimate of 10-year "breakeven inflation" of 2.8%, estimated using the relevant data from the Bank of England as at the date of the Ofgem decision, and using the approach set out by Ofgem.<sup>98</sup> This produces a nominal market return of 9.3%. From this, we subtract the contemporaneous 10-year nominal government bond yield of 2.2%, obtained from the Bank of England.<sup>99</sup> This produces a MRP allowance of 7.1% that is on the same basis as the AER's 6.5% allowance. Both are figures that can be added to the contemporaneous 10-

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<sup>93</sup> NER 6.5.2(g); NGR 87(7).

<sup>94</sup> ESC Goulburn-Murray Final Decision, p. 1.

<sup>95</sup> ACCC Water Pricing Principles, Table 1, p. 28.

<sup>96</sup> ACCC Water Pricing Principles, p. 31.

<sup>97</sup> Ofgem, RIIO-ED1 Draft Determinations for the slow-track electricity distribution companies: Financial issues, p. 7.

<sup>98</sup> Ofgem, RIIO-T1 and RIIO-GD1 Review – Glossary of terms, p. 2.

<sup>99</sup> <http://www.bankofengland.co.uk/statistics/pages/yieldcurve/default.aspx>.

year government bond yield to produce an estimate of the nominal required return on the market.

126 We also note that, in this decision, Ofgem has stated that:

Our advisors argue and we accept that the equity market return does not necessarily decline with the risk free rate.<sup>100</sup>

127 The FERC approach is to allow a nominal return on equity for the regulated business. In its approval of the return on equity in the recent Baltimore Gas case, the nominal allowed return on equity was 10.0%, with a further 0.5% available for becoming a member of a regional transmission organisation.<sup>101</sup> We take the allowed nominal return on equity and subtract the contemporaneous 10-year government bond yield of 1.7% to produce an estimate of the MRP of 8.3%.<sup>102</sup>

## Surveys

128 The AER summarises the results of a number of surveys in its recent final decisions.<sup>103</sup> Shortly after the preparation of those decisions, Pablo Fernandez published the 2016 version of his MRP survey. The relevant outcomes of that survey are summarised in Table 3 below.

Table 3: Recent survey outcomes

Survey	Number of responses	Mean (%)	Median (%)
Fernandez et al (2016)	87	6.0%	6.0%

*Source: Fernandez, P., A. Ortiz and I F Acin, Market risk premium used in 71 countries in 2016, Unpublished working paper, University of Navarra, Spain.*

129 We note that we have previously recommended that surveys of this type should be given no material weight because:

- a. There is no information about the qualifications or expertise of the respondents;
- b. There is no information about the survey response rate, or about whether there is any bias in the response rates of different groups;
- c. The survey does not ask respondents about what they use the MRP for (e.g., classroom examples or pricing infrastructure assets);

<sup>100</sup> Ofgem, Methodology for assessing the equity market return, February 2014, p. 17.

<sup>101</sup> 154 FERC 61,125, February 23 2016, p. 2.

<sup>102</sup> Note that this is conservative in that it assumes that an equity beta of 1.0 has been used for the utility. FERC does not publish a CAPM beta point estimate, but rather sets the allowed return on equity based on consideration of a number of different models.

<sup>103</sup> AusNet Draft Decision, Attachment 3, Table 3-33, p. 218.

- d. The survey does not ask respondents whether they use the MRP in the CAPM, or some other model;
- e. The survey does not ask the respondents whether they pair their MRP response with the contemporaneous government bond yield or a higher number (as is the observed practice of many independent expert valuation professionals);
- f. The survey does not ask participants whether they have grossed-up their estimate for some assumed value of imputation credits, and if so whether they applied a theta of 0.6 or something else; and
- g. There is no information about when the survey was conducted, or about the level of government bond yields at the time the survey was conducted.

130 Moreover, the MRP figures reported in surveys are ex-imputation estimates – they have not been grossed-up to reflect the AER’s assumed value of imputation credits. Consequently, before they can be compared to the AER’s (with-imputation) 6.5% allowance, they must be adjusted. By way of example, the QCA has concluded that this adjustment requires the addition of 83 basis points.<sup>104</sup>

### **Independent expert valuation reports**

131 We have conducted a search for independent expert valuation reports that were released in 2016 and which pertained to transactions in excess of \$100 million. Since independent experts generally apply consistent approaches over time, we consider only one report per expert firm. This process produced four recent independent expert reports, as set out in Table 4 below.

Table 4: Recent independent expert valuation reports

Company name	Independent expert	Report date	Transaction value (\$ millions)
Ethane Pipeline Income Fund	Lonergan Edwards	31/03/2016	122
Pacific Brands Ltd	Grant Samuel	20/05/2016	1,055
Patties Foods Ltd	Deloitte	15/07/2016	197
STW Communications Group Ltd	KPMG	29/02/2016	338

Source: Connect 4.

132 All four experts set the required return on equity materially above the figure that would be obtained from inserting the current government bond yield and a 6.5% MRP into the SL-CAPM formula. The independent expert reports achieve the higher estimates of the required return on equity in three different ways:

<sup>104</sup> QCA, 2014, Aurizon Network, UT4 Draft Decision, p. 232.



- a. By using an estimate of the MRP higher than 6.5%;
- b. By using a risk-free rate above the contemporaneous government bond yield; and
- c. By applying an ad hoc increase to the mechanistic CAPM estimate.

133 For example, Grant Samuel begins with a mechanistic CAPM estimate of the required return on equity using the contemporaneous government bond yield and a MRP based on historical excess returns, concludes that the outcome is implausible in the prevailing market conditions, and makes a material upward adjustment.

134 Lonergan Edwards state:

In our view, the application of the current (very low) government bond yields and long-term average MRP is inappropriate in the context of determining required equity rates of return (discount rates). Theoretically, the anomalous currently low government bond interest rates could be allowed for by increasing the MRP. However, as it is difficult to reliably measure short-term movements in the MRP, we have instead increased the risk-free rate for the purposes of estimating required rates of return.<sup>105</sup>

135 KPMG also use a risk-free rate that is higher than the contemporaneous government bond yield. They specifically note that the MRP and risk-free rate must be considered jointly and not in isolation:

...the individual variables should not be considered in isolation but rather be viewed as components appropriate for the construction of a discount rate as a whole...Consideration of these components in isolation may result in an inappropriate discount rate being determined.<sup>106</sup>

136 For this reason, we consider the sum of the risk-free rate and MRP and define that to be the “required market return.” We then subtract the contemporaneous government bond yield to obtain an estimate of the “effective MRP.” These calculations are set out in Table 5 below.<sup>107</sup>

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<sup>105</sup> Lonergan Edwards, p. 47.

<sup>106</sup> KPMG, p. 85.

<sup>107</sup> Grant Samuel applies an upward adjustment at the WACC level. To find the required return on the market, we simply strip out the return on debt component for the case where beta is set to 1.

Table 5: The effective MRP used in recent independent expert valuation reports

Independent expert	Required market return	Contemporaneous government bond yield	Effective MRP
<b>Lonergan Edwards</b>	10.0%	3.1%	6.9%
<b>Grant Samuel</b>	11.2%	2.5%	8.7%
<b>Deloitte</b>	9.6%	1.8%	7.8%
<b>KPMG</b>	10.4%	2.4%	8.0%

Source: Connect 4.

137 The evidence in Table 5 is that independent experts are using estimates of the required return on equity that are materially higher than those being allowed by the AER's approach of adding a fixed 6.5% premium to the prevailing government bond yield.

138 Moreover, the MRP figures set out in Table 5 are ex-imputation estimates. Consequently, before they can be compared to the AER's 6.5% allowance, they must be grossed-up to reflect the AER's assumed value of imputation credits. By way of example, the QCA has concluded that this adjustment requires the addition of approximately 80 basis points.

139 On the issue of imputation credits, Lonergan Edwards specifically states that its WACC parameter estimates have been derived:

...without adjustment for imputation.<sup>108</sup>

and Grant Samuel conclude that:

While acquirers are undoubtedly attracted by franking credits there is no clear evidence that they will actually pay extra for them or build it into values based on long term cash flows. Accordingly, it is Grant Samuel's opinion that it is not appropriate to make any adjustment.<sup>109</sup>

140 Our preferred approach is to use estimates of the risk-free rate and MRP that are commensurate with the prevailing conditions in equity markets. In our view, the MRP that is commensurate with the prevailing conditions is materially higher than the AER's 6.5% allowance, in which case the required return on equity is materially higher than the AER's allowance.

141 Although some independent experts take a different path, they all reach the same conclusion – in the prevailing conditions in the market for equity funds, the required return on equity is materially higher than the AER's allowance.

<sup>108</sup> Lonergan Edwards, p. 45.

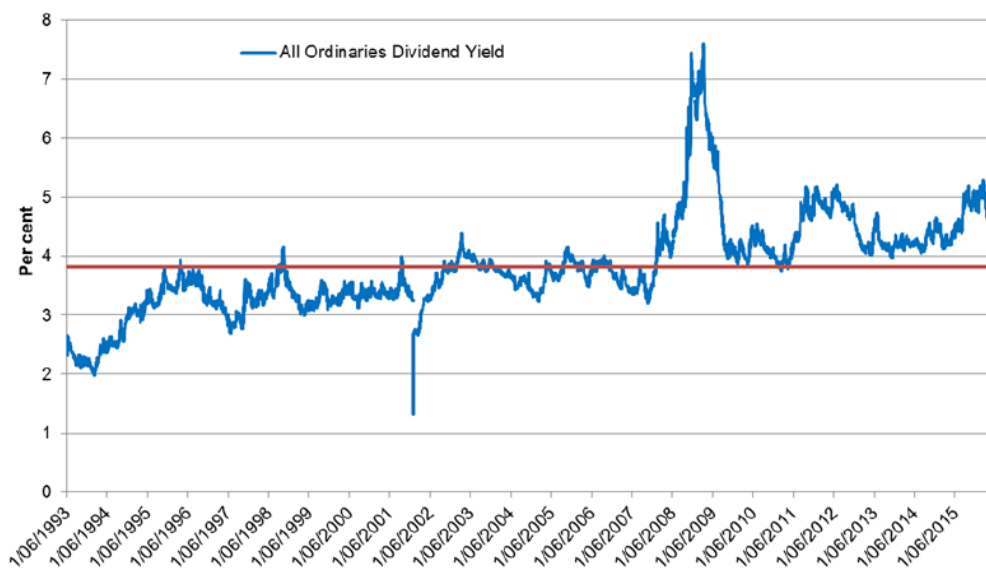
<sup>109</sup> Grant Samuel, p. 11.

### Conditioning variables

142 In its recent final decisions, the AER has regard to a number of conditioning variables as a qualitative cross check of its return on equity allowance.<sup>110</sup> We set out below updated estimates of the conditioning variables that the AER considers.

143 The ERA has recently published updated figures for the dividend yield on the broad Australian market. We reproduce that data in Figure 14 below and note that dividend yields are not as high as during the peak of the GFC but are well above pre-GFC levels and the levels that were observed during 2013-14.

Figure 14: ERA updated dividend yield figures

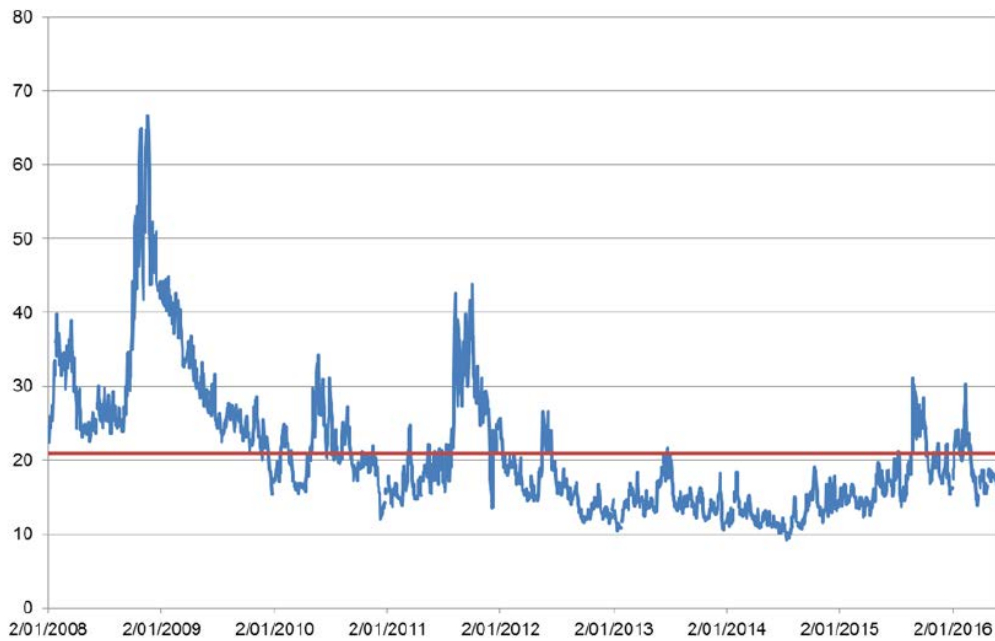


Source: ERA DBP Final Decision, Appendix 4, p. 121. Data from Bloomberg.

144 Figure 15 below sets out implied volatilities from stock index options with 30 days to maturity. This data provides an indication of expected market volatility over the subsequent month. These implied volatilities have varied within a relatively narrow band since the GFC.

<sup>110</sup> AusNet Draft Decision, Attachment 3, beginning on p. 208.

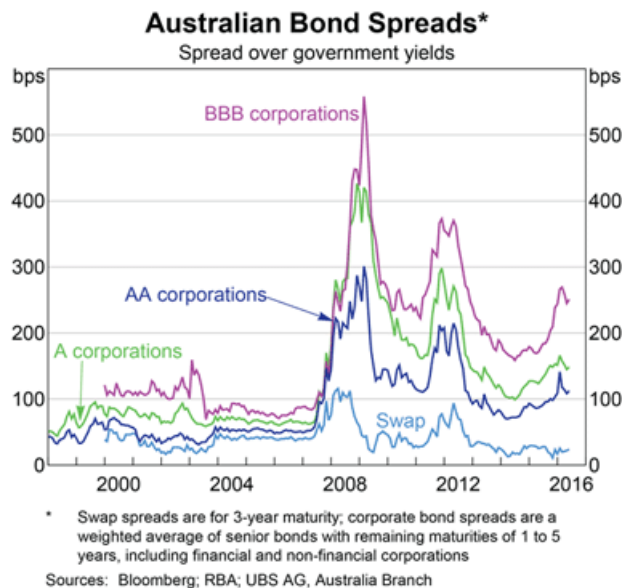
Figure 15: ERA updated option implied volatility figures



Source: ERA DBP Final Decision, Appendix 4, p. 121. Data from Bloomberg.

145 Figure 16 below sets out RBA estimates of corporate bond spreads. This figure shows that spreads have reduced since the GFC, but have increased over the last year.

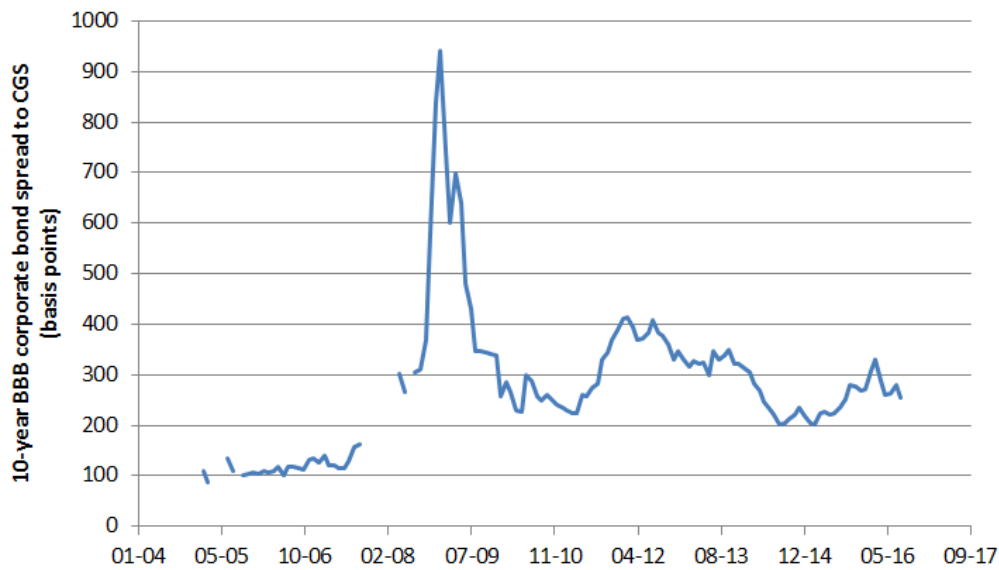
Figure 16: RBA bond spread estimates



Source: RBA Chart Pack, August 2016.

146 Figure 17 below sets out RBA estimates of 10-year BBB corporate bond spreads. This figure also shows that spreads have reduced since the GFC, but have increased over the last year.

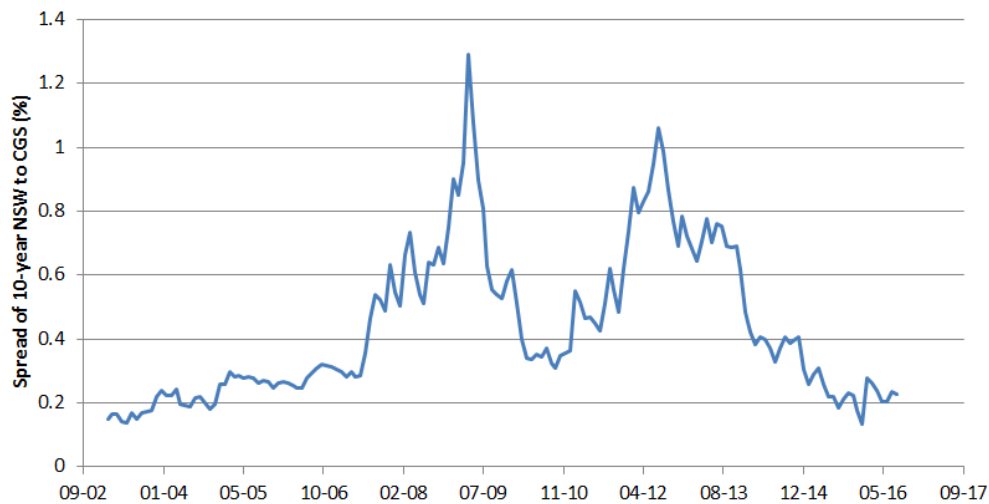
Figure 17: 10-year BBB corporate bond spreads



Source: RBA Table F3.

147 Figure 18 below sets out RBA estimates of the spread between 10-year NSW government bonds and 10-year Commonwealth government securities. This figure shows that the spread has returned to pre-GFC levels.

Figure 18: 10-year NSW-CGS bond spreads



Source: RBA Table F3.

148 In the absence of a formal econometric mapping of these conditioning variables to a point estimate of the MRP, it is difficult to know what to make of this evidence. In the prevailing market conditions of record low government bond yields, the challenge of mapping conditioning information to a point estimate of the MRP is particularly difficult. This is because some of the conditioning variables relate to required returns whereas others relate to risk premiums. For example, the dividend yield is related to overall required returns – a higher yield implies that a given set of dividends is being discounted at a higher rate. By contrast, corporate bond spreads relate to risk-premiums.

149 When government bond yields are near their long-run average levels, this distinction is much less important as risk premiums in the current and the historical data are computed by subtracting the same base risk-free rate. The analysis in the prevailing market conditions is complicated by the fact that current government bond yields are so far below the historical average over the period for which conditioning information is available.

150 Nevertheless, one conclusion that can be confidently drawn from the conditioning variable information is that it does not support the proposition that the required return on equity has plummeted by 25% since the Guideline – which is the implication of the AER’s recent decisions, as set out in Section 0 below.

### ***The application of ‘cross checks’ at the equity risk premium level***

151 The AER has also adopted the practice of applying a number of ‘cross checks’ to its equity risk premium, which is defined as the product of beta and the MRP. In our view, there are a number of problems with this approach.

#### **There is no apparent mechanism for cross checks to have any influence on allowed returns**

152 Logically, the AER’s allowed return will either pass or fail each cross check:

- a. If the allowed return passes the cross check, it is maintained and the cross check has had no impact on what the allowed return would otherwise have been;
- b. If the allowed return fails the cross check, logically, there are two possible approaches:
  - i. No adjustment is made to the original allowed return – in which case there is no point in performing the cross check; or
  - ii. An adjustment *is* made to make the allowed return consistent with the cross check – in which case the cross check overrides the primary evidence.

Since neither of these options is palatable, there is strong incentive to conclude that the allowed return passes every cross check that is applied.

153 By contrast, our preferred approach is to simply set out all of the relevant evidence and to weight each piece according to its relative strengths and weaknesses.

#### **Applying the cross check at the ‘equity risk premium’ level can be misleading**

154 The AER’s approach has been to conduct cross checks using independent expert reports and broker research at the equity risk premium level. The AER has defined the product of beta and the MRP as the equity risk premium and makes comparisons at that level. We provide two specific examples of why the AER’s application of this approach has, to date, resulted in misleading outputs.

*The AER's approach has disregarded adjustments to historical estimates to account for the prevailing market conditions*

155 The first example is the Grant Samuel independent expert report for Envestra Ltd. Grant Samuel begins with what it calls “a mechanistic application of formulae”<sup>111</sup> which involves inserting long-run historical average figures into the CAPM formula. This produces an equity risk premium range of 3.6% to 4.2%.<sup>112</sup> Grant Samuel makes a point of stating that this is an ex-imputation estimate.<sup>113</sup> The AER acknowledges that its allowed equity risk premium is a with-imputation estimate, and makes an adjustment to the Grant Samuel estimate accordingly. Adding the AER's assumed value of imputation credits to the Grant Samuel estimates produces an equity risk premium range of 4.1% to 4.8%.<sup>114</sup> The AER then concludes that, because its allowed equity risk premium of 4.55%<sup>115</sup> lies within the Grant Samuel range, it passes this cross check.

156 However, Grant Samuel goes on explain why its mechanistic application is unlikely to reflect the prevailing market conditions and that “reasonable discount rates to apply to discounted cash flow analysis for regulated energy assets in current market conditions”<sup>116</sup> are much higher. In reaching this conclusion, Grant Samuel refers to:

- a. DGM estimates of the required return on equity currently being higher than mechanistic CAPM estimates;
- b. The need to increase MRP estimates in the current market conditions;
- c. The fact that government bond yields were at historical lows such that a higher estimate may be warranted for the risk-free rate; and
- d. The fact that other market participants are using higher costs of equity capital in the current market conditions.<sup>117</sup>

157 Grant Samuel then report an increased WACC range that it considers to be consistent with the “current market conditions.”<sup>118</sup> The equity risk premium that is consistent with this increased range, grossed up to include the AER's adjustment for imputation, is 5.8% to 8.2%. The lower bound of this range is

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<sup>111</sup> Grant Samuel (2014), Appendix 3, p. 1.

<sup>112</sup> This is produced from a beta range of 0.6 to 0.7 and a MRP of 6.0%. See Grant Samuel (2014), Appendix 3, p. 7.

<sup>113</sup> This is produced from a beta range of 0.6 to 0.7 and a MRP of 6.0%. See Grant Samuel (2014), Appendix 3, pp. 9-10.

<sup>114</sup> AusNet Draft Decision, Attachment 3, p. 223.

<sup>115</sup> Produced from a beta of 0.7 and a MRP of 6.5%.

<sup>116</sup> Grant Samuel (2014), Appendix 3, p. 9.

<sup>117</sup> Grant Samuel (2014), Appendix 3, pp. 8-9.

<sup>118</sup> Grant Samuel (2014), Appendix 3, p. 9.

materially above the AER's allowance and the mid-point of this range is more than 50% above the AER's allowance.

158 In our view, the conclusion that this cross check has been passed because the AER's allowed equity risk premium is within a range that Grant Samuel has specifically disavowed as being inappropriate in the current market conditions, and which Grant Samuel corrected before using it in their valuation, is highly misleading. Even the lower bound of the range that Grant Samuel actually adopted as being appropriate for the current market conditions is materially above the AER's allowance.

*The AER's approach disregards uplifts to the risk-free rate*

159 A second example comes from the February 2016 Macquarie Research report for DUET.<sup>119</sup> That report sets out an equity risk premium (adjusted to reflect the AER's assumed value of imputation credits) of 4.7%,<sup>120</sup> which is only marginally above the AER's allowance of 4.55%.

160 However, that report adopts a risk-free rate that is 1.3%<sup>121</sup> above the contemporaneous 10-year government bond yield. Thus, the premium to the contemporaneous 10-year government bond yield is 6.0%, which is materially above the AER's allowance.

*The AER's reasons for disregarding uplifts*

161 In its recent decisions, the AER has explained its reasons for disregarding the evidence of independent experts and brokers applying uplifts to mechanistic CAPM estimates in the current market conditions as follows:

Uplifts applied by brokers and valuers to initial estimates may be inconsistent with the ARORO. They may reflect non-systematic risks, or be designed to account for risks not addressed in cash flow forecasts, or (to the extent there is any) the expectation of outperformance of regulatory allowances. They may also reflect the term structure of the proxies used to estimate the risk free rate and/or market risk premium, the relevant investment period exceeding the term of the proxies, and the one-off nature of transactions on which they are advising (which differs from our regulatory task where the rate of return is reassessed for each regulatory control period).<sup>122</sup>

162 The AER has provided no evidence that any of the conjectured issues have actually affected any of the reports that it considers. By contrast, the Grant Samuel Envestra report clearly states that the uplift is made because the mechanistic CAPM approach (on which the AER relies) does not produce appropriate estimates in the current market conditions – as set out above. In our view, the evidence that the independent expert has made an adjustment to its mechanistic CAPM estimate because it considers that to be required in the prevailing market conditions is relevant evidence that should not be disregarded.

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<sup>119</sup> Macquarie Research, 2016, DUET Group, February.

<sup>120</sup>  $0.8 \times (5.0\% + 0.83\%) = 4.7\%$ .

<sup>121</sup> 3.8% vs. 2.5%.

<sup>122</sup> AusNet Draft Decision, Attachment 3, p. 84.



163 Moreover, in its recent decisions, the AER has established a seemingly impossible burden of proof in relation to adjustments to the risk-free rate. On this point, the AER conjectures that it is possible that brokers and experts may adopt a risk-free rate above the contemporaneous government bond yield, not because they think that is required to produce sensible estimates of the required return in the prevailing market conditions, but because they use a term structure whereby they apply a lower discount rate to cash flows over the next 10 years. The AER provides no evidence of any broker or independent expert making any mention of this conjectured term structure approach. The AER then states that it will continue to disregard the uplifts that brokers and independent experts apply to the risk-free rate because no stakeholder has “provided compelling evidence that valuers do not adjust risk free rate estimates to account for term structure.”<sup>123</sup> That is, the task for stakeholders is to prove a negative – that valuers have not used an approach that none of them have mentioned.

### **Cross checks should not be applied at the ‘equity risk premium’ level**

164 NER 6.5.2(f) and 6.5.2(g) state that:

(f) The return on equity for a *regulatory control period* must be estimated such that it contributes to the achievement of the *allowed rate of return objective*.

(g) In estimating the return on equity under paragraph (f), regard must be had to the prevailing conditions in the market for equity funds.

165 That is, the Rules require that the *return on equity* must be commensurate with the efficient financing costs of the benchmark efficient entity and with the prevailing conditions in the market. By contrast, the equity risk premium is only one part of the overall return on equity. Even if it were the case that the equity risk premium allowed by the AER were consistent with that adopted by some market practitioners, the task would not finish there – it would still be necessary to consider the other elements of the return on equity. As set out above, there is evidence that market practitioners regularly adopt higher risk-free rates and apply other uplifts to the return on equity. Moreover, these adjustments and uplifts tend to increase in frequency and magnitude as government bond yields fall – as they have in the prevailing market conditions. Thus, a cross check that ignores these elements will be incomplete.

166 In summary, we cannot test whether the *return on equity* is commensurate with the efficient financing costs of the benchmark efficient entity and with the prevailing conditions without considering the entire return on equity. A cross check of one component of the return on equity will be incomplete – and the problem is likely to be exacerbated in the current market conditions where government bond yields are at record lows.

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<sup>123</sup> AusNet Draft Decision, Attachment 3, p. 84.

### Comparing ‘with imputation’ estimates with ‘ex imputation’ estimates is misleading

167 The AER notes that its equity risk premium figures include its assumed value of imputation credits whereas the figures reported by independent experts and brokers do not. Thus, the AER makes an adjustment for imputation to provide a like-with-like comparison. However, the AER continues to report the ex-imputation estimates, giving them equal billing (and apparently equal weight) with the properly adjusted and comparable with-imputation estimates.<sup>124</sup>

168 The AER states that its continued reliance on ex-imputation adjustments is on the basis that the MRP estimates may have been supplied to the broker or independent expert by some third party, who might have grossed them up to account for the value of imputation credits that the AER has used such that the estimates are in fact already comparable:

...it is unclear the extent to which these estimates may be based on third party estimates that already account for the value of imputation credits.<sup>125</sup>

169 However, by way of one example, Grant Samuel very clearly state that their estimates have not been adjusted for any assumed benefit of imputation in any way,<sup>126</sup> and this is the standard approach adopted by independent experts.

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<sup>124</sup> See, for example, AusNet Draft Decision, Attachment 3, pp. 221-223.

<sup>125</sup> AusNet Draft Decision, Attachment 3, p. 85.

<sup>126</sup> Grant Samuel (2014), Appendix 3, p. 10.

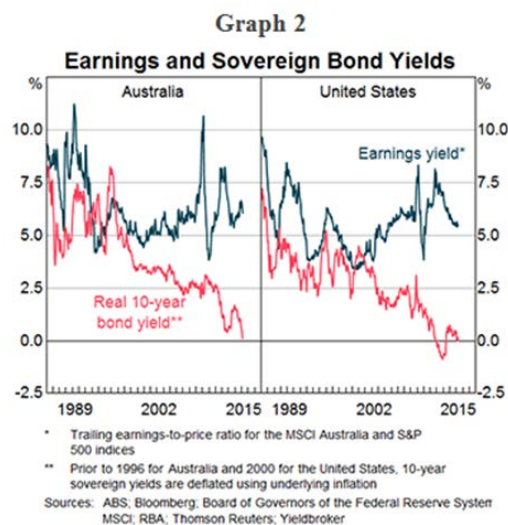
## 5 Views from the market

170 Evidence from a range of market participants is consistent with the weight of evidence set out above – that the required return on equity has remained relatively stable even as government bond yields have fallen. Market participants do not agree with the AER’s view that the GFC, and the recent dramatic decline in government bond yields, resulted in a material one-for-one fall in the required return on equity.

### 5.1 Reserve Bank of Australia

171 In April 2015, Reserve Bank Governor Glenn Stevens stated that the equity risk premium appears to have risen to offset the recent falls in the risk-free rate such that the required return on equity has not fallen:

...post-crisis, the earnings yield on listed companies seems to have remained where it has historically been for a long time, even as the return on safe assets has collapsed to be close to zero (Graph 2). **This seems to imply that the equity risk premium observed *ex post* has risen even as the risk-free rate has fallen and by about an offsetting amount.**<sup>127</sup>



172 Governor Stevens went on to note that the returns on equity required by investors have not shifted even though risk-free rates have fallen to exceptionally low levels:

...it might be explained simply by stickiness in the sorts of ‘hurdle rates’ that decision makers expect investments to clear. I cannot speak about US corporates, but this would seem to be consistent with the observation that we tend to hear from Australian liaison contacts that **the hurdle rates of return that boards of directors apply to investment propositions have not**

<sup>127</sup> Glenn Stevens, Speech to the Australian American Association, New York, 21 April 2015. Emphasis added.

**shifted, despite the exceptionally low returns available on low-risk assets.**<sup>128</sup> [Emphasis added]

173 He goes on to further consider the explanation that:

...the risk premium being required by those who make decisions about real capital investment has risen by the same amount that the riskless rates affected by central banks have fallen.<sup>129</sup>

## 5.2 The Federal Reserve Bank

174 In a recent paper for the Federal Reserve Bank of New York, Duarte and Rosa (2015) estimate 20 models of the MRP (which they call “ERP” for equity risk premium). They conclude that the ERP is currently at elevated levels – even above the levels reached during the GFC:

In this article, we estimate the ERP by combining information from twenty prominent models used by practitioners and featured in the academic literature. Our main finding is that the ERP has reached heightened levels. The first principal component of all models –a linear combination that explains as much of the variance of the underlying data as possible– places the one-year-ahead ERP in June 2012 at 12.2 percent, above the 10.5 percent that was reached during the financial crisis in 2009.<sup>130</sup>

175 They conclude that the reason for the elevated ERP is that the required return on equity remains at normal levels even as government bond yields have fallen to exceptionally low levels:

Our analysis provides evidence that the current level of the ERP is consistent with a bond-driven ERP: expected excess stock returns are elevated not because stocks are expected to have high returns, but because bond yields are exceptionally low. The models we consider suggest that expected stock returns, on their own, are close to average levels.<sup>131</sup>

## 5.3 McKinsey Inc.

176 Dobbs, Koller and Lund (2014) from McKinsey Inc. examine the impact of the recent world-wide decline in government bonds yields. Like the Reserve Bank and independent valuation experts, they note that the required return on equity appears to be quite stable even as government bond yields decline materially. They observe that equity investors and corporate managers have maintained stable required returns – they have not reduced required returns one-for-one with recent declines in government bond yields:

...a “rational expectations” investor who takes a longer-term view should regard today’s ultra-low rates as temporary and therefore likely will not reduce

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<sup>128</sup> Glenn Stevens, Speech to the Australian American Association, New York, 21 April 2015. Emphasis added.

<sup>129</sup> Glenn Stevens, Speech to the Australian American Association, New York, 21 April 2015.

<sup>130</sup> Duarte and Rosa (2015), p. 1.

<sup>131</sup> Duarte and Rosa (2015), p. 20.

the discount rate used to value future cash flows. Moreover, such investors may assign a higher risk premium in today's environment. Our conversations with management teams and corporate boards suggest that they take a similar approach when they consider investment hurdle rates. None of those with whom we spoke have lowered the hurdle rates they use to assess potential investment projects, reflecting their view that low rates will not persist indefinitely.<sup>132</sup>

177 Dobbs, Koller and Lund (2014) also note that the empirical evidence supports the proposition that the required return on equity has remained stable, even as government bond yields have fallen:

Empirically, if investors did reduce their discount rate on future corporate-earning streams, we would expect to see P/E<sup>133</sup> ratios rise. Over the last several years of QE,<sup>134</sup> however, P/E ratios have remained within their long-term average range.<sup>135</sup>

178 That is, if the required return on equity had fallen in line with the fall in government bond yields (as the AER's allowed returns would suggest), we would see an increase in P/E ratios. However, in the prevailing conditions in the Australian market, the exact opposite has occurred – P/E ratios have generally *fallen* with the recent decline in government bond yields, as set out in Figure 19 below. This is consistent with recent increases, rather than decreases, in required returns. Indeed, the correlation between Australian P/E ratios and the 10-year government bond yield has been positive 0.65 in the period since November 2012.

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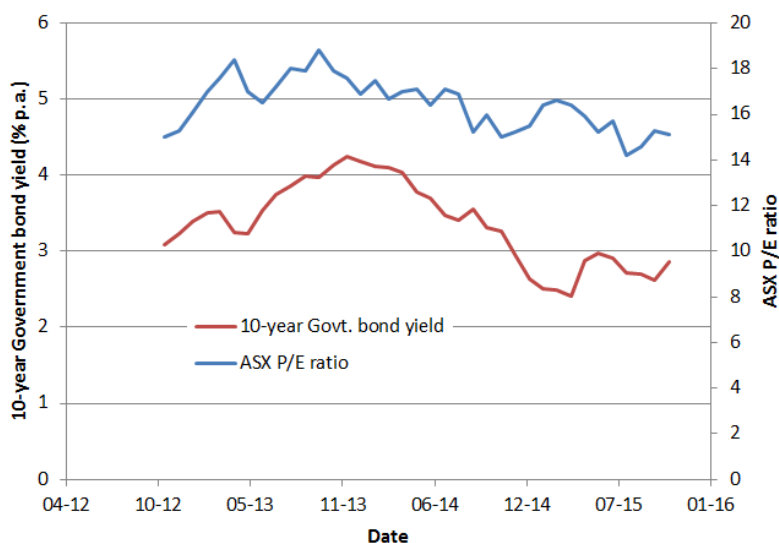
<sup>132</sup> Dobbs, Koller and Lund (2014), p. 17.

<sup>133</sup> This is a reference to the price-earnings ratio, the ratio of the price per share to earnings per share. It is the inverse of the earnings yield that is the subject of Figure 2 in Stevens (2015).

<sup>134</sup> Quantitative easing is a reference to the expansive monetary policy that has been employed by many central banks since the onset of the GFC.

<sup>135</sup> Dobbs, Koller and Lund (2014), p. 17.

Figure 19: Australian P/E ratios and government bond yields



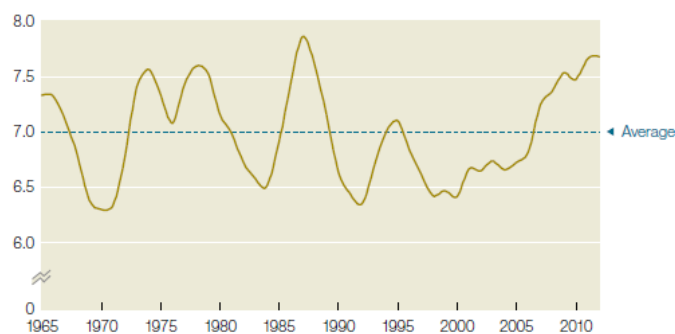
Source: RBA Tables f07 and f02.

179 Dobbs, Koller and Lund (2014) go on to report that the implied real required return on equity has remained stable – within a narrow band even as government bond yields have varied materially. They summarise this evidence in Figure 20 below.

Figure 20: Implied real required return on equity

**The implied real cost of equity in the United States has remained within the historical norms.**

Implied real cost of equity, 3-year moving average, %



Source: Dobbs, Koller and Lund (2014), Exhibit 2, p. 17.

180 They conclude that this evidence suggests that equity investors have offset the decline in government bond yields by adopting a higher market risk premium – leaving the required return on equity largely unchanged:

Since 2000, this implied real cost of equity has been rising steadily, but it has remained well within the historical range since the start of the crisis (Exhibit 2). This implies that even if investors believe the risk-free rate has fallen, they have offset this with a higher equity risk premium.<sup>136</sup>

<sup>136</sup> Dobbs, Koller and Lund (2014), pp. 17-18.

In another very recent McKinsey publication, Dobbs, Koller, Lund, Ramaswamy, Harris, Krishnan and Kauffman (2016) also conclude that the cost of equity capital has not declined with the recent declines in government bond yields:

...our analysis shows that over the past 50 years the real cost of equity has usually stayed within a narrow band of 6 to 8 percent, averaging about 7 percent. This has remained the case even with ultra-low interest rates. This indicates that even if investors believe the risk-free rate has fallen because of a decline in government bond yields, they have offset this with a higher equity risk premium. Alternately, it may be that investors do not view the government bond rate as the appropriate proxy for the risk-free rate, particularly in today's environment.<sup>20</sup> In either case, the total cost of equity for the average company does not appear to have benefited from ultra-low interest rates. If it had, we would expect to see PE ratios and stock prices substantially above today's levels. This is consistent with the discount rates we observe companies and bankers using to evaluate and price acquisitions. It is also consistent with our observation that most management teams and corporate boards have not reduced their investment hurdle rates or minimum returns for projects.<sup>137</sup>

## 5.4 NERA – US

181 In a report titled *The decoupling of treasury yields and the cost of equity for public utilities*, Strunk (2014) begins by identifying that current financial market conditions are unique in terms of an:

...unprecedented trend in the current capital markets—specifically, intervention by the Federal Reserve in the government bond market. The current capital market conditions are unique from a historical perspective.<sup>138</sup>

182 He goes on to note that government bond yields are currently at historical lows, and thus questions the use of the historical excess returns approach to estimating the MRP in the current market conditions:

Current capital market conditions raise doubts about whether the risk premium, measured using historical data, is applicable today. Rate-of-return models that rely upon the historical premium assume that investors' total return expectations move in lock step with treasury yields. Hence, if the historic premium is still valid, it implies a significant decrease in required returns on equity for both industrial firms and public utilities.<sup>139</sup>

183 He proposes that the DGM method is likely to produce a more reliable estimate of the MRP in the current market conditions:

NERA estimates the forward-looking risk premium using the well-established dividend growth model...This approach has the advantage that it incorporates the most recent information from capital markets and thus is most consistent with the intent of any cost of equity calculation, which is to reflect current forward-looking expectations.<sup>140</sup>

<sup>137</sup> Dobbs, Koller, Lund, Ramaswamy, Harris, Krishnan and Kauffman (2016), p. 12.

<sup>138</sup> Strunk (2014), p. 1.

<sup>139</sup> Strunk (2014), p. 1.

<sup>140</sup> Strunk (2014), p. 2.

184 Of course, in conditions where the required return on equity is remaining quite stable while government bond yields are falling, the DGM method produces higher estimates of the MRP:

In its most recent analysis, NERA found the forward-looking risk premium to be 8.36 percent, which compares to a historic risk premium of 6.70 percent, a difference of 166 basis points. This shows that the use of a historic risk premium would significantly understate the cost of equity for utilities.<sup>141</sup>

185 Strunk goes on to note that US regulators have factored this evidence into recent rate decisions by setting an allowed return on equity that has been very stable over time, even as government bond yields have declined materially. He shows that the average allowed return on equity has varied within a narrow range of 10 to 10.5 per cent even as government bond yields declined from 4.91% to 2.92%.<sup>142</sup> A stable return on equity allowance is achieved by adopting a higher MRP in the current market conditions of low government bond yields:

...regulators implicitly recognize the higher equity risk premium that prevails in today's market. They do so by approving rates-of-return that contain a higher premium over government bond yields than has historically prevailed.<sup>143</sup>

186 Strunk concludes that:

Most important is making sure that the rate of return somehow incorporates the current forward-looking investor expectations and does not rely solely upon unadjusted historic expectations.<sup>144</sup>

## 5.5 The Economic Regulation Authority

187 In its recent ATCO Gas Final Decision, the ERA increased its MRP estimate from 5.5% to 7.6% to offset the fall in its estimate of the risk-free rate, stating that:

...the Authority has now concluded that it is not reasonable to constrain the MRP to a fixed range over time. The erratic behaviour of the risk free rate in Australia to date, and more particularly, its pronounced decline in the current economic environment, leads to a situation where the combination of a fixed range for the MRP and prevailing risk free rate may not result in an outcome which is consistent with the achievement of the average market return on equity over the long run.<sup>145</sup>

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<sup>141</sup> Strunk (2014), p. 2.

<sup>142</sup> Strunk (2014), Table 1, p. 2.

<sup>143</sup> Strunk (2014), p. 3.

<sup>144</sup> Strunk (2014), p. 3.

<sup>145</sup> ERA, ATCO Gas Final Decision, Paragraph 1173.



## 5.6 IPART

188 IPART applies a default 50% weight to forward-looking estimates of the MRP –  
 primarily a number of DGM specifications.<sup>146</sup> In its most recent update, IPART  
 adopts a contemporaneous MRP of 7.9%.<sup>147</sup>

## 5.7 Ofgem

189 In a report for UK regulator Ofgem, Wright and Smithers (2014) consider how  
 the recent decline in government bond yields might affect the approach to  
 estimating the MRP.

190 They begin with a consideration of the earlier Smithers & Co report by Wright,  
 Mason and Miles (2003),<sup>148</sup> which proposes that the real required return on equity  
 should be assumed to be constant on the basis of data from long-term historical  
 averages of realised stock returns. Wright and Smithers note that this approach  
 (which the AER refers to as the “Wright approach”) has been employed  
 consistently by UK regulators since then.

191 Wright and Smithers (2014) conclude that:

... the [UK’s Competition Commission] has given at least some weight to a  
 model in which the expected market return is assumed to have been pulled  
 down by falls in the risk-free rate. In Mason et al we argued against this model,  
 pointing to the lack of any historical stability in the risk-free rate, and hence in  
 estimates of the market equity premium. We believe that recent events have  
 simply added to the weight of evidence against this approach.

In contrast the Mason et al/Ofgem approach implies a counter-cyclical equity  
 premium, which is consistent with some more recent academic research, and  
 with recent patterns in observable proxies for risk premia such as corporate  
 bond spreads. It also has the advantage of providing stability in the regulatory  
 process.

**We conclude that there is no plausible case for any further downward  
 adjustment in the assumed market cost of equity based on recent  
 [downward] movements in risk-free rates.**<sup>149</sup> [Emphasis added]

192 They go on to conclude that:

Thus both historical and more recent evidence point to the same conclusion: in  
 contrast to the stock return there is no evidence of stability in the risk-free rate,  
 at any maturity. As a direct implication, there is no evidence of stability of the  
 market equity premium. Without such evidence, **there is no empirical basis  
 for the assumption that falls in risk-free rates should translate to falls in  
 expected market returns.**<sup>150</sup> [Emphasis added]

<sup>146</sup> IPART, Review of WACC Methodology, December 2013.

<sup>147</sup> IPART, WACC Biannual update, August 2015.

<sup>148</sup> Wright and Smithers (2014) refer to this earlier paper as “Mason et al.”

<sup>149</sup> Wright and Smithers (2014), p. 2.

<sup>150</sup> Wright and Smithers (2014), p. 15.

## 5.8 Federal Energy Regulatory Commission (FERC): New England rate case

193 In a recent decision, the US Federal Energy Regulatory Commission (FERC) noted that its previous approach had been to adjust the allowed return on equity (ROE) in lockstep with changes in the relevant government bond yield, the practice that has been maintained by the AER since its 2013 Guideline:

The Commission's practice traditionally has been to adjust the ROE using a 1:1 correspondence between the ROE and the change in U.S. Treasury bond yields—i.e., for every basis point change in the U.S. Treasury bond yield the Commission would adjust the ROE by one basis point.<sup>151</sup>

194 However, FERC concluded that in the prevailing market conditions such an approach “may not produce a rational result,”<sup>152</sup> and that:

Upon consideration of the record evidence in this proceeding, and in light of the economic conditions since the 2008 market collapse more generally, U.S. Treasury bond yields do not provide a reliable and consistent metric for tracking changes in ROE.<sup>153</sup>

195 The primary reason for FERC's conclusion is that:

The capital market conditions since the 2008 market collapse and the record in this proceeding have shown that there is not a direct correlation between changes in U.S. Treasury bond yields and changes in ROE.<sup>154</sup>

## 5.9 Federal Energy Regulatory Commission (FERC): New York rate case

196 In another recent decision, FERC concluded that inserting the historical excess returns estimate of the MRP into the CAPM is likely to produce an unreliable estimate of the required return on equity:

Given the recent trends of near-historic low yields for long-term U.S. Treasury bond rates, the CAPM's input for the “risk-free” rate, we find that it is a reasonable assumption that the current equity risk premium (which is added to the risk-free rate to calculate the cost of equity data point that determines the slope of the CAPM curve) exceeds the 86-year historical average used as the consultants' CAPM input.<sup>155</sup>

197 FERC identified the problem with a mechanistic implementation of the CAPM as follows:

The current low treasury bond rate environment creates a need to adjust the CAPM results, consistent with the financial theory that the equity risk premium

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<sup>151</sup> FERC Opinion 531, Docket EL11-66-001, June 2014, Paragraph 159.

<sup>152</sup> FERC Opinion 531, Docket EL11-66-001, June 2014, Paragraph 159.

<sup>153</sup> FERC Opinion 531, Docket EL11-66-001, June 2014, Paragraph 160.

<sup>154</sup> FERC Opinion 531, Docket EL11-66-001, June 2014, Paragraph 158.

<sup>155</sup> FERC Docket ER14-500-000, January 2014, pp. 35-36.

exceeds the long-term average when long-term US Treasury bond rates are lower than average, and vice-versa.<sup>156</sup>

198 FERC allowed a return on equity of 12.5%:

We find that NYISO's<sup>157</sup> proposed ROE<sup>158</sup> value of 12.5 percent is adequately supported by substantial evidence.<sup>159</sup>

## 5.10 Federal Energy Regulatory Commission (FERC): New York rate case

199 In the *Bangor Hydro* case that addresses a range of issues relating to setting the allowed return on equity, FERC noted that it had previously rejected CAPM analyses that were “based on historic market risk premiums.” FERC accepted the CAPM analysis in the current case because the present:

CAPM analysis is based on forward-looking investor expectations for the market risk premium.<sup>160</sup>

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<sup>156</sup> FERC Docket ER14-500-000, January 2014, pp. 35-36.

<sup>157</sup> New York Independent System Operator.

<sup>158</sup> Allowed return on equity.

<sup>159</sup> FERC Docket ER14-500-000, January 2014, pp. 35-36.

<sup>160</sup> FERC Docket EL11-66-001, p. 71.

## 6 The implications of a “nearly constant” approach to the MRP

### 6.1 The AER’s approach is to set a nearly constant MRP allowance

200 Since the Guideline, the AER has allowed an MRP of 6.5% in every one of its draft and final decisions. The AER also adopted an MRP of 6.5% in its previous review of WACC parameters in 2009. In every decision since its inception, the AER has allowed an MRP of either 6.0% or 6.5%.

201 Although the AER’s position is that “the MRP likely varies over time,”<sup>161</sup> the AER’s consultants now recognise that the AER’s approach is to set an effectively constant MRP allowance:

The AER decisions hold the risk premium nearly constant (although upward adjustments of 0.5% have been made). As (sic) result the regulated return tends to fall 1 for 1 with falls in the risk free rate.<sup>162</sup>

### 6.2 The allowed return on equity falls one-for one with falls in government bond yields

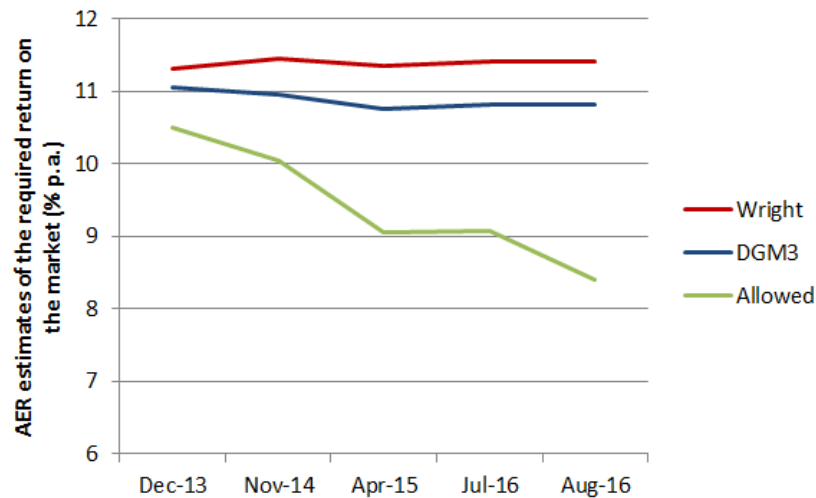
202 As Partington and Satchell (2016) note above, the inevitable consequence of setting a nearly constant MRP is that the allowed return on equity falls one-for-one with falls in government bond yields. The AER adds its constant risk premium to the contemporaneous government bond yield and the sum is adopted as the allowed return on equity. Since government bond yields have fallen sharply since the Guideline, the AER’s allowed return on equity has also fallen correspondingly. This occurs in spite of the evidence set out above – including the AER’s own DGM estimates – that the required return on equity has remained remarkably stable since the Guideline. The distinction between the AER’s estimates and its regulatory allowance is summarised in Figure 21 below.

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<sup>161</sup> AER (2013), Rate of Return Guideline: Explanatory Statement, p. 91.

<sup>162</sup> Partington and Satchell (2016), p. 17.

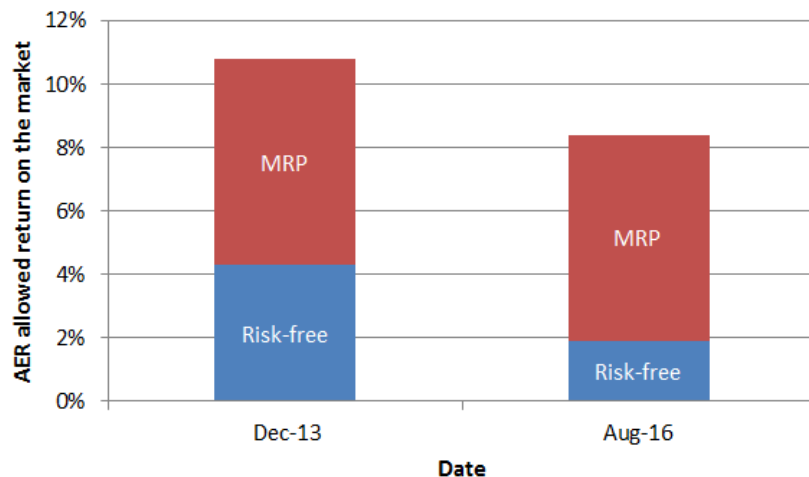
Figure 21: The required return on the market – AER estimates and allowances



Source: Rate of Return Guideline, Explanatory Statement, Appendix; Ausgrid Draft Decision Attachment 3; Ausgrid Final Decision Attachment 3; AusNet Draft Decision Attachment 3.

203 Since its Guideline in December 2013, the yield on 10-year government bonds has fallen from 4.1% to 1.9%.<sup>163</sup> The AER has maintained the same 6.5% MRP in every one of its decisions since December 2013. Thus, the AER considers that the required return on equity for the average firm<sup>164</sup> has fallen from 10.6%<sup>165</sup> in December 2013 to 8.4%<sup>166</sup> now. This represents a decline of more than 25% over the last two and a half years, as illustrated in Figure 22 below.

Figure 22: AER estimate of the required return on equity for an average firm



Source: AER Rate of Return Guideline, December 2013; MRP allowance from AusNet Draft Decision, May 2016; RBA current 10-year government bond yield August 2016.

<sup>163</sup> <http://www.rba.gov.au/statistics/tables/xls/f02hist.xls>.

<sup>164</sup> Which, under the CAPM, is equal to the sum of the risk-free rate and the MRP.

<sup>165</sup> 4.1% + 6.5%.

<sup>166</sup> 1.9% + 6.5%.

204 By contrast, as set out above, there is a substantial body of evidence to support the propositions that:

- a. Real-world investors do **not** determine the return that they require by simply adding a constant figure to the contemporaneous government bond yield; and
- b. The required return on equity has **not** fallen by over 25% in the last two and a half years.

205 The broader effect of the AER's approach to distilling the MRP evidence into a single regulatory allowance is illustrated in Figure 23. That figure contrasts the AER's allowance for the required return on the market with mid-point estimates from the AER's three-stage DGM.<sup>167</sup>

206 The most obvious point of departure is during the global financial crisis (GFC) in late 2008. The approach of applying a fixed premium to the contemporaneous government bond yield implies that the required return on equity *fell* dramatically during the peak of the GFC – as investors moved funds into government bonds, lowering yields. Such an outcome is obviously implausible – the required return on equity capital does *not* fall materially during financial crises. Of course it is absurd to suggest that equity capital becomes cheaper and more abundant during financial crises. But that is precisely what the 'fixed premium' approach to setting the MRP suggests. By contrast, the AER's own forward-looking DGM method suggests that the required return on equity increased during the GFC.

Figure 23: The required return on the market – AER mid-point DGM estimates and regulatory allowances



Source: Frontier Economics.

207 Figure 23 also shows that the divergence between the two methods is not confined to the peak of the GFC. For example, throughout 2007 when equity

<sup>167</sup> That is, estimates based on the AER's specification and implementation of the DGM with a long-run growth rate of 4.6%.

prices were very high and it is widely accepted that equity capital was relatively cheap, the AER-style fixed premium approach suggests that the cost of equity capital was very high.

208 During average market conditions, when government bond yields are closer to their long-run mean, both approaches produce similar estimates of the required return on equity. This is the case through 2002-2005.

209 Importantly, the two approaches currently suggest very different required returns. Whereas the DGM method suggests that the required return on equity has remained quite stable since 2013 (hovering around 11%), the AER allowance suggests a material decline in the cost of equity.

### 6.3 The source of the problem

210 We have shown above that the AER's approach to setting the MRP allowance produces implausible outcomes in some market conditions, including the current market conditions. These implausible outcomes arise because the AER's estimation approach produces a nearly constant estimate of the MRP – either 6.0% or 6.5% in every decision since its inception. This results in an allowed return on equity that is volatile – it rises and falls one-for-one with every change in government bond yields.

211 In some market conditions, the true required return on equity may well fall when government bond yields fall. However, in other market conditions the required return on equity may stay constant, or even rise, as government bond yields fall. It depends on the reasons why the government bond yield has fallen.

212 The problem with the AER approach is that it assumes that the required return on equity **always** falls one-for one with **every** decline in government bond yields. This unwavering assumption leads to implausible estimates in some market conditions, including the current market conditions.

213 In this regard, Partington and Satchell (2016) have recently advised the AER that:

We begin by stating our position that it seems likely that the risk premium changes over time. It is also entirely possible that the risk premium sometimes changes at the same time as interest rates change, but that change may either be in the same direction as the interest rates, or in the opposite direction. At any point in time, there are three possibilities for the market risk premium, it may remain unchanged, it may go down, or it may increase. There is no compelling reason for an interest rate decrease to automatically be associated with an increase in the market risk premium.<sup>168</sup>

214 We agree with everything that Partington and Satchell have said in the above paragraph. However, just as there is “no compelling reason for an interest rate decrease to automatically be associated with an increase in the market risk

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<sup>168</sup> Partington and Satchell (2016), p. 17.

premium,” there is equally no compelling reason for an interest rate decrease to *never* be associated with an increase in the market risk premium.

215 This is the crux of the problem with the AER’s nearly constant MRP. Even though government bond yields have halved since the Guideline, and even though there is strong evidence that the real-world required return from equity holders has not fallen one-for-one with those yields, the AER has maintained the same MRP allowance.

216 We do not suggest that the AER should *always* increase the MRP allowance *whenever* the government bond yield falls or that any increase should completely offset the fall in yields. We simply suggest that the AER should *sometimes* increase the MRP allowance to *partially* offset the fall in yields – when objective evidence supports that course of action. The problem is that the historical experience has been that the AER’s approach has not permitted *any* increase in the MRP to offset *any* of the material decline in government bond yields that has occurred since the Guideline. In our view, the prevailing market conditions support an increase in the MRP to partially offset the recent material decline in government bond yields.



## 7 The reliability of DGM estimates of the MRP

### 7.1 Context

217 Because the long-run mean of historical excess returns is effectively constant  
over time, if the MRP is set predominantly on the basis of that evidence the  
allowed MRP will be nearly constant over time – reflecting the long-run average  
of historical outcomes.

218 To obtain an estimate of the MRP that is forward-looking and commensurate  
with the prevailing conditions in the market, some material weight would have to  
be applied to forward-looking estimates that are based on prevailing market  
prices.

219 In this regard, the AER has stated that, but for some concerns about DGM  
estimates not being perfectly reliable, it would adopt the DGM estimate as the  
allowed MRP:

If a perfectly reliable estimate of the MRP could be generated from market  
prices it would be reasonable to use this estimate. However, no such estimate  
exists.<sup>169</sup>

220 The AER has further stated that, while it has some concerns about the reliability  
of input assumptions, those concerns must be weighed against the positive  
features of DGM estimates:

Notwithstanding our concerns about the reliability of input assumptions, we  
consider DGM estimates have strong theoretical grounding and are more likely  
to reflect prevailing market conditions than other approaches.<sup>170</sup>

221 This has led the AER to adopt a preferred approach to implementing the DGM  
to minimise its concerns. The AER describes its preferred approach as:

...the most significant development in this area<sup>171</sup>

and states that it gives:

...significant consideration to DGM estimates of the MRP.<sup>172</sup>

222 The AER has also noted that it is important for it to have regard to information  
“symmetrically” through time:

...it is important we apply different sources of evidence symmetrically through  
time to avoid bias...Asymmetric application of evidence may lead to biased  
outcomes. In contrast, we propose to consider each source of evidence  
symmetrically through time.<sup>173</sup>

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<sup>169</sup> AER (2013), Rate of Return Guideline: Explanatory Statement, Appendices, p. 110.

<sup>170</sup> AER (2013), Rate of Return Guideline: Explanatory Statement, Appendices, p. 85.

<sup>171</sup> AER Rate of Return Guideline, Explanatory Statement, Appendices, p. 89.

<sup>172</sup> AER Rate of Return Guideline, Explanatory Statement, p. 97.

<sup>173</sup> AER (2013), Rate of Return Guideline: Explanatory Statement, p. 92.

and that its preferred DGM specification enables the AER to consider the DGM evidence symmetrically:

...we have greater confidence in the symmetry of this information through time and give these estimates greater consideration than we have in the past.<sup>174</sup>

223 Consistent with a symmetric approach to the evidence, the AER has stated in its most recent decisions that:

We have not changed the weight we apply to the dividend growth model.<sup>175</sup>

224 In summary:

- a. The AER has stated that the DGM approach has the attractive features of being a forward-looking estimate that is more likely to reflect the prevailing market conditions than other approaches;
- b. The AER has expressed some concerns about the reliability of input parameters, but states that these concerns are mitigated by its preferred implementation; and
- c. The AER applies “significant” weight to its DGM evidence and has not reduced that weight since the Guideline.

## 7.2 AER concerns

225 In this sub-section, we consider each of the concerns that the AER has documented in relation to the DGM estimates of the MRP. The AER’s four concerns have recently been set out in its May 2016 Final Decisions.

### ***Slow-changing dividends***

226 The AER correctly points out that corporate dividends are more stable over time than corporate earnings. Thus, it is possible that a firm may seek to maintain its dividend through a period of weaker earnings. Of course, this is only possible for a short period – if earnings are persistently weak, maintaining the dividend becomes unsustainable. Thus, if a firm is anticipating weaker earnings for a prolonged period, it is highly unlikely that it would *increase* its dividend.

227 On this point, the AER notes<sup>176</sup> our submission that analysts are currently forecasting growth in dividends and earnings over the standard two-year forecast period. This is inconsistent with the notion that dividends are currently being artificially sustained in the face of what is expected to be weak earnings in the future.

228 In response, the AER posits that it is possible that, although analysts are forecasting robust earnings growth over the next two years, they may consider that earnings in the more distant future are likely to be insufficient to sustain the

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<sup>174</sup> AER Rate of Return Guideline, Explanatory Statement, p. 96.

<sup>175</sup> AusNet Draft Decision, Attachment 3, p. 207.

<sup>176</sup> AusNet Draft Decision, Attachment 3, p. 206.

current level of dividends.<sup>177</sup> While this is a theoretical possibility, it seems highly unlikely that analysts would forecast dividend growth based on strong earnings over the short term if they considered those dividends to be unsustainable in the longer term. Moreover, the AER has provided no evidence to support its conjecture.

229 The AER also refers to a figure in the RBA Chartpack<sup>178</sup> and concludes that:

RBA data suggests that forecast growth in earnings per share will likely slow over the 2015-16 and 2016-17 financial years.<sup>179</sup>

230 The AER appears to have interpreted the figure in question incorrectly. The figure clearly shows that analysts are currently forecasting 2017 earnings to be higher than 2016 earnings and that has been the case for all of the last year.<sup>180</sup>

231 Moreover, the 'sticky dividends' issue would only be material if future dividends were likely to fall so materially as to make the current dividend unsustainable, and there is no evidence to support that conjecture.

232 Finally, we note that there is no reason to suggest that this issue is any more or less important than at the time of the Guideline.

### ***Bias in analyst forecasts***

233 In its recent final decisions, the AER notes that any upward bias in analyst forecasts will result in a higher estimate of the required return on the market. The AER also notes<sup>181</sup> our previous submission that any such bias is irrelevant – if analyst forecasts are taken to be an estimate of the market's expectation of future dividends and the current price is taken to be an estimate of the market's expectation of the current value, it follows mechanically that the implied discount rate must be an estimate of the market's required return on equity. The AER's response on this point is that:

If analysts' dividend and price forecasts are biased, it is also plausible that the analysts' implied return on equity is biased.<sup>182</sup>

234 This response seems to miss the point. The AER seems to suggest that the market (proxied by analysts) should have forecasted lower dividends but maintained the same stock price, thus producing a lower implied return. But what we are seeking to estimate is the implied return that equates the dividend forecast that the market actually uses to the actual stock price – not the dividend forecast that the AER thinks the market should have used.

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<sup>177</sup> AusNet Draft Decision, Attachment 3, p. 206.

<sup>178</sup> <http://www.rba.gov.au/chart-pack/share-markets.html>.

<sup>179</sup> AusNet Draft Decision, Attachment 3, p. 62.

<sup>180</sup> <http://www.rba.gov.au/chart-pack/share-markets.html>.

<sup>181</sup> AusNet Draft Decision, Attachment 3, p. 62.

<sup>182</sup> AusNet Draft Decision, Attachment 3, p. 62.

235 Our previous submission also noted that any analyst forecast bias applied equally at the time of the Guideline, so would not be a reason for now placing less weight on the DGM estimates. The AER's response on this point is:

Frontier has not provided any evidence that bias has not increased.<sup>183</sup>

236 To examine the very recent extent of any analyst forecast bias in Australia, we collected data on 'earnings surprises' for the most recent financial year for the stocks in the ASX 20 index.<sup>184</sup> The earnings surprise is actual earnings per share less forecasted earnings per share, expressed as a percentage. Half of the firms had positive surprises and half had negative surprises and the mean surprise was 2.37%, meaning that actual earnings were slightly *above* the forecast. This high-level evidence is inconsistent with the proposition that forecast earnings are becoming more optimistic over time.

### ***Dividends as a proxy for free cash flow on equity***

237 In its recent final decisions, the AER cites a submission from McKenzie and Partington (2014) in relation to the effect of the financing of dividends.<sup>185</sup> McKenzie and Partington posit that if a firm routinely issues new shares,<sup>186</sup> that could affect the long-run dividend growth rate. However, this is already accounted for – the AER already makes a downward adjustment to the long-run growth rate for this effect.

238 Moreover, McKenzie and Partington (2014, p.29) conclude on this point that “it may be less of a problem at the level of the market” which is relevant when the DGM is being used to estimate the MRP.

239 Finally, we note that there is no reason to suggest that this issue is any more or less important than at the time of the Guideline.

### ***Term structure for required return on equity***

240 In its recent final decisions, the AER considers the question of a term structure in the required return on equity.<sup>187</sup> The idea is that rather than estimating a single required return on equity, one could assume that investors require a relatively higher return beyond Year 10 and a relatively lower required return before Year 10. The AER cites McKenzie and Partington (2014) on this point:

We do recommend that it be borne in mind that the existence of a term structure could materially change cost of equity estimates from the DGM.<sup>188</sup>

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<sup>183</sup> AusNet Draft Decision, Attachment 3, p. 206.

<sup>184</sup> Source: CommSec.

<sup>185</sup> AusNet Draft Decision, Attachment 3, p. 207.

<sup>186</sup> McKenzie and Partington provide a numerical example where a firm does this via a dividend reinvestment plan.

<sup>187</sup> AusNet Draft Decision, Attachment 3, p. 207.

<sup>188</sup> AusGrid Draft Decision, Attachment 3, p. 207.

241 Also relevant is what McKenzie and Partington (2014) said in the passage immediately before the quote selected by the AER:

Furthermore, even if we knew that there was a term structure, we would have the problem of estimating the cost of equity that was to apply to the more distant cash flows. It is a difficult enough problem estimating one cost of equity, without complicating that problem by requiring estimation of another cost of equity to apply at the end of the growth transition period. We therefore agree with SFG (2014d, p. 20) that if a term structure of equity was applied then:

*There is the risk that the regulated rate of return varies by substantial amounts over time because of estimation error, associated with whether a term structure exists and the assumption about the long term cost of equity.*

Consequently we do not recommend that an estimation technique involving an equity term structure be adopted.<sup>189</sup>

242 In its Guideline materials, the AER explained that:

...we do not incorporate a term structure into our model because it is non-standard.<sup>190</sup>

243 We note that it remains equally non-standard to impose an assumed term structure when implementing the DGM approach.

### **Summary and conclusions**

244 As set out above, we consider that the four points that the AER has raised in relation to the general reliability of DGM estimates of the MRP are overstated. To the extent that there are concerns about these points, those concerns would have to be weighed up against the strengths and weaknesses of other approaches. For example, the historical excess returns approach:

- a. Is an estimate that reflects the average conditions over the historical period, which may differ from the prevailing market conditions;
- b. Provides different estimates for different historical periods (especially the shorter periods that the AER considers);<sup>191</sup>
- c. Produces imprecise estimates with wide confidence intervals (especially the shorter periods that the AER considers).<sup>192</sup>

245 Our view is that the various approaches should be compared against each other in terms of their relative strengths and weaknesses. In our view, the historical excess returns approach and the DGM approach have different strengths and

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<sup>189</sup> McKenzie and Partington (2014), pp. 36-37.

<sup>190</sup> AER Rate of Return Guideline, Explanatory Statement, Appendices, p. 115.

<sup>191</sup> For example, the shortest period that the AER considers in its recent final decisions begins in 1988 and produces an estimate that is materially different from all other estimates. See AusNet Draft Decision, Attachment 3, Table 3-25, p. 198.

<sup>192</sup> For example, our estimate of the historical mean excess return since 1988 is 5.6% within a standard 95% confidence interval of 1.2% to 10.0%.

weaknesses, but they both have something to contribute and both should be afforded material weight. We note that the AER reached the same conclusion in its Guideline.

246 Importantly, none of the issues that the AER has raised in relation to the DGM have changed or intensified since the Guideline, so none of them provide a reason for reducing the weight that has been applied to the DGM approach. These points had already been raised at the time of the Guideline<sup>193</sup> and did not appear to raise alarm bells for the AER, which stated that:

The DGM method is a theoretically sound estimation method for the MRP. As DGM estimates incorporate prevailing market prices, they are more likely to reflect prevailing market conditions. DGM estimates are also clearly forward looking as they estimate expectations of future cash flows and equate them with current market prices through the discount rate.<sup>194</sup>

and:

...we consider DGM estimates have strong theoretical grounding and are more likely to reflect prevailing market conditions than other approaches.<sup>195</sup>

247 The AER went on to say that, regardless of the issues raised by Lally (2013) and McKenzie and Partington (2013), it had decided to give:

...significant consideration to DGM estimates of the MRP,<sup>196</sup>

and described its development of a preferred approach for implementing the DGM as:

...the most significant development in this area.<sup>197</sup>

248 McKenzie and Partington (2014, pp. 27) restate their concerns about slow-changing dividends (or 'sticky dividends' as they call it in that report) and potential analyst forecast bias and they recommend against using a term structure for DGM estimates. This report also includes a discussion of the SFG approach of simultaneously estimating the long-run dividend growth rate and required return on equity. However, that issue is not relevant to the AER's DGM specification.

249 Partington (2015) is an update of the McKenzie and Partington (2014) report. The section on DGM estimation is unchanged from the previous version.

250 Partington and Satchell (May 2015, p. 6) note that they have set out the same concerns about DGM estimates of the MRP in several prior reports and "Consequently we do not spend time recapitulating these points in the current report."

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<sup>193</sup> When setting out the four issues in Attachment 3 to the AusNet Draft Decision at Footnote 852, the AER cites Lally, M., 2013, *The DGM*, and McKenzie, M. and G. Partington, 2013, *The Dividend Growth Model*.

<sup>194</sup> AER (2013), Rate of Return Guideline: Explanatory Statement, Appendices, p. 84.

<sup>195</sup> AER (2013), Rate of Return Guideline: Explanatory Statement, Appendices, p. 85.

<sup>196</sup> AER Rate of Return Guideline, Explanatory Statement, p. 97.

<sup>197</sup> AER Rate of Return Guideline, Explanatory Statement, Appendices, p. 89.

251 Partington and Satchell (October 2015, pp. 43-44) again restate the concern  
about 'sticky dividends,' citing what was said on this point by Partington (2015)  
six months earlier.

252 We note that in its recent decisions, the AER states that:

We consider our dividend growth model is theoretically sound but that there  
are many limitations in practically implementing this model. We are not  
confident that the recent increases in estimates of the market risk premium  
from these models necessarily reflect an increase in the 'true' expected ten-  
year forward looking market risk premium.<sup>198</sup>

253 However, none of the issues that the AER raises relation to the DGM are new or  
different since the Guideline. Since the Guideline, the only thing that has  
changed in relation to the AER's DGM estimates is that they have become more  
and more inconsistent with the AER's allowed MRP of 6.5%. Of course, this  
alone is no reason to apply less weight to the DGM evidence and the AER has  
stated in its recent decisions that it has not departed from its Guideline approach  
to the MRP<sup>199</sup> and that:

We have not changed the weight we apply to the dividend growth model.<sup>200</sup>

254 Finally, we note that, for the reasons set out in our earlier report,<sup>201</sup> our view is  
that the DGM estimate should be computed without making a downward  
adjustment to the long-run GDP growth rate. The AER makes the deduction on  
the basis of US evidence that corporate earnings grow at a lower rate than GDP.  
However, the relevant academic articles use data that is more than 20 years out of  
date. In our earlier report, we show that corporate earnings have in fact *exceeded*  
GDP growth over the last three decades.<sup>202</sup> This led us to conclude that:

...it is not appropriate to attribute a low growth estimate to market expectations  
(on the basis of low growth observed decades ago), and then derive the cost of  
equity on the basis of current prices and earnings prospects.<sup>203</sup>

255 Thus, any downward adjustment to the assumed growth rate creates a downward  
bias in the DGM estimates. So even if there is some degree of upward bias  
resulting from the issues set out above, it would have to be offset against the  
downward bias that arises from the explicit downward adjustment that the AER  
makes to the GDP growth rate.

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<sup>198</sup> AusNet Draft Decision, Attachment 3, p. 59.

<sup>199</sup> AusNet Draft Decision, Attachment 3, p. 61.

<sup>200</sup> AusNet Draft Decision, Attachment 3, p. 207.

<sup>201</sup> SFG, 2014, *Alternative versions of the dividend discount model and the implied cost of equity*, May.

<sup>202</sup> SFG, 2014, *Alternative versions of the dividend discount model and the implied cost of equity*, May, p. 34.

<sup>203</sup> SFG, 2014, *Alternative versions of the dividend discount model and the implied cost of equity*, May.



### 7.3 The evolution of the AER's DGM estimates

256 We begin by noting that the DGM approach provides a direct estimate of the required return on the market and the AER's DGM estimates of the required market return have not changed since the Guideline, as set out in Figure 11 above. That is, the estimates have not changed or become extreme – they have remained remarkably stable since the Guideline.

257 The AER then takes its DGM estimates and disaggregates them to separate out an MRP estimate to be inserted into the SL-CAPM formula. This is not part of the DGM – this is how the AER uses the DGM in its foundational model approach. As far as the DGM goes, nothing has changed since the Guideline, which is consistent with the above evidence of stability in investors' required return on equity. In our view, the stability of the DGM estimates does not, in itself, support the notion that the DGM method has become less reliable over time and now warrants less weight.

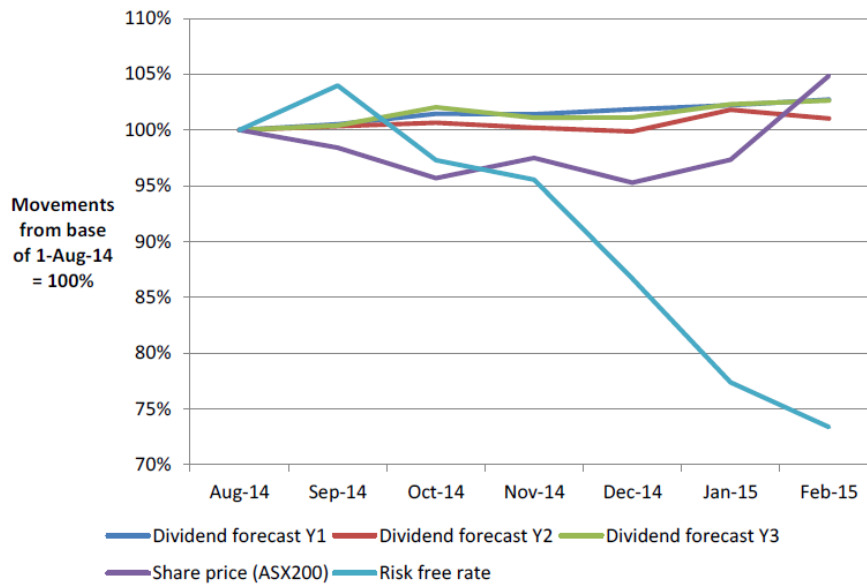
258 Figure 24 below sets out the AER's disaggregation of its DGM estimate of the MRP. It shows that, in the time since the Guideline forecasted dividends and share prices have both varied by less than 5%. That is, effectively nothing has changed since the Guideline. This is why the DGM estimate of the required return on the market has remained constant, even as government bond yields have fallen materially.

259 We note that this is all consistent with the external evidence set out above, which suggests that the required return on equity has remained constant even as government bond yields have declined.

260 By contrast, Figure 24 is inconsistent with the proposition that the required return on equity has declined one-for-one with the fall in government bond yields. Given that forecasted dividends are essentially constant, a material decline in the required return on equity must result in a material increase in the share price. This is because a lower discount rate would be applied to the same cash flows. However, Figure 24 shows that the share price has remained within 5% of the initial level even though government bond yields have plummeted.



Figure 24: AER decomposition of DGM estimates of the MRP



Source: Ausgrid Final Decision, Attachment 3, p. 3-361.

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That is, the AER's Figure 24 above is yet another piece of evidence to support the notion that the required return on equity has remained stable even as government bond yields have fallen. Importantly, this figure shows that nothing has changed materially other than the fall in the risk-free rate. The forecasted dividends have remained stable, share prices have remained stable, and the AER has maintained the same long-run growth rates. As we have shown above, this produces a stable estimate of the required return on equity. The only thing that has changed is that the yield on government bonds that the AER deducts from the estimate of the required return on the market.

## 8 A current estimate of the MRP

### 8.1 Instructions

262 In previous submissions, we have proposed that the MRP should be estimated by:

- a. Setting out all of the relevant evidence;
- b. Specifying the relative weight to be applied to each piece of evidence; and
- c. Explaining the reasons why different weight was applied to different pieces of evidence.

263 We remain of the view that this is the only way of showing how the MRP allowance was derived with the appropriate degree of transparency.

264 In this report, we have been asked to follow and update the approach set out in the AER's Guideline insofar as the approach in the Guideline was to:

- a. First form a combined range based on:
  - i. The AER's estimates of the mean historical excess return over various historical periods; and
  - ii. The AER's DGM estimates of the MRP; and
- b. To then select a point estimate that "lies between the historical average range and the range of estimates produced by the DGM."<sup>204</sup>

265 Specifically, we have been asked to:

- a. Update the historical excess returns range;
- b. Update the DGM range based on the AER's specification and parameter estimates;
- c. Construct the combined range as per the approach adopted in the Guideline; and
- d. Select a point estimate that we consider to be reasonable from within the combined range.

### 8.2 The range of mean historical excess returns

266 The historical excess returns range is set to 5.5% to 6.5% with a mid-point estimate of 6.0%, as per Figure 10 above.

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<sup>204</sup> AER Rate of Return Guideline, Explanatory Statement, p. 97.

### 8.3 The range of DGM estimates

267 The DGM estimate is set by using the AER's most recent DGM estimates of the required return on the market and subtracting the current 10-year government bond yield of 1.9%. The relevant estimates are set out in Table 6 below.

Table 6: Contemporaneous estimates of the MRP from the AER's DGM approach

Growth rate (%)	Two-stage model MRP (%)	Three-stage model MRP (%)
3.8	8.2	8.4
4.6	8.9	9.0
5.1	9.4	9.4

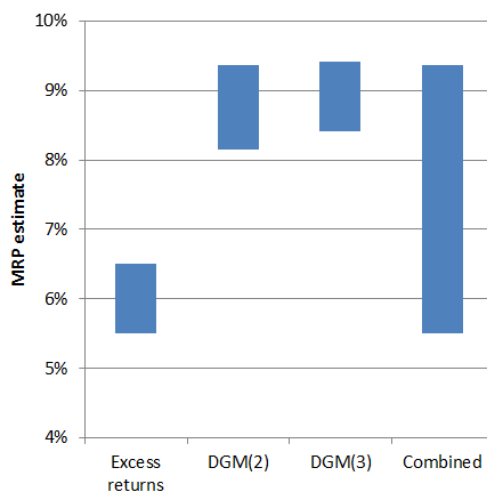
*Source: Estimates of the required return on the market are taken from Ausnet Services Draft Decision, Attachment 3, Table 3-26, p. 201 and estimates of the contemporaneous 10-year government bond yield are from the RBA.*

268 As set out above, the AER has stated a preference for the three-stage specification. We note that this specification, together with the AER's mid-point estimate of the growth rate, produces a current point estimate of 9.1%. However, we also note that, in the current market conditions, the AER's two-stage model produces estimates of the MRP that are not materially different from the three-stage model.

### 8.4 The combined range

269 The combined range, based on updated data as at the end of July 2016, is set out in Figure 25 below. The lower bound of the combined range is the 5.5% lower bound of the historical excess returns range and the upper bound of the combined range is the 9.4% upper bound from the AER's DGM approach. We note that the upper bound is currently the same for the AER's two-stage and three-stage DGM approaches.

Figure 25: Current MRP range – AER Guideline approach



Source: Frontier Economics calculations based on estimates set out in the AusNet Draft Decision, Attachment 3.

## 8.5 The selection of a point estimate from within the range

270 The second step of the AER's Guideline approach is to select a point estimate from within the combined range. In this regard, we note that the AER's Guideline approach is to select a point estimate where:

This point estimate lies between the historical average range and the range of estimates produced by the DGM. This reflects our consideration of the strengths and limitations of each source of evidence.<sup>205</sup>

271 In its Guideline, the AER adopted a point estimate MRP of 6.5%. The following factors appear to be relevant to the selection of that figure:

- The AER's historical excess returns mid-point estimate is 6.0%<sup>206</sup> and its mid-point three-stage DGM estimate is 7.1%.<sup>207</sup> The mid-point of these two estimates is 6.55%;
- The AER adopted an upper bound of 6.5% from its historical excess returns approach and a lower bound of 6.7% from its three-stage DGM approach. The mid-point of this gap between the two ranges is 6.6%;
- The AER's historical excess returns range and two-stage DGM range overlapped in the region of 6.1% to 6.5%. The mid-point of this region of overlap is 6.3%;

<sup>205</sup> AER Rate of Return Guideline, Explanatory Statement, p. 97.

<sup>206</sup> AER Rate of Return Guideline, Explanatory Statement, p. 93.

<sup>207</sup> The AER has subsequently stated its preference for the three-stage specification of the DGM. See, for example, JGN Draft Decision, Attachment 3, Appendix C, p. 222.

- d. The combined range adopted by the AER was 5.0% (the lower bound of the excess returns range) and 7.5% (the upper bound of the DGM range). The mid-point of the combined range is 6.3%; and
- e. If the historical excess returns range is based on arithmetic means, consistent with the AER's subsequent decisions, the combined range is 5.7%<sup>208</sup> to 7.5%, with a mid-point of 6.6%.

272 In summary, the approach to the MRP that is set out in the AER's Rate of Return Guideline is to rely primarily on the historical excess returns method and the DGM method (particularly the three-stage method) to specify a range for the MRP and to select a point estimate from within that range. Other evidence is considered to be "less informative"<sup>209</sup> and is given only "some"<sup>210</sup> or "limited"<sup>211</sup> consideration.

273 In relation to the current estimates set out above, we note that:

- a. The AER stated that its preferred historical excess returns estimate is 6.0%<sup>212</sup> and its mid-point three-stage DGM estimate was 9.0%.<sup>213</sup> The mid-point of these two estimates is 7.5%;
- b. The upper bound of the AER's historical excess returns approach is 6.5% and the lower bound from the AER's three-stage DGM approach is 8.4%. The mid-point of this gap between the two ranges is 7.5%;
- c. At the time of the Guideline, the AER's historical excess returns range and its two-stage DGM range overlapped. In the current market conditions, the upper bound of the historical excess returns range is 6.5% and the lower bound of the two-stage DGM range is 8.2%. The mid-point of the gap between these two ranges is 7.4%; and
- d. The combined range is from 5.5% (the lower bound of the excess returns range) and 9.4% (the upper bound of the DGM range<sup>214</sup>). The mid-point of the combined range is 7.5%.

274 In summary, we have identified the sorts of considerations that the AER applied when selecting its Guideline MRP of 6.5%. If we apply those same sorts of

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<sup>208</sup> AER Rate of Return Guideline, Explanatory Statement, p. 93.

<sup>209</sup> AER Rate of Return Guideline, Explanatory Statement, p. 96.

<sup>210</sup> AER Rate of Return Guideline, Explanatory Statement, p. 97.

<sup>211</sup> AER Rate of Return Guideline, Explanatory Statement, p. 97.

<sup>212</sup> AER Rate of Return Guideline, Explanatory Statement, p. 97.

<sup>213</sup> The AER has subsequently stated its preference for the three-stage specification of the DGM. See, for example, JGN Draft Decision, Attachment 3, Appendix C, p. 222.

<sup>214</sup> Note that the upper bound is currently the same for the AER's two-stage and three-stage DGM approaches.

considerations to the current evidence that the AER has compiled, the result is an estimate of 7.5%.

275 If the MRP is set to 7.5%, the implied market return is 9.4%<sup>215</sup> which is still more than 10% below the 10.5%<sup>216</sup> allowed market return at the time of the Guideline. That is, setting the current MRP to 7.5% implies that the required return on equity has reduced materially since the Guideline, but less than one-for-one with the fall in the risk-free rate.

276 An allowed MRP of 7.5% is an outcome that lies between:

- a. The view that the MRP is constant over all market conditions such that the required return on equity rises and falls one-for-one with changes in the risk-free rate; and
- b. The view that the required return on equity has remained stable over the period since the Guideline.

277 In our view, this is a very conservative estimate in light of the weight of evidence set out above – which supports the notion that the required return on equity has not declined materially since the Guideline.

278 Since the Guideline:

- a. The AER's own DGM estimates indicate that the MRP has increased materially;
- b. The AER's own DGM estimates indicate that the overall required return on equity has remained stable; and
- c. There is substantial other evidence, as set out in Section 5 above, that the overall required return on equity has remained stable.

279 In persisting with a 6.5% MRP (such that its allowed return on equity has been reduced by more than 25% since the Guideline) the AER is apparently applying no weight to any of this evidence. In particular, as the AER's own DGM estimates of the required return on equity have remained stable, it has afforded that evidence progressively less weight – reducing the allowed return by more than 25%. As the AER's own evidence has become more and more inconsistent with its proposed regulatory allowances, that evidence has been progressively disregarded. In our view, that approach is unreasonable – the AER's approach of setting the allowed return on equity by adding a fixed premium to the contemporaneous government bond yield is based on assumption rather than evidence.

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<sup>215</sup> 1.9% + 7.5%.

<sup>216</sup> 4.0% + 6.5% = 10.5%.

## 8.6 An appropriate forward-looking estimate that is commensurate with the prevailing conditions in the market for equity funds

280 In the previous subsection, we have identified the sorts of considerations that the AER applied when selecting its Guideline MRP of 6.5% and applied those same sorts of considerations to the current evidence that the AER has compiled, producing an MRP estimate of 7.5%. We noted that estimate implies a market cost of equity that is more than 10% below the allowance provided under the Guideline at the time of its publication.

281 In this section of the report, we have been asked to consider whether that 7.5% estimate is supported by all of the current evidence that we consider to be relevant.

282 In doing this, our approach is to make a number of changes to the approach adopted in the previous subsection in order to incorporate all of the evidence that we consider to be relevant to informing the estimate of the MRP.

283 Specifically, in determining whether the 7.5% MRP estimate is an appropriate forward-looking estimate commensurate with the prevailing conditions in the market for equity funds:

- a. Our approach is to adopt a theta of 0.35, commensurate with a gamma of 0.25, when estimating the MRP;
- b. Our approach is to place no weight on the geometric means of historical excess returns because they do not provide an appropriate estimate of the expected return for the purpose of estimating the MRP. This contrasts with the AER's Guideline approach which was to set the lower bound of its primary range for MRP at 20 basis points above the highest geometric mean estimate<sup>217</sup> and the AER's current approach which is to base its range for historical return estimates on arithmetic averages;<sup>218</sup>
- c. Our approach is to place no weight on historical excess return estimates that use periods that begin in the 1980s because the estimates from such short periods are so imprecise as to be statistically uninformative. This contrasts with the AER's approach, which is to make no distinction between historical excess returns estimates based on their statistical precision or the width of the relevant confidence intervals;
- d. Our approach is to apply the NERA adjustment to better match the dividends paid in the early part of the historical sample – for

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<sup>217</sup> AER Rate of Return Guideline, Explanatory Statement, p. 93.

<sup>218</sup> AusNet Draft Decision, Attachment 3, p. 59.

the reasons set out in our earlier report<sup>219</sup> and because those corrected estimates have now been adopted by commercial data vendors.<sup>220</sup>

- e. Our approach is to have regard to the Wright approach as an estimate of the MRP, consistent with the way it is used by other regulators, rather than as a return on equity cross-check – for the reasons set out in our earlier report.<sup>221</sup>
- f. We consider that the historical excess returns and Wright estimates represent two end points of a spectrum. The historical returns approach assumes that the risk premium is constant and that required returns rise and fall one-for-one with changes in the government bond yield. The Wright approach assumes that the required real return is constant and that rises and falls in the government bond yield are offset by falls and rises in the risk premium. Since the truth is likely to lie between these two end points, we would assign material weight to both.
- g. The historical mean return estimates, with the NERA correction and with theta set to 0.35, are set out in Table 7 below. We note that the most precise estimate is 6.5% from the longest available period and that the estimate from 1958 (when data quality improved) is 6.3%. We consider that this evidence conservatively supports an MRP of at least 6.2%, which (with a current government bond yield of 1.9%) implies a required return on the market of only 8.1%.

Table 7: Historical excess return estimates: NERA correction, Theta set to 0.35.

Period	Mean	Standard error
1883-2015	6.5%	1.4%
1937-2015	5.8%	2.2%
1958-2015	6.3%	2.9%

Source: Frontier calculations.

- h. The Wright estimate of the required return on the market is 11.2% without the NERA correction and 11.6% with the NERA correction – in both cases based on a theta of 0.35. With a current government bond yield of 1.9%, the Wright approach produces MRP estimates of 9.3% to 9.7%.

<sup>219</sup> SFG, 2014, The required return on equity for regulated gas and electricity network businesses, June, pp. 49-52.

<sup>220</sup> Credit Suisse Global Investment Returns Sourcebook.

<sup>221</sup> SFG, 2015, The required return on equity for the benchmark efficient entity, February, p. 29 and following.



- i. As set out above, our view is that the historical data supports an estimate somewhere between the excess return and Wright end points on the spectrum. The mid-point between the 6.2% historical excess returns estimate and the 9.7% Wright estimate is 7.95%. Even if we apply twice as much weight to the historical excess returns estimate, the resulting point estimate is 7.4%. Consequently, we conclude that the 7.5% estimate is supported by the historical data.
- j. For the reasons set out in our earlier report,<sup>222</sup> our view is that the DGM estimate should be computed without making a downward adjustment to the long-run GDP growth rate. We also agree with the AER in preferring the three-stage model. Updated results using a theta of 0.35 are set out in Table 8 below. Our preferred estimate is the three-stage estimate with no deduction to GDP growth of 8.9%, implying a required return on the market of 10.8%. We conclude that an estimate of at least 7.5% is supported by the evidence in the table below.

Table 8: DGM estimates: Theta set to 0.35.

Growth rate	Two-stage	Three-stage
3.8%	7.2%	7.5%
4.6%	7.9%	8.1%
5.1%	8.4%	8.5%
5.6%	8.9%	8.9%

Source: Frontier calculations. Data to end July 2016

- k. We note that an MRP estimate of 7.5% implies that the required return on equity across the market has fallen by more than 10% since the Guideline. For the reasons set out in Sections 4 and 5 above, we consider this to be a conservative estimate. For example, we consider that:
  - i. Recent independent expert reports support an MRP of 7.5%;
  - ii. Recent Australian regulatory determinations support an MRP of 7.5%; and
  - iii. The range of evidence set out in Section 5 supports an MRP of 7.5% in that it is inconsistent with a material decline in the cost of equity capital.

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<sup>222</sup> SFG, 2014, Alternative versions of the dividend discount model and the implied cost of equity, May.

284 For all of the reasons set out above, we conclude that the current evidence supports an MRP estimate of at least 7.5%. This conclusion, and the above calculations that support it, are based on a theta set to 0.35.

## 8.7 Adjustments under the AER approach for a change in theta

285 The last issue that we have been asked to consider is the extent to which a change in theta from 0.6 to 0.35 would affect the MRP as estimated in the AER's most recent decisions.

286 As we have noted above, the AER's current approach appears to apply negligible weight to its own DGM estimates. The DGM estimates have increased materially since the Guideline and are now materially inconsistent with the 6.5% MRP allowance that has remained constant since the Guideline. Rather, the AER now appears to rely almost exclusively on the AER's historical excess returns estimates.

287 As we have noted above, the short-run historical excess returns estimates that use data that begins in the 1980s are very imprecise, having relatively high standard errors and confidence intervals that include both 0% and 10%. That is, they are statistically uninformative, which is why we focus on the long-run estimates as in Table 7 above. Those three long-run estimates fall by an average of 15 basis points if theta is changed from 0.6 to 0.35. The estimate based on the full data set falls by only 9 basis points. These changes are insignificant relative to the variation across the estimates that the AER has set out in its recent decisions. For example:

- a. The AER's arithmetic mean historical excess returns estimates vary by 100 basis points;<sup>223</sup>
- b. The AER's three-stage DGM estimates vary by 100 basis points;<sup>224</sup>
- c. The AER's two-stage DGM estimates vary by 122 basis points;<sup>225</sup>
- d. The difference between the AER's maximum arithmetic mean estimate and minimum DGM estimate is 128 basis points;<sup>226</sup> and
- e. The width of the standard 95% confidence intervals for the historical excess returns estimates are all more than 250 basis points.

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<sup>223</sup> AusNet Draft Decision, Attachment 3, pp. 191-192.

<sup>224</sup> AusNet Draft Decision, Attachment 3, p. 201.

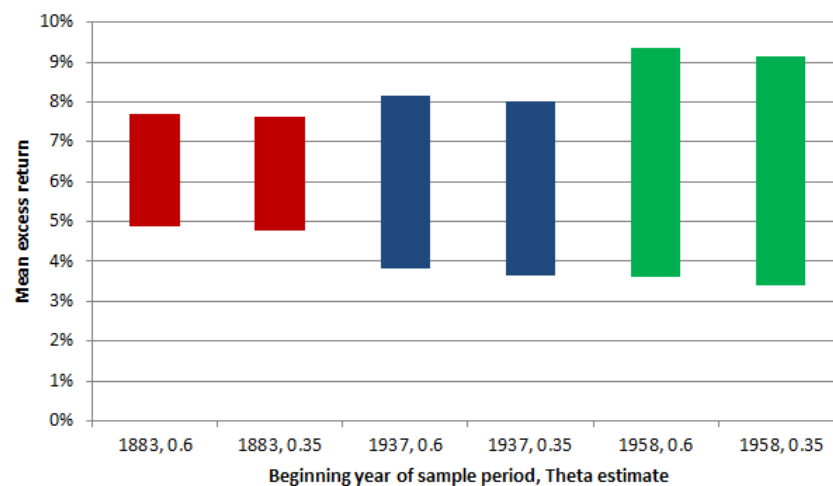
<sup>225</sup> AusNet Draft Decision, Attachment 3, p. 201.

<sup>226</sup> AusNet Draft Decision, Attachment 3, pp. 191-192 and p. 201.

288 In summary, when determining whether, and if so to what extent, a change in the  
estimate of theta would impact the estimate of the MRP, it is necessary to  
consider the evidence on which the estimate of MRP was based. In its recent  
decisions, the AER appears to have based its estimate of the MRP almost  
exclusively on the historical excess returns evidence. The fact that these  
estimates are relatively insensitive to the estimate of theta indicates that a change  
in theta would have a commensurately small impact, if any, on the MRP that is  
selected.

289 To demonstrate this, Figure 26 below shows the standard 95% confidence  
intervals for mean historical excess returns estimated over various different  
sample periods and for different estimates of theta. The figure shows that the  
change in the estimate of theta is very small, relative to the estimation uncertainty  
in each case. The discretion and judgment that is applied in distilling the  
evidence down to a single MRP allowance is orders of magnitude greater than the  
effect of changing theta.


Figure 26: Historical excess return estimates for different estimates of theta



Source: Frontier calculations.

## 9 Declaration

290 I confirm that I have *made all the inquiries that I believe are desirable and appropriate and no matters of significance that I regard as relevant have, to my knowledge, been withheld from the Court.*



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Professor Stephen Gray



## Equities



## AUSTRALIA

DUE AU Neutral

Price (at CLOSE#, 19 Feb 2016) A\$2.35

Valuation A\$ 2.34

- DCF (WACC 7.5%, beta 0.8, ERP 5.0%, RFR 3.8%)

12-month target A\$ 2.31

12-month TSR % +6.0

Volatility Index Low

GICS sector Utilities

Market cap A\$m 5,454

30-day avg turnover A\$m 13.6

Number shares on issue m 2,321

## Investment fundamentals

Year end 30 Jun	2015A	2016E	2017E	2018E
Revenue	m 1,238.0	1,707.0	1,716.4	1,784.1
EBIT	m 498.4	611.0	593.3	632.9
Reported profit	m 48.1	168.1	179.1	206.7
Adjusted profit	m 48.1	168.1	179.1	206.7
Gross cashflow	m 322.5	463.3	454.7	486.7
CFPS	¢ 21.2	22.3	19.6	21.0
CFPS growth	% -40.2	4.9	-12.0	7.0
PGCFPS	x 11.1	10.6	12.0	11.2
PGCFPS rel	x 1.31	1.15	1.48	1.48
EPS adj	¢ 3.1	8.1	7.7	8.9
EPS adj growth	% -79.2	161.7	-4.5	15.4
PER adj	x 76.1	29.1	30.5	26.4
PER rel	x 5.14	1.85	2.17	2.03
Total DPS	¢ 16.8	18.0	18.5	19.0
Total div yield	% 7.1	7.7	7.9	8.1
Franking	% 0	0	0	0
ROA	% 5.6	6.0	5.2	5.6
ROE	% 2.8	6.5	5.7	7.5
EV/EBITDA	x 12.1	11.5	11.5	11.0
Net debt/equity	% 268.3	163.7	188.5	221.4
P/BV	x 2.0	1.6	1.8	2.1

## DUE AU vs ASX 100, &amp; rec history



Note: Recommendation timeline - if not a continuous line, then there was no Macquarie coverage at the time or there was an embargo period.

Source: FactSet, Macquarie Research, February 2016

(all figures in AUD unless noted)

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19 February 2016

Macquarie Securities (Australia) Limited

## DUET Group

## EDL lower but core business strong

## Event

- DUE reported 1H16 results with PP EBITDA of \$455m (ex one offs), 2.3% below our expectation of \$466m. Op Cash post maintenance capex on a PP bias was \$239m ie \$0.103ps (MRE \$312m), well above last year at \$90m. One off costs dragged down cashflow, but still covered the dividend of \$0.09, with management reiterating FY16 guidance of 18c and long term growth of \$0.005pa in FY17 and FY18.

## Impact

- The stable growth businesses of DBP, UED and MGH performed above expectations with solid cost discipline coming through, albeit some is timing. Whilst positive, both UED and DBP are impacted by a regulatory reset in 2H16 which will create some earnings pressure, albeit fully anticipated and partially mitigated by falling funding costs.
- EDL was disappointing against expectations but still up 12% against pcg. Lower production in the UK, reset and loss of contract in remote, and lower sales prices for electricity saw below expectation results in remote and clean energy. However much is timing with Qld power prices structurally increasing and REC continuing to grow, thus providing a base for higher earnings. Added to this, EDL sits on ~36MW of surplus capacity. 21MW is to still be formally committed to Anglo, which will help reduce concern over the negative resource impact; the residual 15MW potentially funds an opportunity in the NT, and there is scope to expand this further. These are the growth avenues EDL have consistently developed and DUE are progressing. Confirmation of the growth reduces risk for DUE.
- Cash generation was sound at the asset level. Net of capital contributions net hold co cashflow was \$127m compared to a dividend declared of \$209m. The difference is UED capital contribution which was pre funded of \$82m. Underlying cashflow of 10.3¢ covered the dividend and is expected to strengthen in the coming years as EDL growth is confirmed.

## Earnings and target price revision

- FY16/FY17/FY18 EBITDA changes by -11.7%/-1%/-1.3%, eps by 22.7%/-9.1%/-6.6%, and TP by -7.6% to A\$2.31.

## Price catalyst

- 12-month price target: A\$2.31 based on a DCF methodology.
- Catalyst: UED final regulatory reset April 16

## Action and recommendation

- We have revised our price target to \$2.31 reflecting the forward valuation. The growth driver remains EDL however these programs are lumpy with timing hard to predict. At this stage we have captured the Anglo expansion with upside to our expectation with NT opportunity. At the same time DUE does have some balance sheet flexibility to pursue growth and the proposed dividend path. The high yield provides a base value, but we doubt investors will pay for growth ahead of it being committed. We have lowered our recommendation to Neutral.

Fig 1 The good the bad and interesting-

What we liked	What was of concern	Interesting
<p><b>Core DUE business strong.</b> While EDL contribution was below expectation, core EBITDA of existing DUE was slightly ahead of our expectation with growth of 19.6% to \$347m (PP) vs. MRE of \$341m. With revenue growth from existing DUE businesses broadly in line with our expectation, the growth reflects an element of better cost performance across the group with EBITDA margin ex EDL of 73.8%, albeit some of this lower cost is simply timing.</p> <p><b>Reiterated DPS guidance.</b> 1H16 dps of 9cps was in line with expectation, with DUE reiterating guidance for FY16 DPS of 18cps (2H16: 9c) as well as FY17 +2.8% to 18.5c and FY18 +2.7% to 19c. FY16 guidance is expected to be 110% cash covered. 1H16 distributions from EDL were \$62.6m vs. earnings from PP consolidation of \$67.5 thus ~93% of earnings. Expectation is for this to continue to average 90-95% payout.</p> <p><b>DBP remains steady.</b> Revenue throughput was down 1.8% albeit, transmission revenue increased 1.8% reflecting high fixed component with ~80% take or pay contracts and tariff increase. EBITDA was strong at \$130.2m (PP), growth of 4.8% and above our expectation of \$124m. The variance came from lower fuel gas charges which were ~13.4% lower than pcp and \$5.6m (PP) below our expectation along with some customer connection revenue. With DBP reflecting ~28% of 1H16 PP EBITDA, it is encouraging to see the major asset in the portfolio is performing steadily</p> <p><b>UED EBITDA stronger.</b> UED delivered the strongest 1H16 EBITDA growth on a PP basis with EBITDA of \$132.5m +26.2% on pcp and ~\$14m above our expectation of \$118m. While the growth was strong and partly reflects the impact of a hotter summer months and increasing connections through back end of 2H15, the variance reflects lower opex costs (~\$6m PP) which were down 8.7% (PP). While this is a positive, the lower opex is largely timing based, which should see a reversal through 2H16.</p> <p><b>MGH.</b> Overall throughput was up +6.2% to 32,073TJ driven by impact of cooler winter. Distribution revenue growth was slightly lower at 6.0% reflecting impact of tiered tariff structure. Opex was up 8.9% reflecting increasing employee costs and \$1.2m non cash provision for unaccounted for gas.</p> <p>Overall EBITDA was up \$73.1m, growth of +9.7%, stronger than distribution revenue, reflecting impact of \$7.7m contribution from other revenue (Chargeable works, Metering revenue).</p> <p>MGH also received approval for accelerated pipe works replacement pass through which will see tariffs increase an additional 1.4% in CY16 and CY17.</p> <p><b>Core Op cashflow above expectation.</b> While consolidated operating cashflow was \$209m, well below our expectation of \$356m at an asset level, with the exception of EDL, operating cashflow looked better than expected. Thus the key difference reflects acquisition costs around EDL and slightly higher tax paid.</p> <p><b>DDG above expectation.</b> 1H16 was the first full half year of contribution from DDG. EBITDA (PP) was \$16m vs MRE of \$13m thus 20% above expectation. Albeit, EBITDA margin was slightly lower at 87% vs MRE of 89% with key difference being higher opex than anticipated, albeit in context of total opex spend of \$2.4m in DDG the group impact is small. DUE also highlighted a number of growth opportunities including expansion of Fortescue River Gas Pipeline (FRGP).</p> <p>Source: Macquarie Research, February 2016</p>	<p><b>EDL weaker across the board.</b></p> <p>Key driver of earnings variance vs. expectation was from EDL. EBITDA was \$108.1m vs. MRE of \$124.7m, thus 15.3% lower. The variance was loss of contract in remote generation (\$3m) and end of the APLNG leasing revenue (-\$3m).</p> <p>In Clean Energy volume was down 0.8%, but the major difference was realised price for the market facing volume. At this stage hedging is limited and average price in 1H16 was actually \$5/MWh lower than pcp, and \$15/MWh lower than expectation.</p> <p>The US and UK businesses were also \$4m better than expectation, partially reflecting currency difference, the major change was 10% decline in generation in the UK along with the loss of LEC's.</p> <p><b>Some concern around counterparty risk building.</b> DUE's exposure to the broader resources e.g. iron ore producers, smaller commodity producers does create some credit fear. Management highlighted much of the contracting is at the asset level, not company, thus in the event of failure, DUE should be ok.</p> <p>Issue is the outlook is tough; we think there is risk coal mine development by the likes of Anglo is delayed, thus delaying the need for more generation capacity.</p>	<p><b>EDL – Green performed as expected.</b> Despite the weak overall performance Green Revenue was as expected at ~\$50m, up 36% on pcp. EDL already had a partial hedging program prior to DUE acquisition with older hedges in place not being leveraged to the recent rally. EDL also highlighted the market is very thin for REC's thus the spot price is not necessarily representative of the realised price. Notwithstanding this commentary, AGL and ORG are signalling that the pricing is sustainable, so we expect hedging over time will catch up.</p> <p>It is worth noting EDL has only 4 more years of material REC revenue unless the coal waste schemes are extended.</p> <p><b>2016 regulatory resets.</b> 2016 remains a key year for DUE with the reg resets of UED (Apr-16), and DBP (revised proposal – Feb 22<sup>nd</sup>) underway. Interesting element is NSW appeals process which remains ongoing. Key talking points which UED have highlighted in their proposal are around adoption of a trailing average cost of debt and gamma (valuation of tax credits).</p> <p>UED has submitted its revised proposal which with the final due in April will set tariffs for CY17-CY20. With a price path of CPI+15% for 3 years proposed, we anticipate it will get quickly rejected by the regulator. It also highlights the challenge distributors are creating, as such pricing increases improve the economics of batteries and solar such that grid usage falls further.</p> <p><b>Maintenance SIB capex.</b> SIB Capex increased \$19m, albeit the increase largely reflects \$20.4m impact from EDL, which itself was \$2.7m better than expectation (MRE: \$23.1m). Ex EDL SIB capex reduced \$1.5m vs. our expectation of a \$1m increase. The difference was lower SIB capex in MGH and UED. Thus overall performance was strong which if sustained will continue to underpin stronger cashflow growth.</p> <p><b>B/S sound following \$1.4b debt raised in 1H16.</b> The last 6 months have been a transitional period for DUE, largely driven by acquisition of EDL. Group gearing is now 61% down from 72% post capital raising of \$1.67b in 2015.</p> <p><b>Recontracting at a number of sites.</b> DUE highlighted successful recontracting of a number of customers in 1H16 for EDL. 1H16 contracted revenues represented ~89%. Commentary was that there was an element of discounting in negotiations albeit across the board pricing has been pleasing. Key contracts include 97MW Appin Tower contract with South32 (18y) which represents more than 10% of EDL capacity and GSA with Anglo American (23y) and Oaky creek (11y) which increase weighted average tenor from 13 to 20y. Despite Anglo assets being put up for sale, limited impact for DUE in a change of ownership scenario under current contract. .</p> <p><b>NT opportunity.</b> DUE highlighted they are currently in a competitive bidding process for a gas fired 90MW new generation for Power and Water Corporation which supplies electricity generation and retail services. The contract is expected to be a 15y PPA agreement which is in line with DUE's contract profile.</p>

## Analysis

- Below we outline key variances with DUE's 1H16 result vs. expectation.

**Fig 2 DUET Group Consolidated Accounts vs expectation (update)**

P&L (Consolidated)		2014	Dec-14	Jun-15	2015	Dec-15	Growth	1H16E	Variance	Jun-16	2016	2017
<b>Revenue</b>							%	MRE	%			
Dampier Bunbury Pipeline (80%)	A\$m	429	194	203	397	200	3%	198	1%	188	388	370
United Energy (66%)	A\$m	600	307	338	645	340	11%	331	3%	300	634	618
Multinet (100%)	A\$m	182	99	85	184	107	9%	121	(11%)	88	196	216
Energy Deevlopments	A\$m	0	0	0	0	217		243	(11%)	231	448	476
Other/DBPS	A\$m	41	17	27	44	-67	(497%)	15	(552%)	17	-50	34
<b>Total Revenue</b>	<b>A\$m</b>	<b>1,251</b>	<b>616</b>	<b>653</b>	<b>1,269</b>	<b>797</b>	<b>29%</b>	<b>908</b>	<b>(12%)</b>	<b>825</b>	<b>1,616</b>	<b>1,715</b>
<b>EBITDA</b>												
Dampier Bunbury Pipeline (80%)	A\$m	349	153	161	314	161	5%	153	5%	150	311	284
United Energy (66%)	A\$m	333	159	201	360	201	26%	179	12%	138	332	279
Multinet (100%)	A\$m	123	66	56	122	73	10%	92	(20%)	58	131	151
Energy Deevlopments	A\$m	0	0	0	0	108		125	(13%)	122	185	245
Other/DBPS	A\$m	-9	-10	-11	-22	-49	366%	7	(804%)	7	-41	16
<b>EBITDA</b>	<b>A\$m</b>	<b>796</b>	<b>368</b>	<b>407</b>	<b>775</b>	<b>494</b>	<b>34%</b>	<b>555</b>	<b>(11%)</b>	<b>475</b>	<b>917</b>	<b>975</b>
D&A	A\$m	-266	-135	-141	-277	-165	22%	-189	(12%)	-192	-357	-382
Net Finance Costs	A\$m	-429	-237	-197	-433	-208	(12%)	-196	6%	-163	-371	-328
Tax Expense	A\$m	91	-7	-12	-19	-12	70%	-41	(70%)	-40	-52	-85
Minorities	A\$m	-3	10	-8	2	-19		-4	409%	-1	-20	-1
<b>NPAT</b>	<b>A\$m</b>	<b>190</b>	<b>-1</b>	<b>49</b>	<b>48</b>	<b>89</b>		<b>126</b>	<b>(29%)</b>	<b>79</b>	<b>117</b>	<b>179</b>
Underlying EPS	cps	15.2	-0.1	3.3	3.2	3.9		5.4	(29%)	3.4	7.2	7.7
DPS	cps	17.0	8.8	8.8	17.5	9.0	3%	9.0	-%	9.0	18.0	18.5
Capex	A\$m	-375	-438	54	-385	-1,454	232%	-1,685	<b>(14%)</b>	-129	-1,583	-283

Source: Company data, Macquarie Research, February 2016

- 1H16 marked the first period of contribution from ENE post acquisition, thus the result was somewhat messy with consolidated core revenue growth of +29% to \$797m (ex interest inc) and EBITDA growth was +34% to \$494m. There was a one off acquisition cost associated with EDL, thus underlying is closer to \$538m. Consolidated NPAT was \$89m vs expectation of \$126m, adjusted for the one off tax effected NPAT was \$120m. Broadly the key difference to our expectation was lower contribution from ENE.

### Across the divisions

- DBP.** Delivered EBITDA of \$160m, up 4.8% from \$153m in pcp and above MRE of \$153m. Throughput declined 1.8%, albeit transmission revenue was in line with expectation, up 2.8%, reflecting impact of fixed contracts. Key driver of the difference was lower fuel costs associated with lower throughput/utilisation, which was \$9m vs. MRE \$16m. Cash interest expense stepped down \$20m as expected.
- Whilst there is some step down in volumes through contract relinquishment, the interesting element is the growing back haul. This reduces fuel cost, which should also benefit 2H16. Otherwise 2H16 will see step down in EBITDA as the 15% of contracted volume roles on to the regulated tariff. Whether there is a further step down will depend on appeals by ATCO and the NSW regulators thus the potential is for a decision to be delayed beyond June.
- UED.** Total Revenue growth was +14.3% to \$275.6m vs. MRE \$264m. Key driver of the growth was strong contribution from Metering which was up \$8m vs. expectation. EBITDA was \$200.7m vs. expectation of \$179m, with opex ~\$8.5m below expectation. Albeit, the opex reduction is simply timing impact, thus will reverse through 2H16.
- The new regulatory framework starts in draft as of 2H16, with material price declines. This is both for regulated DOUS and the Meter services. The impact is ~\$35m step down in revenue. Part of this decline is the debt swaps also resetting, with 220bps of savings ie ~\$22m in 2H16. Thus the net drag from the reset is ~\$13m in 2H16, with a full year effect in FY17. Again this is subject to a final decision by the regulator, albeit we doubt UED application will be accepted (45% real growth over three years).



Fig 3 UED (Incl Metering) Draft determination 2016-2020

UED (incl Metering) 2016-20120 Determination					
UED (incl Metering)		Proposal	Preliminary Decision	Revised Proposal	MRE
WACC	%	7.4%	6.1%	8.7%	6.4%
Revenue	\$m	2,520	2,114	2,798	2,288
Opex	\$m	892	829	887	876
Reg Depreciation	\$m	495	425	576	496
Tax	\$m	149	86	190	82
Total Revenue	\$m	2,520	2,114	2,798	2,288
Capex	\$m	1,243	909	1,167	1,102
RAB end	\$m	3,023	2,749	2,869	2,990

UED		Proposal	Preliminary Decision	Revised Proposal	MRE
Opex	\$m	863	711	830	758
Capex	\$m	1,218	895	1,152	1,087
Revenue	\$m	2,315	1,832	2,551	2,008
Reg dep	\$m	388	315	463	378
Tax	\$m	149	85	184	82
WACC	%	7.4%	6.12%	8.70%	6.37%
RAB close	\$m	2,900	2,631	2,753	2,869

Metering		Proposal	Preliminary Decision	Revised Proposal	MRE
Opex	\$m	29	118	57	118
Capex	\$m	25	15	15	15
Revenue	\$m	205	282	247	280
Reg dep	\$m	107	110	112	118
Tax	\$m	-	2	6	-
WACC	%		6.12%	8.70%	6.37%
RAB close	\$m	123	118	116	120

Source: AER, Macquarie Research, February 2016

- **MG.** Distribution revenue growth of 6% was above tariff growth of 3.8%, reflecting strong throughput of 6.2% driven by impact of cooler weather illustrated by +7.2% tariff V volume. Key driver of EBITDA growth of \$6.5m was additional \$3.7m contribution from chargeable works. Costs were higher despite the one offs impacting last year. The increase reflects some in sourcing like call centres. The outlook is relatively strong as the additional price path from additional capex spend has been accepted.
- **DDG.** EBITDA was in line with expectation at \$13m vs MRE \$13.2m. However there was a one off cost associated with the NT pipeline bid, thus underlying was closer to \$15.7m, with better revenue coming from projects compared to our expectations. The business continues to have opportunities around miners seeking to lower costs, and there is some co-ordination with EDL.
- **EDL.** Was key driver of earnings variance for DUE vs. MRE. Total Revenue was \$216.6m vs. MRE of \$243m (\$26.4m difference) while EBITDA of \$108.1m was \$16.6m below MRE of \$124.7m. Key driver of lower revenue was lower generation across Australia Remote (-1.2%) and Clean (-0.8%) with these two businesses accounting for \$13m of the ~\$16m difference.
  - ⇒ **Clean Energy.** EBITDA \$7m below expectation with lower production than forecast, along with a weaker pricing environment in black energy. The latter reflects some contract repricing at the likes of Tower/Appin, but simply an average price in Qld that was lower than pcp by \$5/MWH, we had expected to increase. Renewable performance based on \$50m revenue for the group was in line with expectations.
  - ⇒ The outlook for Clean energy is the formal commitment to 21MW of development at Anglo. There is no additional cost for the equipment that was used at APLNG site up until December 2015. EDL has another 15MW of surplus capacity that it needs to install. Otherwise the major recontracting has now been completed, thus EDL has a high degree of earnings certainty, barring commodity price movements.

- ⇒ **Remote Energy.** EBITDA \$6m below expectation. This is a little disappointing, possibly reflecting an earlier timing of the Clark Energy contract to APLNG coming to an end (-\$3m), loss of the mid-west town volume (known) and some repricing with existing gold customers during the middle of the year.
- ⇒ The surprise was EDL indicated they are bidding for up to 90MW of generation capacity to increase power stability in NT. This should be known in the coming months. EDL's advantage is its ability to install relatively quick as it has 15 MW of capacity available immediately. In addition EDL is in discussion with Pine Creek to extend its contracts and provide additional services. Both initiatives could see an extension of the average life beyond 8.8 years.
- ⇒ **UK.** UK was ~\$4m below expectation reflect currency difference, but also weak power generation during the period. This reflects one of the larger landfills having production issues as there was re-organisation of the site by the landfill manager, thus volumes should normalise, and earnings rebound in 2H16 and FY17.

## Cashflow

- Operating cashflow (consolidated) was \$221m, well below our expectation of \$356m with an adverse \$90m working capital movement. Underlying asset cashflow was good, with DBP up \$22m on lower funding costs and DDG +\$13m as a result of full year contribution from Fortescue and Ashburton West. UED was up \$66m to \$119m with a strong improvement in working capital. This should continue in 2H15 with cash interest and WC improving. The only softer element was working capital at MGH, down \$10m. EDL capex was up by \$10m, however this captures one off charges associated with the transaction, underlying is closer to \$100m, nearly double pcg as the benefits of lower tax paid come through.

**Fig 4 DUET Group Consolidated CF vs expectation**

Cashflow (consolidated)		2014	Dec-14	Jun-15	2015	Dec-15	Growth	Dec-15	Variance	Jun-16	2016	2017
<b>Operating Cash Flow</b>												
EBITDA	\$m	796	368	407	775	494	34%	555	(11%)	475	968	975
Net Interest Paid	\$m	-424	-205	-176	-381	-175	(15%)	-192	(9%)	-156	-349	-317
Tax Paid	\$m	0	-2	0	-2	-8	343%	-19	(59%)	0	-4	-8
Other (dec Working Capital)	\$m	22	-15	-15	-30	-90	511%	35	(355%)	-25	-132	-26
<b>Net Operating Cashflow</b>	<b>\$m</b>	<b>394</b>	<b>147</b>	<b>217</b>	<b>363</b>	<b>221</b>	<b>51%</b>	<b>381</b>	<b>(42%)</b>	<b>294</b>	<b>483</b>	<b>625</b>
<b>Investing Cashflow</b>												
Capex & Acquisitions	\$m	-464	-477	5	-473	-1495	213%	-1722	(13%)	-165	-1660	-357
Other	\$m	4	0	2	2	56		0		0	56	0
<b>Net Investing Cashflow</b>	<b>\$m</b>	<b>-460</b>	<b>-477</b>	<b>7</b>	<b>-471</b>	<b>-1439</b>	<b>202%</b>	<b>-1722</b>	<b>(16%)</b>	<b>-165</b>	<b>-1604</b>	<b>-357</b>
<b>Net Financing Cashflow</b>	<b>\$m</b>	<b>172</b>	<b>263</b>	<b>-287</b>	<b>-25</b>	<b>1328</b>	<b>406%</b>	<b>1470</b>	<b>(10%)</b>	<b>-174</b>	<b>1187</b>	<b>-288</b>
<b>Net Cashflow</b>	<b>\$m</b>	<b>106</b>	<b>-68</b>	<b>-64</b>	<b>-132</b>	<b>110</b>	<b>(261%)</b>	<b>129</b>	<b>(15%)</b>	<b>-45</b>	<b>66</b>	<b>-20</b>
Op C/f per share	\$	29.9	10.9	14.5	25.6	9.5	(13%)	16.4	(42%)	12.7	20.8	26.9
Dividend payout	%	56.8%	80.2%	60.3%	68.3%	94.5%	18%	54.9%	72%	71.1%	86.4%	68.7%

Source: Company data, Macquarie Research, February 2016

Using management measure of operating cashflow after maintenance capex, as the table below sets out, cashflow per share was 10.3¢, with maintenance capex at \$51m. This leaves ~\$100m of expansionary capex that is being funded by the balance sheet. The recent capital raisings and deleveraging of EDL (slightly more than \$150m) and UED (\$126m) provide some balance sheet capacity to fund this change thus deferring the question of how much should be funded with retained equity vs. new debt.

**Fig 5 Core Operating cash flow available to DUE**

Core Operating cashflow available to		2014	2015	Dec-15	Jun-16	2016	2017	2018	2019
EBITDA (ex customer contribut	\$ m	598	590	434	393	781	811	846	857
Cash interest paid (ex UED preference)	\$ m	-312	-276	-141	-115	-255	-234	-242	-246
Maintenance capex	\$ m	-72	-74	-51	-51	-102	-110	-106	-103
Other	\$ m	21	-30	-4	-16	-33	-15	-17	-14
<b>Operating cashflow post Maint</b>	<b>\$ m</b>	<b>234</b>	<b>210</b>	<b>239</b>	<b>211</b>	<b>392</b>	<b>452</b>	<b>482</b>	<b>494</b>
<b>per share</b>		<b>17.8</b>	<b>14.8</b>	<b>10.3</b>	<b>9.1</b>	<b>16.9</b>	<b>19.5</b>	<b>20.8</b>	<b>21.3</b>

Source: Company data, Macquarie Research, February 2016

- Using regulated depreciation for the DBP, UED and MGH instead of SIB capex, the cashflow was closer to ~9.2¢ per share, thus the dividend is covered by the current cashflow.
- In the current environment reiteration of dividend guidance of \$0.18 provides certainty for investors and is supported by the underlying cash from the business.

Fig 6 Investment Fundamentals (\$m)

DUE - Consolidated		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Valuation														
Dampier Bunbury Pipeline (Jan 2016)	\$m	1354	1475	1749	1716	1666	1622	1572	1516	1444	1381	1372	1319	1266
United Energy (Jan 2016)	\$m	804	922	913	877	930	934	940	941	892	894	895	896	889
Multinet (Jan 2018)	\$m	588	652	716	687	652	610	568	525	457	418	377	335	290
DDG	\$m		208	295	282	277	271	266	260	254	247	240	233	225
Energy Developments	\$m				1805	1781	1744	1684	1617	1562	1536	1531	1522	1513
DUE Corporate	\$m	-49	21	90	58	-24	-40	-56	-46	-35	-23	-19	6	5
Total Valuation	\$m	2,698	3,278	3,763	5,427	5,282	5,142	4,973	4,813	4,574	4,453	4,406	4,311	4,188
Per share	\$	2.31	2.49	2.52	2.34	2.28	2.22	2.14	2.07	1.97	1.92	1.90	1.86	1.80
Discount Rate		9.6%	8.3%	7.6%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%
RAB (+ DDG)	\$m	5,285	5,530	5,793	8,694	8,711	8,737	8,749	8,773	8,826	8,847	8,898	8,955	9,013
Growth	%	3.2%	4.6%	4.8%	50.1%	0.2%	0.3%	0.1%	0.3%	0.6%	0.2%	0.6%	0.6%	0.6%
Implied RAB Multiple	x	1.29	1.33	1.39	1.17	1.16	1.15	1.14	1.12	1.10	1.09	1.09	1.08	1.07
EV/RAB (proportionate)	x	130	130	131	117	118	118	119	119	120	120	121	121	121
ND/RAB	%	80%	80%	79%	82%	82%	83%	83%	83%	83%	84%	84%	84%	84%
Mkt Cap/RAB equity	x	2.57	2.67	2.37	134	135	137	139	141	142	144	146	147	148
EV/EBITDA (ex cust con)	x	118x	106x	118x	13.0x	12.3x	12.0x	119x	12.0x	12.5x	13.0x	12.9x	12.9x	12.9x
ND/EBITDA	x	7.8x	6.7x	7.2x	6.7x	6.5x	6.4x	6.4x	6.5x	6.9x	7.1x	7.1x	7.1x	7.2x
P & L (Consolidated)		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Revenue	\$m	1,313	1,251	1,269	1,616	1,715	1,783	1,819	1,838	1,821	1,806	1,846	1,884	1,911
Growth	%	7.5%	-4.7%	14%	27.3%	6.2%	3.9%	2.0%	1%	-10%	-0.8%	2.2%	2.0%	14%
EBITDA														
Dampier-Bunbury Pipeline	\$m	369	349	314	311	284	289	293	299	297	284	282	281	279
United Energy	\$m	319	333	360	332	279	286	291	288	298	314	324	335	347
Multinet	\$m	129	123	122	131	151	154	155	155	156	157	159	160	162
Energy Developments	\$m				185	245	270	274	274	236	202	208	211	209
DUE Corporate/DBPS	\$m	-128	-9	-22	-41	16	16	15	14	14	13	12	12	11
EBITDA	\$m	688	796	775	917	975	1,014	1,028	1,030	1,001	970	985	999	1,008
(ex customer contributions)	\$m	671	780	757	892	956	994	1,008	1,009	980	949	964	978	987
Margin	%	52%	64%	61%	57%	57%	57%	57%	56%	55%	54%	53%	53%	53%
Depreciation	\$m	-254	-266	-277	-375	-382	-381	-380	-378	-376	-375	-375	-375	-375
Net Interest Expense	\$m	-384	-429	-433	-371	-328	-333	-341	-344	-333	-340	-369	-374	-387
Average rate	%	-7.4%	-8.0%	-7.8%	-6.3%	-5.3%	-5.3%	-5.4%	-5.3%	-5.1%	-5.1%	-5.4%	-5.4%	-5.5%
PBT	\$m	50	102	65	190	265	300	308	308	292	254	242	250	245
Tax Expense	\$m	-30	91	-19	-52	-85	-90	-92	-97	-101	-84	-78	-78	-79
Minority Interests	\$m	-14	-3	2	-20	-1	-3	-4	-3	-4	-4	-2	-3	-2
PAT	\$m	6	190	48	117	179	207	212	209	187	165	162	169	164
EPS	€	0.5	5.2	3.2	7.2	7.7	8.9	9.2	9.0	8.1	7.1	7.0	7.3	7.1
Cashflow (consolidated)		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Operating Cash Flow														
EBITDA	\$m	688	796	775	968	975	1014	1028	1030	1001	970	985	999	1008
Net Interest Paid	\$m	-440	-424	-381	-349	-317	-325	-331	-334	-323	-332	-361	-366	-380
Tax Paid	\$m	0	0	-2	-4	-8	-10	-10	-10	-5	-11	-12	-12	-12
Other (dec Working Capital)	\$m	1	22	-30	-132	-26	-26	-24	-24	-5	-21	-25	-24	-23
Net Operating Cashflow	\$m	249	394	363	483	625	653	664	662	647	607	588	596	593
Net Investing Cashflow	\$m	-391	-460	-471	-1,604	-357	-338	-327	-328	-342	-346	-357	-368	-380
Net Financing Casflow	\$m	301	172	-25	1187	-288	-378	-359	-350	-351	-274	-250	-245	-240
Net Cashflow	\$m	159	106	-132	66	-20	-62	-22	-15	-46	-13	-18	-17	-27
Net Assets	\$m	1,497	1,787	2,084	3,418	2,998	2,554	2,054	1,535	985	461	-55	-563	-1,085
Net Debt (incl. Distribution pay)	\$m	5,366	5,361	5,597	6,137	6,343	6,481	6,603	6,712	6,868	6,912	7,024	7,139	7,267
Op C/f per share	\$	213	29.9	25.6	20.8	26.9	28.1	28.6	28.5	27.9	26.2	25.3	25.7	25.5
Dividend payout	%	77%	57%	68%	86%	69%	68%	68%	65%	64%	61%	59%	56%	56%
Core Operating cashflow available to		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
EBITDA (ex customer contribut	\$m	589	598	590	781	811	846	857	859	826	793	805	815	820
Cash interest paid (ex UED preference)	\$m	-330	-312	-276	-255	-234	-242	-246	-249	-237	-243	-266	-271	-280
Maintenance capex	\$m	-70	-72	-74	-102	-110	-106	-103	-103	-106	-102	-101	-100	-100
Other	\$m	-60	21	-30	-33	-15	-17	-14	-13	-10	-11	-16	-30	-30
Operating cashflow post M maint	\$m	129	234	210	392	452	482	494	494	473	436	421	413	410
per share		110	17.8	14.8	16.9	19.5	20.8	21.3	21.3	20.4	18.8	18.1	17.8	17.7
P.P. Cashflow post reg depreciation		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
EBITDA	\$m	589	598	590	781	811	846	857	859	826	793	805	815	820
Cash Interest	\$m	-330	-312	-276	-255	-234	-242	-246	-249	-237	-243	-266	-271	-280
Regulatory Depreciation	\$m	-86	-91	-101	-126	-126	-137	-132	-125	-41	-25	-23	-20	-18
Other	\$m	-60	21	-30	-33	-15	-17	-14	-13	-10	-11	-16	-30	-30
Op c/f post reg capex	\$m	113	215	183	368	437	451	466	471	538	513	499	494	493
per share		9.6	16.4	12.9	16.8	18.8	19.4	20.1	20.3	23.2	22.1	21.5	21.3	21.2
RAB chg	\$m	-165	-245	-263	-79	-18	-26	-12	-24	-53	-21	-51	-57	-58
Funding mix (65:35 DBP, 70:30 UED/M/GH, 70:30 UED/EDL equity finding	\$m	119	126	83	60	48	43	37	46	67	58	61	64	67
					0	0	0	0	0	0	0	0	0	0
Cash for dividend	\$m	67	96	2	348	467	468	491	493	552	550	509	500	502
ps		5.7	7.3	0.2	16.0	20.1	20.2	21.2	21.3	23.8	23.7	21.9	21.6	21.6
ps (excluding Other/WC)		11.5	5.7	2.3	16.4	20.8	20.9	21.8	21.8	24.2	24.2	22.6	22.9	22.9
DPS	€	16.5	17.0	17.5	18.0	18.5	19.0	19.5	18.7	17.9	15.8	14.9	14.4	14.2
Yield	%	7.1	7.3	7.5	7.7	7.9	8.1	8.3	8.0	7.6	6.8	6.4	6.1	6.1
Franking	%				10%	6%	7%	8%	8%	8%	10%	11%	12%	12%
Coverage of distributions		-3%	49%	98%	42%	86%	89%	90%	95%	93%	93%	93%	93%	91%
EFPROA	m	1,169	1,317	1,417	2,320	2,320	2,320	2,320	2,320	2,320	2,320	2,320	2,320	2,320
Balance Sheet (Consolidated)		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Assets														
Cash (Assets)	\$m	278	283	47	74	131	92	90	81	65	55	44	35	10
Corporate Cash	\$m	124	226	329	369	292	268	249	242	212	210	201	194	192
Tangible Assets	\$m	5,614	5,785	6,003	7,057	7,093	7,108	7,111	7,115	7,133	7,153	7,183	7,223	7,272
Intangible Assets	\$m	2,087	2,068	2,034	3,008	2,944	2,882	2,822	2,765	2,709	2,656	2,604	2,554	2,506
Other	\$m	377	462	741	917	914	910	904	892	860	841	833	837	839
Total Assets	\$m	8,480	8,823	9,154	11,425	11,374	11,263	11,175	11,095	10,979	10,914	10,866	10,843	10,819
Liabilities														
Debt	\$m	5,672	5,668	5,731	6,240	6,348	6,401	6,495	6,595	6,701	6,806	6,914	7,028	7,137
Corp. Debt	\$m	0	0	0	0	0	0	0	0	0	0	0	0	0
Creditors	\$m	235	242	187	217	222	228	231	233	227	226	229	232	234
Provisions	\$m	166	184	194	279	291	291	297	290	260	257	249	242	240
Tax payable/DITL	\$m	518	611	667	958	1,192	1,459	1,759	2,095	2,450	2,799	3,154	3,522	3,902
Other	\$m	393	330	291	314	322	331	340	348	357	365	374	383	391
Total Liabilities	\$m	6,983	7,035	7,070	8,008	8,376	8,710	9,121	9,560	9,994	10,453	10,921	11,406	11,901

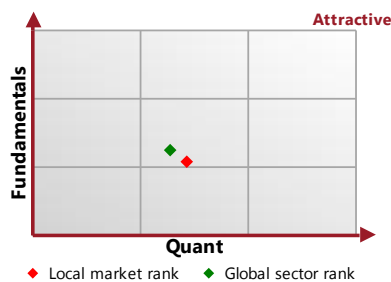
## Macquarie Quant View

The quant model currently holds a neutral view on DUET Group. The strongest style exposure is Valuations, indicating this stock is under-priced in the market relative to its peers. The weakest style exposure is Quality, indicating this stock is likely to have a weaker and less stable underlying earnings stream.

**226/392**

Global rank in  
Utilities

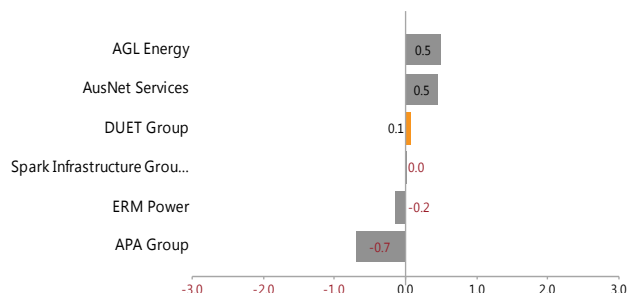
% of BUY recommendations 30% (3/10)  
Number of Price Target downgrades 0  
Number of Price Target upgrades 2



Displays where the company's ranked based on the fundamental consensus Price Target and Macquarie's Quantitative Alpha model.  
Two rankings: Local market (Australia & NZ) and Global sector (Utilities)

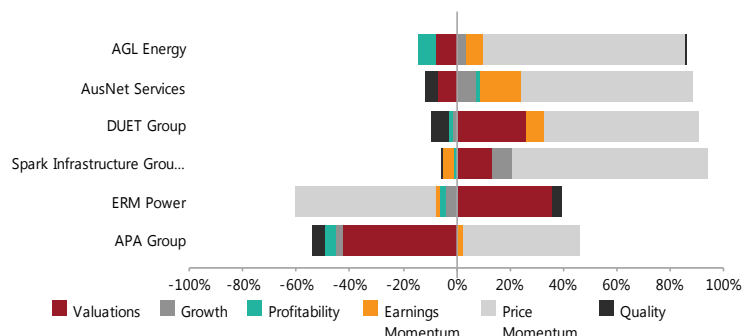
### Macquarie Alpha Model ranking

A list of comparable companies and their Macquarie Alpha model score (higher is better).



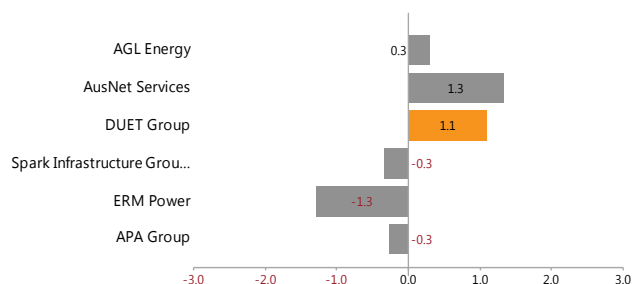
### Factors driving the Alpha Model

For the comparable firms this chart shows the key underlying styles and their contribution to the current overall Alpha score.



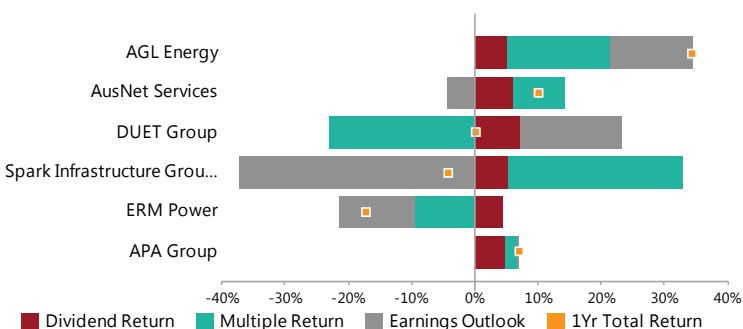
### Macquarie Earnings Sentiment Indicator

The Macquarie Sentiment Indicator is an enhanced earnings revisions signal that favours analysts who have more timely and higher conviction revisions. Current score shown below.



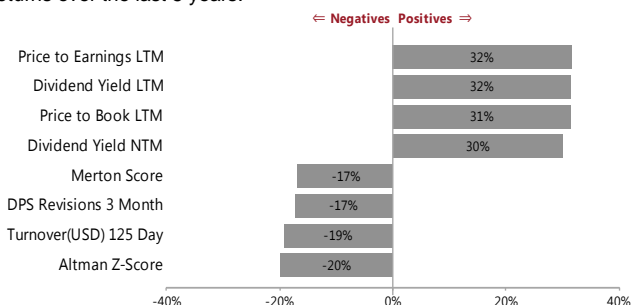
### Drivers of Stock Return

Breakdown of 1 year total return (local currency) into returns from dividends, changes in forward earnings estimates and the resulting change in earnings multiple.



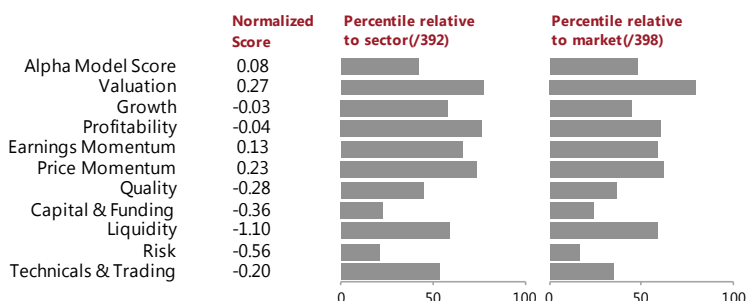
### What drove this Company in the last 5 years

Which factor score has had the greatest correlation with the company's returns over the last 5 years.



### How it looks on the Alpha model

A more granular view of the underlying style scores that drive the alpha (higher is better) and the percentile rank relative to the sector and market.



Source (all charts): FactSet, Thomson Reuters, and Macquarie Research. For more details on the Macquarie Alpha model or for more customised analysis and screens, please contact the Macquarie Global Quantitative/Custom Products Group ([cpq@macquarie.com](mailto:cpq@macquarie.com))

## Important disclosures:

**Recommendation definitions****Macquarie - Australia/New Zealand**

Outperform – return >3% in excess of benchmark return  
 Neutral – return within 3% of benchmark return  
 Underperform – return >3% below benchmark return

Benchmark return is determined by long term nominal GDP growth plus 12 month forward market dividend yield

**Macquarie – Asia/Europe**

Outperform – expected return >+10%  
 Neutral – expected return from -10% to +10%  
 Underperform – expected return <-10%

**Macquarie – South Africa**

Outperform – expected return >+10%  
 Neutral – expected return from -10% to +10%  
 Underperform – expected return <-10%

**Macquarie - Canada**

Outperform – return >5% in excess of benchmark return  
 Neutral – return within 5% of benchmark return  
 Underperform – return >5% below benchmark return

**Macquarie - USA**

Outperform (Buy) – return >5% in excess of Russell 3000 index return  
 Neutral (Hold) – return within 5% of Russell 3000 index return  
 Underperform (Sell) – return >5% below Russell 3000 index return

**Volatility index definition\***

This is calculated from the volatility of historical price movements.

**Very high-highest risk** – Stock should be expected to move up or down 60–100% in a year – investors should be aware this stock is highly speculative.

**High** – stock should be expected to move up or down at least 40–60% in a year – investors should be aware this stock could be speculative.

**Medium** – stock should be expected to move up or down at least 30–40% in a year.

**Low-medium** – stock should be expected to move up or down at least 25–30% in a year.

**Low** – stock should be expected to move up or down at least 15–25% in a year.

\* Applicable to Asia/Australian/NZ/Canada stocks only

**Recommendations** – 12 months

**Note:** Quant recommendations may differ from Fundamental Analyst recommendations

**Financial definitions**

All "Adjusted" data items have had the following adjustments made:

Added back: goodwill amortisation, provision for catastrophe reserves, IFRS derivatives & hedging, IFRS impairments & IFRS interest expense  
 Excluded: non recurring items, asset revals, property revals, appraisal value uplift, preference dividends & minority interests

**EPS** = adjusted net profit / efpowa\*

**ROA** = adjusted ebit / average total assets

**ROA Banks/Insurance** = adjusted net profit / average total assets

**ROE** = adjusted net profit / average shareholders funds

**Gross cashflow** = adjusted net profit + depreciation

\*equivalent fully paid ordinary weighted average number of shares

All Reported numbers for Australian/NZ listed stocks are modelled under IFRS (International Financial Reporting Standards).

**Recommendation proportions – For quarter ending 31 December 2015**

	AU/NZ	Asia	RSA	USA	CA	EUR	
Outperform	50.68%	61.04%	53.16%	47.90%	65.22%	43.59%	(for global coverage by Macquarie, 5.33% of stocks followed are investment banking clients)
Neutral	31.51%	24.66%	34.18%	47.70%	29.71%	34.62%	(for global coverage by Macquarie, 5.02% of stocks followed are investment banking clients)
Underperform	17.81%	14.30%	12.66%	4.39%	5.07%	21.79%	(for global coverage by Macquarie, 3.78% of stocks followed are investment banking clients)

**DUE AU vs ASX 100, & rec history**

(all figures in AUD currency unless noted)

Note: Recommendation timeline – if not a continuous line, then there was no Macquarie coverage at the time or there was an embargo period.

Source: FactSet, Macquarie Research, February 2016

**12-month target price methodology**

DUE AU: A\$2.31 based on a DCF methodology

**Company-specific disclosures:**

**DUE AU:** Any inability to compete successfully in their markets may harm the business. This could be a result of many factors which may include geographic mix and introduction of improved products or service offerings by competitors. The results of operations may be materially affected by global economic conditions generally, including conditions in financial markets. The company is exposed to market risks, such as changes in interest rates, foreign exchange rates and input prices. From time to time, the company will enter into transactions, including transactions in derivative instruments, to manage certain of these exposures.

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Date	Stock Code (BBG code)	Recommendation	Target Price
21-May-2014	DUE AU	Outperform	A\$2.38
21-Feb-2014	DUE AU	Neutral	A\$2.05
16-Jan-2014	DUE AU	Neutral	A\$2.08
02-Sep-2013	DUE AU	Neutral	A\$2.15
02-Jul-2013	DUE AU	Neutral	A\$2.20

**Target price risk disclosures:**

**DUE AU:** Any inability to compete successfully in their markets may harm the business. This could be a result of many factors which may include geographic mix and introduction of improved products or service offerings by competitors. The results of operations may be materially affected by global economic conditions generally, including conditions in financial markets. The company is exposed to market risks, such as changes in interest rates, foreign exchange rates and input prices. From time to time, the company will enter into transactions, including transactions in derivative instruments, to manage certain of these exposures.

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