Jemena Electricity Networks (Vic) Ltd

2016-20 Electricity Distribution Price Review Regulatory Proposal

Revocation and substitution submission

Attachment 6-5 Frontier Economics - The relationship between government bond yields and the market risk premium

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The relationship between government bond yields and the market risk premium

REPORT PREPARED FOR JEMENA ELECTRICITY NETWORKS, ACTEWAGL, AUSNET SERVICES, AUSTRALIAN GAS NETWORKS, CITIPOWER, POWERCOR AND UNITED ENERGY

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Executive Summary

1.1 Context

1 Frontier Economics (**Frontier**) has been retained by Jemena Electricity Networks, ActewAGL, Ausnet Services, Australian Gas Networks, CitiPower, Powercor and United Energy to provide our views on the relationship between government bond yields and the market risk premium (**MRP**).

2 Specifically, we have been asked to:

a. Review movements in CGS yields since December 2013 and consider the factors that have contributed to the pattern of CGS yields since this time and whether these factors are also likely to have impacted upon the required return on equity over this period, considering (among other relevant information):

   i. statements and analysis provided by the Reserve Bank of Australia; and

   ii. previous analysis of CGS yields by other experts, including SFG Consulting and Competition Economists Group.

b. Consider how current market conditions (that is, market conditions prevailing in November and December 2015) compare to average market conditions and any implications arising from this comparison for the required return on equity over the next 10 years.

c. In light of our opinion on the above matters, and any other matters the we consider relevant, concludes whether it is appropriate to use the Sharpe-Lintner Capital Asset Pricing Model (**SL-CAPM**) in the way that the AER has to estimate the return on equity and, in particular, to adopt an approach that uses a fixed or relatively inflexible market risk premium parameter.

3 In preparing the report, we have been asked to:

a. Consider the theoretical and empirical support for the factors and conditions identified;

b. Consider any relevant comments raised by the AER and other regulators, and experts engaged by those regulators; and

c. Use robust methods and data in producing any statistical estimates.

4 A copy of the terms of reference for this report is attached at Appendix 1 to this report.

5 This report has been authored by Professor Stephen Gray. Stephen Gray is Professor of Finance at the UQ Business School, University of Queensland and Director of Frontier Economics, a specialist economics and corporate finance consultancy. He has Honours degrees in Commerce and Law from the University of Queensland and a PhD in Financial Economics from Stanford University. He

teaches graduate level courses with a focus on cost of capital issues, he has published widely in high-level academic journals, and he has more than 15 years' experience advising regulators, government agencies and regulated businesses on cost of capital issues.

6 The author's curriculum vitae is attached as Appendix 2 to this report.

7 The author's opinions set out in this report are based on the specialist knowledge acquired from his training and experience set out above. The author has 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). The author has read, understood and complied with the Expert Witness Guidelines.

1.2 Summary of conclusions

1.2.1 Evidence of an elevated MRP in the prevailing market conditions

8 In our view, there is a substantial body of evidence to support the propositions that, since the AER's 2013 Guideline:

a. The required return on equity has remained relatively stable; and

b. The MRP has increased at the same time that government bond yields have declined.

9 This evidence includes the following:

a. The AER's own DGM estimates indicate that the MRP has risen materially between the Guideline, the AER's November 2014 draft decisions and the AER's October 2015 preliminary decisions.

b. The AER's own Wright estimates indicate that the MRP has risen materially between the Guideline, the AER's November 2014 draft decisions and the AER's October 2015 preliminary decisions.

c. After reviewing an analysis of earnings yields and market intelligence conducted by the Reserve Bank of Australia (**RBA**), the Governor of the RBA has recently concluded that:

> …the equity risk premium observed ex post has risen even as the risk-free rate has fallen and by about an offsetting amount.[1]

d. HoustonKemp (2016) documents a material and statistically significant inverse relationship between the prevailing government

[1] Glenn Stevens, Speech to the Australian American Association, New York, 21 April 2015. Emphasis added.

bond yield and the equity premium that is applied by independent expert valuation professionals.

e. Leading market practitioners have recently concluded that the recent falls in government bond yields have been offset by increases in the equity risk premium. For example, McKinsey Inc. conclude that:

> 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…This implies that even if investors believe the risk-free rate has fallen, they have offset this with a higher equity risk premium.[2]

Similarly, JP Morgan conclude that:

> So even with a relatively low Treasury rate, the currently high equity risk premium leads to a cost of equity higher than it has been historically.[3]

f. A number of other regulators and their advisors have concluded that the allowed return on equity should be held steady in the face of falling government bond yields. For example, Ofgem's advisers have recently advised 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.[4]

and:

> …there is no empirical basis for the assumption that falls in risk-free rates should translate to falls in expected market returns.[5]

In a recent decision, the US Federal Energy Regulatory Commission 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, but concluded that in the prevailing market conditions such an approach "may not produce a rational result."[6] The Commission concluded 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.[7]

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[2] Dobbs, Koller and Lund (2014), pp. 17-18.

[3] Zenner and Junac (2012), p. 3.

[4] Wright and Smithers (2014), p. 2.

[5] Wright and Smithers (2014), p. 15.

[6] FERC Opinion 531, June 2014, Paragraph 159.

[7] FERC Opinion 531, June 2014, Paragraph 160.

Similarly, 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.[8]

The ERA selected a higher estimate of the MRP by giving material weight to the Wright approach and DGM estimates.

In addition, IPART applies a default 50% weight to forward-looking estimates of the MRP – primarily a number of DGM specifications.[9] In its most recent update, IPART adopts a contemporaneous MRP of 7.9%.[10]

g. Between the AER's November 2014 and October 2015 decisions, observed debt risk premiums remained relatively constant even though government bond yields declined materially.

1.2.2 Conclusions on questions in our terms of reference

10 Our terms of reference set out a number of specific questions for us to consider. Our conclusions on those questions are summarised below and are set out in more detail in Section 3 of this report.

Consider the factors that have caused government bond yields to decline since December 2013 and whether those factors also affected the required return on equity over this period

11 The Australian 10-year government bond yield has fallen from 4.2% at the time of the AER's 2013 Guideline to 2.76% in its October 2015 decisions. In a recent speech, Governor of the Reserve Bank Glenn Stevens suggested that government bond yields are at historical lows due to the unprecedented monetary easing of central banks.

12 Other contributing factors to the decline in government bond yields might include expectations of low inflation, concerns about future economic growth and the sustainability of a recovery in the US economy, and a shortage in the global supply

[8] ERA, ATCO Gas Final Decision, Paragraph 1173.

[9] IPART, Review of WACC Methodology, December 2013.

[10] IPART, WACC Biannual update, August 2015.

of government bonds as government debt is being reduced from the record levels observed in the wake of the GFC.[11]

13 Guy Debelle, Deputy Governor of the Reserve Bank, has recently concluded that the biggest contributor to the decline in yields is the demand/supply imbalance. Australia has a low ratio of government debt to GDP, whereas there is substantial demand for Australian government bonds from foreign investors and banks (who require high quality liquid assets to meet new banking regulations).

14 Some of the factors considered above appear to be unique to the government bond market. For example, banking regulations increase the demand for government bonds but not equity, and the demand from foreign investors has been much more pronounced in the government bond market than the equity market.

15 Ultimately, the question of whether the factors that have led to the decline in government bond yields have also had an effect on the required return on equity is an empirical question. As set out above, the evidence suggests that the required return on equity has remained stable and has not fallen in lockstep with the decline in government bond yields.

Consider how current market conditions compare to average market conditions and what this means for how the required return on equity should be estimated in the prevailing market conditions

16 The obvious difference between the prevailing market conditions and the average historical market conditions is that government bond yields are currently at historical lows. In our view, the AER's approach of applying a fixed risk premium should be replaced with an approach of estimating a risk premium that is commensurate with the prevailing conditions in the market. This approach consistently combines estimates of the risk-free rate and MRP that both reflect the same prevailing conditions in the market.

Consider whether it is appropriate to assume that the required return on equity moves one-for-one with changes in CGS yields

17 For the reasons set out above, our view is that it is not appropriate to assume that the required return on equity moves in lockstep with changes in government bond yields, or (equivalently) that the MRP is a fixed constant.

Consider whether it is appropriate to estimate the required return on equity using an MRP estimate that reflects average market conditions over a long historical period

18 The mean historical excess returns estimate of the MRP reflects the average market conditions over the historical period that was used. In our view, this is relevant information that should form part of the evidence that is considered when

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[11] See for example, comments from AMP Chief Economist Shane Oliver at http://www.ampcapital.com.au/article-detail?alias=/olivers-insights/february/why-are-bond-yields-so-low, and

selecting a final estimate of the MRP. This estimate would receive material weight if the prevailing market conditions were similar to the average historical market conditions.

19 However, the prevailing market conditions are currently materially dissimilar to the average historical conditions in that government bond yields are at historical lows. A technique that estimates the MRP by subtracting the average government bond yield from the average market return may produce a reasonable estimate of the prevailing MRP when the current government bond yield is near its historical average. However, that is not the case at present.

20 Moreover, if the MRP is estimated as the long-run mean of historical excess returns, it will remain effectively constant over time – as only one additional data point is produced each year. Such a constant estimate of the MRP inevitably produces estimates of the required return on equity that move in lockstep with changes in government bond yields. For the reasons set out above, our view is that such a lock-step estimate is inconsistent with the evidence.

1.2.3 The AER's approach to its own DGM and Wright estimates of the MRP

21 The AER's own Wright and DGM estimates indicate that the market risk premium has increased materially since its December 2013 Guideline. However, the AER has maintained a fixed MRP of 6.5% in every one of its draft, preliminary and final decisions since the Guideline.

22 If the AER were to adopt the approach of applying real weight to its own Wright and DGM estimates, the result would be more stable estimates of the allowed return on equity over time. In our view, this would be consistent with the actual returns that investors require and it would also be in the long-term interests of consumers (other things being equal) to have less volatility in allowed returns.

23 The AER made these very points in its Rate of Return Guideline materials:

> …a relatively stable regulatory return on equity would have two effects:
>
> - It would smooth prices faced by consumers.
> - It would provide greater certainty to investors about the outcome of the regulatory process.[12]

and:

> Submissions in response to our draft guideline were also broadly supportive of stability.[13]

and:

[12] AER Rate of Return Guideline, Explanatory Statement, pp. 65-66.

[13] AER Rate of Return Guideline, Explanatory Statement, pp. 65-66.

> …the DGM and the Wright approach (for implementing the Sharpe–Lintner CAPM) will result in estimates of the return on equity that may be relatively stable over time.[14]

24 However, the AER's decisions since its Guideline have applied no real weight to its DGM and Wright estimates. Rather, the AER's estimate of the MRP has remained constant throughout despite the AER's own DGM and Wright estimates indicating material increases in the MRP over the same period.

25 The AER's approach of adding a constant fixed MRP to the prevailing government bond yield produces a "yo-yo" or "lottery" effect in its allowed return on equity. Thus, the benefits of more stability in the allowed return on equity that were foreshadowed in the AER's Guideline have proved to be illusory in practice.

[14] AER Rate of Return Guideline, Explanatory Statement, p. 66.

2 Evidence from the prevailing market conditions

2.1 Overview

26 In this section of the report, we review a range of evidence relating to the market risk premium in the prevailing market conditions. The weight of this evidence is entirely consistent with the AER's own DGM and Wright evidence, which we consider in the next two sub-sections below:

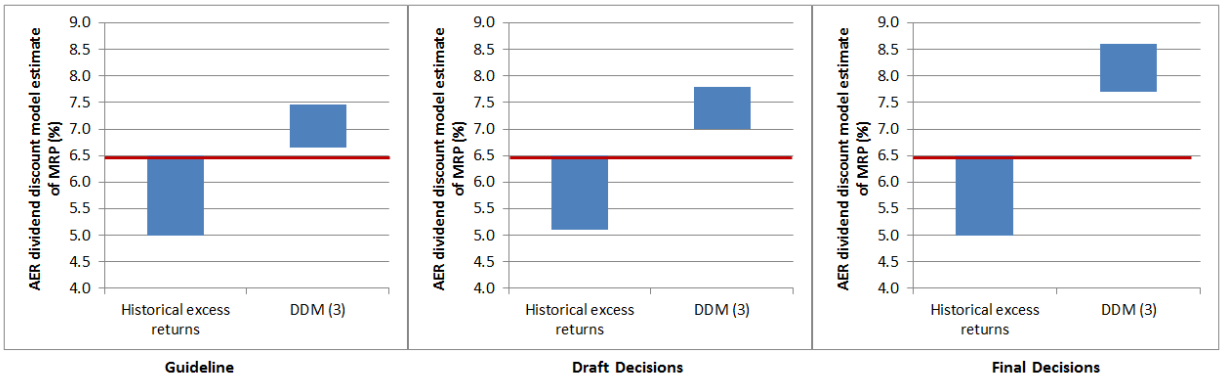
a. The required return on the market has remained relatively stable over the last year or two; and

b. The MRP has increased to offset the material decline in the risk-free rate that has occurred over that period.

2.2 The AER's DGM estimates of the MRP

27 The AER has most recently updated its DGM estimates of the MRP in its decisions in October and November 2015. The evolution of the AER's DGM estimates of the MRP (from its Rate of Return Guideline, to its November 2014 draft decisions, to its October and November 2015 final, preliminary and draft decisions[15]) is summarised in Figure 1 below.

Figure 1: AER estimates of MRP from historical excess returns and the DGM



Source: AER Rate of Return Guideline (Dec 2013), AER draft decisions (Nov 2014), AER final and preliminary decisions (Oct 2015).

28 Figure 1 shows that:

[15] AER Final Decisions for ENERGEX, Ergon and SA Power Networks, Preliminary Decision for JEN, and Draft Decisions for the ACT and SA gas distribution businesses.

a. The AER's primary range from historical excess returns has remained stable, as would be expected for a long-term historical average;[16]

b. The AER's DGM estimate has increased materially from the Guideline to draft decisions to preliminary and final decisions;[17] and

c. The AER's point estimate for the MRP has remained fixed at the 6.5% upper bound of its primary range throughout.

29 The AER's preferred DGM estimate of MRP continues to be based on its three-stage model and its mid-point 4.6% estimate of long term growth.[18] Using this approach, the AER's MRP estimates are:

a. 7.1% in its Guideline;[19]

b. 7.4% in its draft decisions in November 2014;[20] and

c. 8.2% in its October 2015 decisions.[21]

30 That is, the AER's DGM estimates of the MRP have increased uniformly as the 10-year government bond yield has fallen.

31 Moreover, the AER's DGM estimates of the required return on the market portfolio (i.e., the sum of the risk-free rate and the MRP) have remained constant over the last year – between the AER's November 2014 draft decisions and its October 2015 preliminary decisions – as set out in Table 1 below.

[16] The AER increased the lower bound of its primary range from 5.0% to 5.1% between the Guideline and its November 2014 draft decisions, reflecting the additional annual observation that became available. This was reduced back to 5.0% in the October 2015 decisions on the basis that the AER no longer sets the bottom of the range by adding 20 basis points to the maximum geometric mean estimate, but now simply "has regard to" the geometric mean estimates [JEN Preliminary Decision, Footnote 377, p. 3-114]. The upper bound has remained fixed at 6.5% throughout.

[17] Figure 1 shows the AER's range for its preferred three-stage DGM. The AER states that it has lesser regard to estimates from its two stage model (the AER states this is used as a cross check), which also increase materially between the Guideline and the recent final decisions.

[18] TransGrid Final Decision, Table 3-36, p. 301 and Table 3-40, p. 3-305; JEN Preliminary Decision, p. 3-341.

[19] AER Rate of Return Guideline, Appendix D, p. 87.

[20] TransGrid Draft Decision, Attachment 3, p. 200.

[21] JEN Preliminary Decision, Table 3-42, p. 3-362.

Table 1: AER DGM estimates

AER decision	Risk-free rate	AER DGM mid-point MRP estimate	Implied required return on the market
Nov 2014 draft decisions	3.55%	7.4%	10.95%
Oct 2015 preliminary decisions	2.76%	8.2%	10.96%

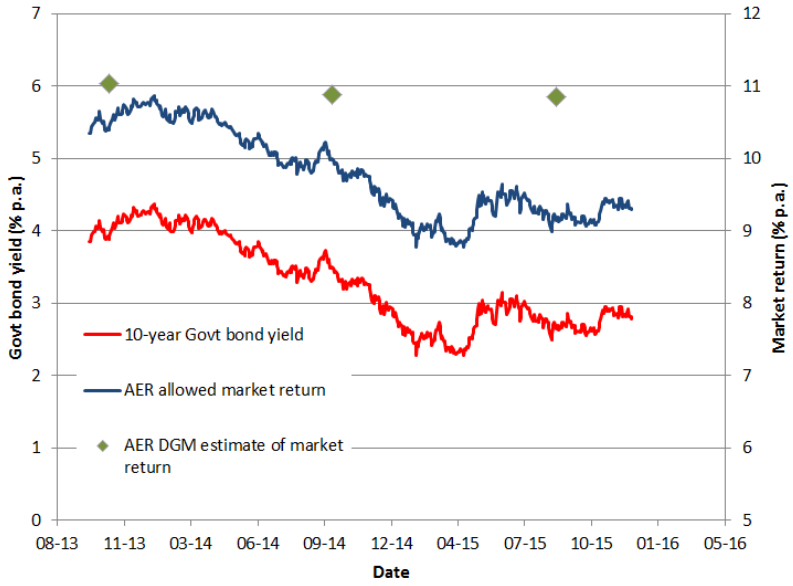
Source: AER draft decisions (Nov 2014), AER final and preliminary decisions (Oct 2015).

32 This evidence is consistent with the required return on equity being unchanged such that the fall in government bond yields is offset entirely by an increase in the MRP. Indeed, this is borne out clearly in Figure 2 below, which shows that:

a. The AER's approach has been to set the allowed market return at a fixed 6.5% above the prevailing government bond yield; whereas

b. The AER's own DGM estimates of the market return have been very stable, even in the face of a material decline in government bond yields.

Figure 2: Government bond yields and AER estimates of the required return on the market



Source: RBA, AER decisions, Frontier calculations.

2.3 The AER's Wright estimates

33 The AER's Wright approach estimates of the MRP and the required return on the market are consistent with its DGM estimates, as set out in Table 2 below. That table shows that between the November 2014 draft decisions and October 2015 draft and preliminary decisions the 10-year government bond yield fell by 79 basis points and the AER's estimate of the MRP (using the Wright approach) increased

by 70 basis points, leaving the estimate of the required return on the market portfolio virtually unchanged.

Table 2: AER Wright estimates

AER decision	Risk-free rate	AER DGM mid-point MRP estimate	Implied required return on the market
Nov 2014 draft decisions	3.55%	7.9%	11.45%
Oct 2015 preliminary decisions	2.76%	8.6%	11.36%

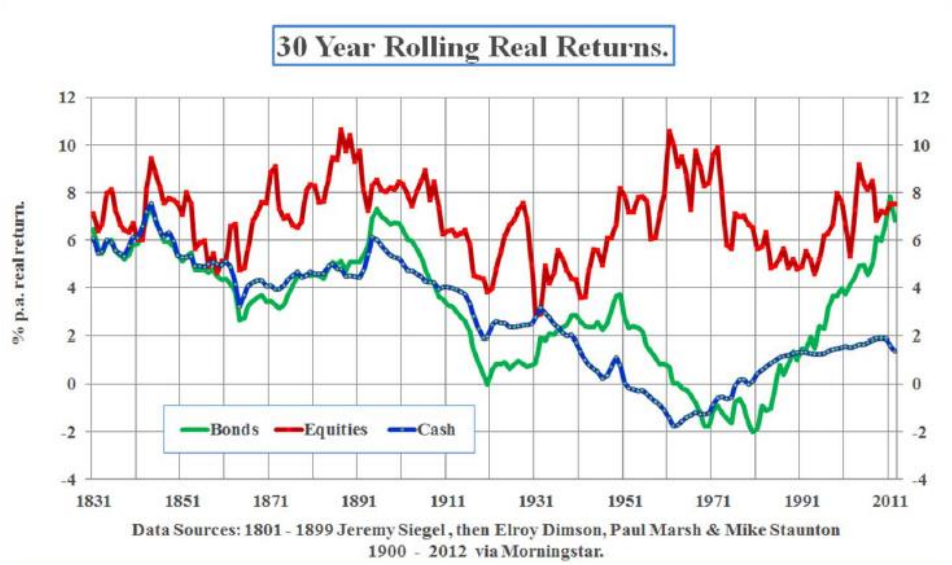
Source: AER draft decisions (Nov 2014), AER final and preliminary decisions (Oct 2015).

34 This evidence is consistent with the required return on equity being unchanged such that the fall in government bond yields is offset entirely by an increase in the MRP – consistent with the AER's DGM evidence.

35 The AER correctly recognises that the Wright approach implies a negative relationship between the risk-free rate and the MRP such that the required real return on equity is relatively stable over time.[22] The AER then argues that it should place relatively little weight on its Wright estimates because "the empirical evidence [of such a negative relationship] is not compelling."[23]

36 However, UK regulators and their advisers have reached the opposite conclusion to the AER and give material weight to the Wright approach when estimating the MRP. For example, in a recent report for Ofgem, Wright and Smithers (2014) show that the real return on equity has in fact been remarkably stable over a long period of time, as set out in Figure 3 below.

Figure 3: Historical stability of the real return on equity



[22] JEN Preliminary Decision, p. 3-86.

[23] JEN Preliminary Decision, p. 3-86.

Source: Wright and Smithers (2014), Figure 1.1, p. 4.

37 Wright and Smithers (2014) advise that:

> …the Ofgem approach [i.e., what the AER refers to as the Wright 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.[24]

38 Similarly, the ERA has conducted its own statistical tests and concluded that

> The results indicated the market *return on equity* was stationary [consistent with the Wright approach for estimating the MRP]...with the analysis supporting a conclusion that the MRP is non-stationary [suggesting that the historical excess returns approach should not be used to estimate the MRP]. This finding led the Authority to the important conclusion that the long run historical estimate of 6 per cent could be a poor predictor of the MRP prevailing in future regulatory periods.[25]

39 Thus, the AER's Wright estimates of the MRP corroborate the AER's DGM estimates of the MRP – implying that the MRP has risen to offset the recent decline in government bond yields, leaving the required return on equity largely stable over the period since the AER's 2013 Guideline.

2.4 Evidence from the Reserve Bank of Australia

2.4.1 Governor Stevens' comments

40 The proposition that there is a strong offsetting relationship between the risk-free rate and the MRP in the prevailing market conditions was recently endorsed by Reserve Bank Governor Glenn Stevens. In a speech in New York on 21 April 2015, Governor 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**.[26]

[24] Wright and Smithers (2014), p. 2.

[25] ERA, ATCO Gas Final Decision, 2015, Paragraphs 1169-70.

[26] Glenn Stevens, Speech to the Australian American Association, New York, 21 April 2015. Emphasis added.

Graph 2

Earnings and Sovereign Bond Yields

* Trailing earnings-to-price ratio for the MSCI Australia and S&P 500 indices

** Prior to 1996 for Australia and 2000 for the United States, 10-year sovereign yields are deflated using underlying inflation

Sources: ABS; Bloomberg; Board of Governors of the Federal Reserve System; MSCI; RBA; Thomson Reuters; Yieldbroker

41 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 shifted, despite the exceptionally low returns available on low-risk assets**.[27] [Emphasis added]

42 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.[28]

2.4.2 The AER's response

43 In its October and November 2015 decisions, the AER has set out its interpretation of Governor Stevens' comments. The AER concludes that:

> …these statements by the RBA may not be applicable to the required rate of return in financial markets.[29]

44 The AER justifies this conclusion with reference to the assertion from Partington and Satchell (October 2015) that:

> Governor Stevens comment that there is a pick-up in financial risk taking suggests a reducing risk premium in financial markets, which is the risk premium relevant to the determination of the weighted average cost of capital.[30]

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[27] Glenn Stevens, Speech to the Australian American Association, New York, 21 April 2015. Emphasis added.

[28] Glenn Stevens, Speech to the Australian American Association, New York, 21 April 2015.

[29] JEN Preliminary Decision, p. 3-425.

[30] JEN Preliminary Decision, p. 3-425.

45 That is, Partington and Satchell (October 2015) interpret Governor Stevens' comments as supporting a *reduction* in the MRP. In our view, no reasonable assessment of Governor Stevens' comments could possibly reach the conclusion that they support a reduction in the MRP. Indeed the whole point of the speech, in Governor Stevens' own words, is that:

> …the equity risk premium observed ex post has risen even as the risk-free rate has fallen and by about an offsetting amount.[31]

46 Partington and Satchell (October 2015) appear to have been misled by their confusion about the reference to a possible "pick-up in financial risk-taking." Even if the *volume* of funds being invested in risky financial investments is growing, this tells us nothing about the *price* being demanded by investors. In this regard, the whole point of Graph 2 in Governor Stevens' comments (reproduced above) is that the price being demanded by equity investors has *not* changed, even as the government bond yield has declined materially. This inevitably leads to Governor Stevens' conclusion that "the equity risk premium…has risen." [32]

47 The AER also draws a distinction between hurdle rates on new investment (i.e., the expected return that is required before a firm will actually commit equity funds to a real investment project) and the theoretical WACC. On this point, the AER relies on the following conjecture from Partington and Satchell (October 2015):

> With regard to the risk premium that managers are requiring to undertake new projects this may have become disconnected from the risk premium in financial markets.[33]

48 The suggestion here is that firms are very slow to change their hurdle rates, so that hurdle rates have remained stable over recent years whereas the returns that equity investors require has fallen in line with the recent decline in government bond yields. This suggestion implies that the providers of equity capital would require a particular return, but corporate managers would refuse to implement the wishes of their shareholders, instead requiring a materially higher return on any investments in current market conditions.

49 Partington and Satchell (October 2015) provide no evidence of such a disconnection between corporate managers and their shareholder owners, but merely raise the possibility that such a disconnection "may" occur. Rather, the evidence in Governor Stevens' speech is that the scenario that Partington and Satchell conjecture may occur has, in fact, not occurred. Graph 2 clearly shows that the return required by equity investors has remained stable even as the government bond yield has declined. Moreover, Graph 2 above is not about hurdle rates that corporate managers may require. It is based on the price that equity investors have established for shares in the prevailing market conditions.

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[31] Glenn Stevens, Speech to the Australian American Association, New York, 21 April 2015.

[32] Glenn Stevens, Speech to the Australian American Association, New York, 21 April 2015.

[33] JEN Preliminary Decision, p. 3-425.

2.5 Evidence from independent expert valuation reports

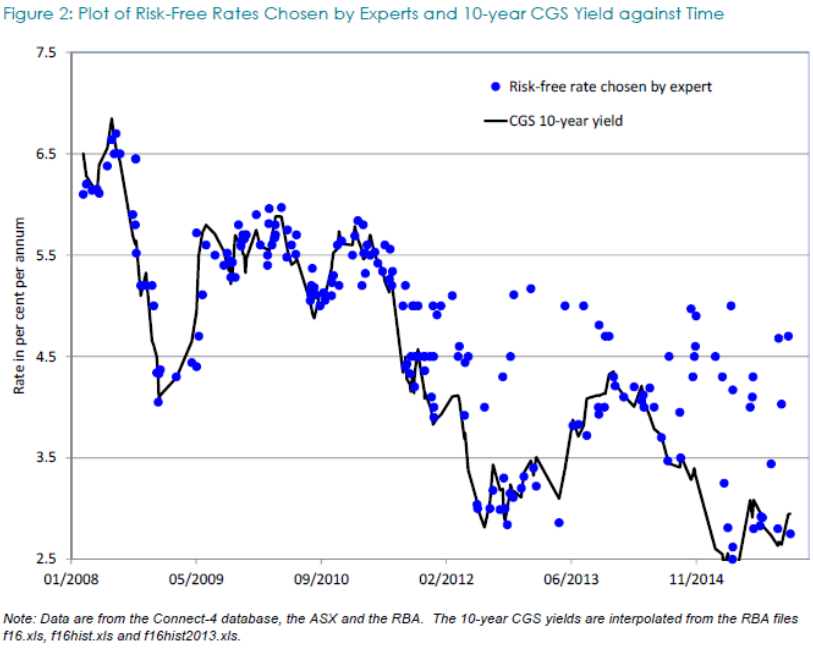
2.5.1 Updated evidence

50 HoustonKemp (2016) examines the 195 independent expert valuation reports in the Connect-4 database from January 2008 to the present. HoustonKemp reports that:

a. The independent experts used a range of estimates for the MRP, averaging 6.27% (prior to any adjustment for the assumed value of dividend imputation tax credits); and

b. A number of expert reports adopted a risk-free rate in excess of the prevailing 10-year government bond yield as a market-wide adjustment to offset the recent decline in government bond yields, as summarised in Figure 4 below.

Figure 4: Risk-free rates adopted by independent experts



Source: HoustonKemp (2016), Figure 2, p. 14.

51 For each report, HoustonKemp (2016) computes the effective estimate of the return on the market as the sum of the expert's estimate of the risk-free rate and MRP. HoustonKemp then subtracts the contemporaneous 10-year government bond yield to produce an estimate of the effective MRP.

52 HoustonKemp then uses regression analysis to quantify the relationship between the effective MRP used by independent experts and the contemporaneous 10-year government bond yield. He reports a statistically significant inverse relationship.[34] For every 1% fall in the government bond yield, the effective MRP increases by approximately 25 basis points. Thus, there is evidence that, in the current market conditions, independent expert valuation professionals effectively adopt a higher MRP as government bond yields fall. This evidence is inconsistent with the AER's contention that the MRP has remained constant as the government bond yield has fallen, so that the required return on equity has fallen one-for-one with the government bond yield.

53 Figure 4 above shows that the propensity for independent experts to make adjustments to offset the decline in government bond yields has been larger and more pronounced since 2012. That is, there is a greater tendency for independent experts to offset the decline in government bond yields in the prevailing market conditions. We note that this is consistent with the AER's DGM estimates. The fact that independent experts are offsetting a material proportion of the decline in government bond yields is also consistent with the application of weight to both

[34] Depending on how standard errors are computed, the slope coefficient is between 3 and 7 times the standard error.

the historical excess returns approach (which assumes no offset) and the Wright approach (which assumes 100% offset).

54 All of the calculations above reflect the extent to which independent experts have adopted a risk-free rate in excess of the prevailing 10-year government bond yield. They reflect no firm-specific adjustments and none of the other adjustments, modifications or uplifts that independent experts apply. Thus, they are immune from the AER's points about firm-specific adjustments.[35]

55 Two methods have been proposed for allocating some of these additional adjustments to the MRP (with the remainder being allocated to other WACC parameters) – the NERA and EY approaches. HoustonKemp shows that the inclusion of these adjustments further increases the strength of the inverse relationship between the effective MRP and the prevailing government bond yield. For his full sample period (from 2008), a 1% fall in the 10-year government bond yield is associated with a 40 basis point increase in the effective MRP. As set out above, the evidence suggests that the propensity for independent experts to make adjustments to offset the decline in government bond yields has been larger and more pronounced since 2012.

2.5.2 The AER's interpretation of the evidence

56 In its October and November 2015 decisions, the AER compares:

a. Its allowed market return; with

b. Independent expert market returns adjusted down by the extent to which the independent expert adopted a risk-free rate above the contemporaneous government bond yield.

57 By way of one example, in its October 2012 independent expert report for Stanmore Coal, the prevailing 10-year government bond yield was 3.0%, but Lonergan Edwards adopted a risk-free rate of 4.5% to accompany its MRP estimate of 6%. Thus, Lonergan Edwards has clearly adopted a market return of 10.5%.[36] However, the AER interprets this evidence as though Lonergan Edwards had adopted a market return of 9.0%.[37] In our view, such an approach is misleading and likely to lead to erroneous conclusions.

58 The AER states that it has adopted this approach because:

> It is not clear that a difference between the valuer's risk free rate estimate and prevailing yields on Commonwealth government securities reflects an uplift to market risk premium.[38]

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[35] JEN Preliminary Decision, p. 3-537.

[36] 4.5% + 6.0%.

[37] 3.0% + 6.0%. See JEN Preliminary Decision, Figure 3-33, p. 3-535.

[38] JEN Preliminary Decision, p. 3-538.

59 Rather than speculate about what *might be* the case, a better approach is to analyse the independent expert reports to determine what *is* the case. In the Stanmore Coal example, Lonergan Edwards stated that:

> The currently prevailing 10 year Commonwealth Government bond rate is well below historical levels and reflects, inter-alia, the weak outlook for global economic growth (and its impact on the outlook for the Australian economy) and the effect of quantitative easing measures by major overseas central banks. At the same time credit spreads have generally increased to offset the impact of the lower risk-free rate. Accordingly, in our view the application of current (low) government bond yields and long-term average market risk premiums is inappropriate in the context of determining long-term required equity rates of return (discount rates). As it is difficult to reliably measure short-term movements in the market risk premium we have therefore increased the risk-free rate for the purpose of estimating required equity rates of return only.[39]

60 In our view, it is very clear from this quote that the independent expert has adopted a market return of 10.5% and it is quite wrong to interpret that report as adopting a market return of 9.0%, as the AER has done.

61 Other independent expert reports make similar statements. For example, the Ernst & Young expert report for MacMahon Holdings states that:

> We believe that the current risk free rate (usually estimated with reference to the 10 year Government bond rate) is at historically low levels. Most market observers regard this as inconsistent with current share prices, the observed volatility in markets and general economic uncertainty. In response, many valuers have either used a normalised risk free rate, increased their estimates of the market risk premium or have included an additional risk factor in their calculations of the cost of equity. Our preference is to normalise the risk free rate to best reflect the longer term position.[40]

62 The Grant Thornton expert report for oOh!media Group Limited states that:

> Given the current volatility in the global economy due to the uncertainty associated with European debt markets, we have observed the yield on the 10 year Australian Commonwealth Government Bond over a longer period. Based on the average yield for the period 1 January 2011 to 12 December 2011, we have adopted risk free rate of 5% [relative to a 10-year government bond yield of 3.7% at the end of December 2011].[41]

2.5.3 Conclusions from independent expert evidence

63 The AER's approach is to estimate the risk-free rate using the contemporaneous yield on 10-year government bonds and to add a risk premium to that base. In the recent market conditions, some independent experts have increased their estimate of the MRP and others have used an estimate of the risk-free rate that sits above the contemporaneous yield on 10-year government bonds. The end result is the same – the premium above the contemporaneous bond yield is higher. Whatever

[39] Lonergan Edwards, Independent expert report for Stanmore Coal Limited, October 2012, p. 46.

[40] Ernst & Young, Independent expert report for MacMahon Holdings, January 2013, p. 56.

[41] Grant Thornton, Independent expert report for oOh!media Group Limited, January 2012, p. 147.

method the independent experts are using, the evidence is clear – as government bond yields fall, the experts apply a higher premium.

2.6 Market practitioner evidence

2.6.1 McKinsey Inc.

64 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 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.[42]

65 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[43] ratios rise. Over the last several years of QE,[44] however, P/E ratios have remained within their long-term average range.[45]

66 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 5 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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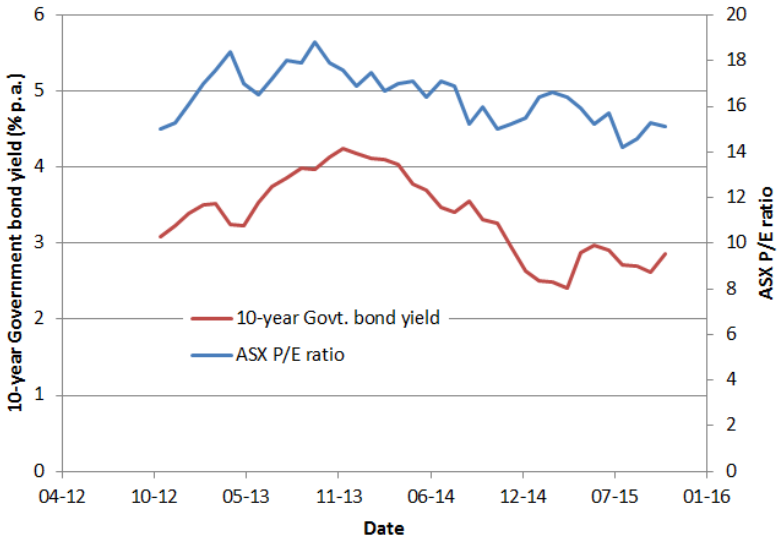
[42] Dobbs, Koller and Lund (2014), p. 17.

[43] 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).

[44] Quantitative easing is a reference to the expansive monetary policy that has been employed by many central banks since the onset of the GFC.

[45] Dobbs, Koller and Lund (2014), p. 17.

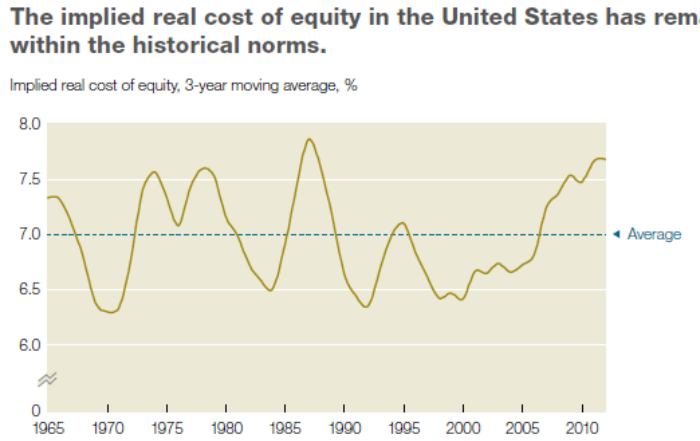
Figure 5: Australian P/E ratios and government bond yields



Source: RBA Tables f07 and f02.

67 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 6 below.

Figure 6: Implied real required return on equity



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

68 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.[46]

2.6.2 JP Morgan Corporate Finance Advisory

69 Zenner and Junac (2012), from JP Morgan, note that US government bond yields are well below historical levels, but conclude that the cost of equity has not fallen:

> So even with a relatively low Treasury rate, the currently high equity risk premium leads to a cost of equity higher than it has been historically. The cost of equity has been lower almost 68% of the time, primarily driven by a market risk premium that has been lower 97% of the time.[47]

70 That is, their conclusion is that the MRP has risen to historically high levels, fully offsetting the decline in government bond yields.

71 Zenner and Junac (2012) reach this conclusion by comparing, over time, a number of relatively simple methods for estimating the prevailing cost of equity and the prevailing equity risk premium. They do not suggest that these methods produce accurate or definitive point estimates of either. Rather, they compare current values with historical values to determine whether the current cost of equity and the current equity risk premium are likely to be high or low relative to historical levels. Their conclusion is that:

> …the equity risk premia, however estimated, have rarely been this high.[48]

2.7 Considerations of other regulators

72 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.

73 They begin with a consideration of the earlier Smithers & Co report by Wright, Mason and Miles (2003),[49] 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.

74 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

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[46] Dobbs, Koller and Lund (2014), pp. 17-18.

[47] Zenner and Junac (2012), p. 3.

[48] Zenner and Junac (2012), p. 3.

[49] Wright and Smithers (2014) refer to this earlier paper as "Mason et al."

> 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**.[50] [Emphasis added]

75 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.** [51] [Emphasis added]

76 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.[52]

77 However, FERC concluded that in the prevailing market conditions such an approach "may not produce a rational result,"[53] 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.[54]

78 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.[55]

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[50] Wright and Smithers (2014), p. 2.

[51] Wright and Smithers (2014), p. 15.

[52] FERC Opinion 531, June 2014, Paragraph 159.

[53] FERC Opinion 531, June 2014, Paragraph 159.

[54] FERC Opinion 531, June 2014, Paragraph 160.

[55] FERC Opinion 531, June 2014, Paragraph 158.

79 Similarly, 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.[56]

80 The ERA selected a higher estimate of the MRP by giving material weight to the Wright approach and DGM estimates.

81 In addition, IPART applies a default 50% weight to forward-looking estimates of the MRP – primarily a number of DGM specifications.[57] In its most recent update, IPART adopts a contemporaneous MRP of 7.9%.[58]

2.8 Evidence from debt risk premiums

82 In its October and November 2015 decisions, the AER states that:

> …although the risk free rate has recently declined, debt risk premiums have also decreased over the past year.[59]

83 This claim is inconsistent with the evidence. Table 3 below sets out the 10-year government bond yield, the RBA estimate of the debt risk premium and the RBA estimate of the 10-year corporate bond yield as at November 2014 (the time of the AER's draft decisions) and October 2015 (the time of the AER's preliminary decisions) for both A-rated and BBB-rated non-financial corporate bonds.

Table 3: RBA estimates of debt risk premiums and yields

	Risk-free rate	A DRP	A yield	BBB DRP	BBB yield
Nov 2014	3.02%	1.69%	4.72%	2.34%	5.36%
Oct 2015	2.61%	2.13%	4.74%	2.78%	5.39%

Source: RBA Table F03, Columns O, Q, AJ, AL.

84 Table 3 shows that the 10-year government bond yield has declined by approximately 40 basis points and that the RBA's estimate of the DRP has increased by approximately 40 basis points, for both A-rated and BBB-rated corporate bonds, leaving the overall yield effectively unchanged. This is exactly consistent with the AER's DGM estimates of the equity risk premium.

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[56] ERA, ATCO Gas Final Decision, Paragraph 1173.

[57] IPART, Review of WACC Methodology, December 2013.

[58] IPART, WACC Biannual update, August 2015.

[59] JEN Preliminary Decision, p. 3-534.

85 We also compare RBA estimates of debt risk premiums and yields that correspond to the periods that the AER has used to estimate the MRP using its DGM approach. Specifically, the AER's November 2014 draft decisions used an estimation period of August-September 2014, and the AER's October 2015 draft decisions used an estimation period of July-August 2015. The results are set out in Table 4 below.

Table 4: RBA estimates of debt risk premiums and yields

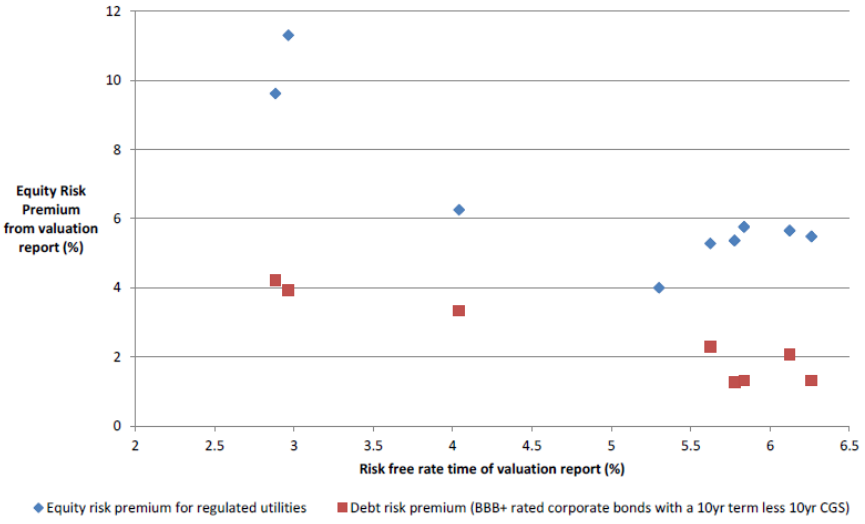
AER decision	Period	Risk-free rate	A DRP	A yield	BBB DRP	BBB yield
Nov 2014 draft decisions	Aug-Sep 2014	3.39%	1.39%	4.79%	2.08%	5.47%
Oct 2015 preliminary decisions	Jul-Aug 2015	2.71%	1.98%	4.69%	2.44%	5.15%

Source: RBA Table F03, Columns O, Q, AJ, AL.

86 Table 4 shows that the 68 basis point decline in government bond yields has been almost completely offset for A-rated bonds and largely offset for BBB-rated bonds.

87 Consistent with this evidence, in its VDPR preliminary decisions, the AER noted that the equity and debt risk premiums that independent experts applied in their consideration of regulated utilities both tended to increase materially as government bond yields fall, as summarised in Figure 7 below.

Figure 7: Equity and debt risk premiums used by independent experts for regulated utilities



Source: JEN Preliminary Decision, Figure 3-32, p. 3-534.

2.9 Conclusions in relation to evidence from the prevailing market conditions

88 In our view, the weight of this evidence in relation to the MRP in the prevailing market conditions is entirely consistent with the AER's own DGM and Wright evidence (which the AER has not given any real weight to):

a. The required return on the market has remained relatively stable over the last year or two; and

b. The MRP has increased to offset the material decline in the risk-free rate over that period.

3 Conclusions on matters set out in the terms of reference

89 Our terms of reference set out a number of specific questions for us to consider. In this section, we draw together the relevant material from this report and provide specific answers to each of those questions.

Consider the factors that have caused government bond yields to decline since December 2013 and whether those factors also affected the required return on equity over this period

90 The Australian 10-year government bond yield has fallen from 4.2% at the time of the AER's 2013 Guideline to 2.76% in its October 2015 decisions. This represents a decline of over a third. Given a relatively constant supply of government bonds, yields fall when an increasing demand pushes prices higher. Thus, government bond yields fall when investors are so keen to hold safe and liquid government bonds that they are willing to accept lower returns.

91 In a recent speech, Governor of the Reserve Bank Glenn Stevens suggested that government bond yields are at historical lows due to the unprecedented monetary easing of central banks:

> Central bank balance sheets in the three large currency areas have expanded by a total of about US$5½ trillion since 2007, and the ECB and Bank of Japan will add, between them, about another US$2½ trillion to that over the next couple of years…The direct effect of this unprecedented monetary easing has been to lower whole yield curves to extraordinarily low levels, and that process is continuing.[60]

92 This implies that part of the explanation for the decline in government bond yields is that they are "artificially" low due to central bank intervention.

93 Other contributing factors to the decline in government bond yields might include expectations of low inflation, concerns about future economic growth and the sustainability of a recovery in the US economy, and a shortage in the global supply of government bonds as government debt is being reduced from the record levels observed in the wake of the GFC.[61]

94 Guy Debelle, Deputy Governor of the Reserve Bank, has recently stated that:

> One possible contributor to the decline in yields has been concerns about the global growth outlook, but expectations for global growth over the medium term haven't changed all that much. Secular stagnation is also another popular explanation as lower real growth implies lower real yields (although I am more

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[60] Stevens (2015), p. 2.

[61] See for example, comments from AMP Chief Economist Shane Oliver at http://www.ampcapital.com.au/article-detail?alias=/olivers-insights/february/why-are-bond-yields-so-low, and

> optimistic about the world than the one this theory implies). Yields may also have been influenced by the prospective reduced supply of government bonds: the gradual improvement in governments' fiscal positions is reducing funding needs and government bond issuance. At the same time, the quantitative easing programs of the ECB and the BoJ have also worked to increase actual and anticipated demand for bonds, and there is increased demand from banks to hold sovereign debt to meet liquidity requirements.[62]

95 Debelle (2015) goes on to conclude that the biggest contributor to the decline in yields is the demand/supply imbalance. Australia has a low ratio of government debt to GDP, whereas there is substantial demand for Australian government bonds from foreign investors and banks (who require high quality liquid assets to meet new banking regulations). Debelle states that:

> …one potential explanation that I have only briefly discussed above is that yields are being held down by a shortage of risk-free assets as demand for these assets has increased. I find this explanation of increased demand for such assets in the face of slower growth in the supply to be the most plausible.[63]

96 In relation to demand from offshore investors, Debelle (2015) notes that:

> The vast majority of the post-crisis CGS issuance has been purchased by non-residents attracted to the Australian Government's AAA credit rating and favourable level of yield relative to other highly rated sovereign issuers.[64]

97 In relation to demand from Australian banks, Debelle (2015) notes that:

> …since 2007 there has been a marked increase in the share held by banks in Australia. This is a consequence of banks' desire to hold more high quality liquid assets (HQLA) in the aftermath of the global financial crisis and, more recently, the Liquidity Coverage Ratio (LCR) prudential requirements that came into effect in Australia at the beginning of 2015.[65]

98 The key question is whether:

a. The factors that have led to a reduction in government bond yields have also led to a reduction in the returns that equity holders require; or

b. The returns required by equity investors have remained stable, being relatively unaffected by the factors that have led to a reduction in government bond yields.

99 Some of the factors considered above appear to be unique to the government bond market. For example, banking regulations increase the demand for government bonds but not equity, and the demand from foreign investors has been much more pronounced in the government bond market than the equity market.

100 Ultimately, the question of whether the factors that have led to the decline in government bond yields have also had an effect on the required return on equity

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[62] Debelle (2015), pp. 3-4.

[63] Debelle (2015), p. 5.

[64] Debelle (2015), p. 7.

[65] Debelle (2015), p. 9.

is an empirical question. As set out in Section 2 above, the evidence suggests that the required return on equity has remained stable and has not fallen in lockstep with the decline in government bond yields. That evidence includes:

a. The analysis of earnings yields and hurdle rates presented in the Stevens speech and the conclusion from that speech 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.[66]

b. The evidence from HoustonKemp (2016) that independent valuation experts have generally departed from the practice of estimating the required return as the contemporaneous government bond yield plus a fixed risk premium, applying some form of upward adjustment. This empirical evidence is supported by explanations from the independent experts, such as the following:

   The currently prevailing 10 year Commonwealth Government bond rate is well below historical levels and reflects, inter-alia, the weak outlook for global economic growth (and its impact on the outlook for the Australian economy) and the effect of quantitative easing measures by major overseas central banks. At the same time credit spreads have generally increased to offset the impact of the lower risk-free rate. Accordingly, in our view the application of current (low) government bond yields and long-term average market risk premiums is inappropriate in the context of determining long-term required equity rates of return (discount rates).[67]

c. The McKinsey analysis of price/earnings ratios that leads to the conclusion that:

   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.[68]

d. The JPMorgan analysis of the implied required return on equity that leads to the conclusion that:

   So even with a relatively low Treasury rate, the currently high equity risk premium leads to a cost of equity higher than it has been historically. The cost of equity has been lower almost 68% of the time, primarily driven by a market risk premium that has been lower 97% of the time.[69]

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[66] Glenn Stevens, Speech to the Australian American Association, New York, 21 April 2015.

[67] Lonergan Edwards, Independent expert report for Stanmore Coal Limited, October 2012, p. 46.

[68] Dobbs, Koller and Lund (2014), pp. 17-18.

[69] Zenner and Junac (2012), p. 3.

e. The evidence that the yields on corporate debt have remained stable between the AER's November 2014 and October 2015 decisions, even though the yield on government bonds has fallen materially.

f. The practice of other regulators and the analysis of their advisors, leading to conclusions such as:

> …there is no empirical basis for the assumption that falls in risk-free rates should translate to falls in expected market returns. [70]

101 In our view, there is a body of evidence to support the conclusion that the factors that have led to a material decline in government bond yields since the December 2013 Guideline have not caused a lock-step reduction in the required return on equity, which has remained relatively stable.

Consider how current market conditions compare to average market conditions and what this means for how the required return on equity should be estimated in the prevailing market conditions

102 The obvious difference between the prevailing market conditions and the average historical market conditions is that government bond yields are currently at historical lows. Consequently, if the required return on equity is estimated as the prevailing government bond yield plus a constant risk premium (as the AER has done in every one of its decisions since the Guideline), the result is an estimate of the required return on equity that is also at historical lows. However, the body of evidence set out above supports the conclusion that the required return on equity is not currently at historical lows, but rather has remained relatively stable. Consequently, the AER approach of applying a fixed risk premium produces estimates that are inconsistent with this body of evidence.

103 In our view, the AER's approach of applying a fixed risk premium should be replaced with an approach of estimating a risk premium that is commensurate with the prevailing conditions in the market. This approach consistently combines estimates of the risk-free rate and MRP that both reflect the same prevailing conditions in the market.

104 In this regard, we note that the AER's own DGM estimates of the MRP (which are based exclusively on current market data and not long-run historical averages) implies that the required return on equity has remained relatively stable since the 2013 Guideline – that the MRP has increased to offset the fall in government bond yields.

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[70] Wright and Smithers (2014), p. 15.

Consider whether it is appropriate to assume that the required return on equity moves one-for-one with changes in CGS yields

105 For the reasons set out above, our view is that it is not appropriate to assume that the required return on equity moves in lockstep with changes in government bond yields, or (equivalently) that the MRP is a fixed constant.

Consider whether it is appropriate to estimate the required return on equity using an MRP estimate that reflects average market conditions over a long historical period

106 The mean historical excess returns estimate of the MRP reflects the average market conditions over the historical period that was used. In our view, this is relevant information that should form part of the evidence that is considered when selecting a final estimate of the MRP. This estimate would receive material weight if the prevailing market conditions were similar to the average historical market conditions.

107 However, the prevailing market conditions are currently materially dissimilar to the average historical conditions in that government bond yields are at historical lows. A technique that estimates the MRP by subtracting the average government bond yield from the average market return may produce a reasonable estimate of the prevailing MRP when the current government bond yield is near its historical average. However, that is not the case at present.

108 Moreover, if the MRP is estimated as the long-run mean of historical excess returns, it will remain effectively constant over time – as only one additional data point is produced each year. Such a constant estimate of the MRP inevitably produces estimates of the required return on equity that move in lockstep with changes in government bond yields. For the reasons set out above, our view is that such a lock-step estimate is inconsistent with the evidence.

4 The AER's approach to estimating the MRP

4.1 The prospect of change under the new Rules

109 In its Guideline materials, the AER raised the possibility that its approach under the new Rules might lead to more stable estimates of the allowed return on equity. However, as set out below, the AER's implementation of its approach under the new Rules is the same as under the previous Rules in that the allowed return on equity moves one-for-one with changes in the risk-free rate. In this sub-section, we review the AER's statements about the benefits of a more stable allowed return on equity and the process by which that might be achieved.

110 In its Guideline materials, the AER summarised the potential benefits of more stability in allowed returns:

> In our consultation paper, we stated that a relatively stable regulatory return on equity would have two effects:
>
> - It would smooth prices faced by consumers.
> - It would provide greater certainty to investors about the outcome of the regulatory process.[71]

111 The AER also noted that:

> Submissions in response to our draft guideline were also broadly supportive of stability.[72]

112 The AER went on to explain the process by which its allowed return on equity might become more stable under the new Rules:

> …the DGM and the Wright approach (for implementing the Sharpe–Lintner CAPM) will result in estimates of the return on equity that may be relatively stable over time. The informative use of these implementations of the Sharpe–Lintner CAPM, in addition to the DGM and other information, is expected to lead to more stable estimates of the return on equity than under our previous approach. The extent of this stability will depend on:
>
> - the extent to which movements in the estimates of the risk free rate and market risk premium in the foundation model offset each other
> - the informative value provided by the DGM and Wright approach (and other information that provides relatively stable estimates of the return on equity).[73]

113 In the subsequent sub-sections, we summarise the AER's DGM and Wright estimates and review how the AER has assessed that evidence and used it in setting allowed returns.

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[71] AER Rate of Return Guideline, Explanatory Statement, pp. 65-66.

[72] AER Rate of Return Guideline, Explanatory Statement, pp. 65-66.

[73] AER Rate of Return Guideline, Explanatory Statement, p. 66.

4.2 The AER's use of its DGM and Wright evidence

4.2.1 The AER's approach has resulted in a fixed MRP of 6.5%

114 In its Rate of Return Guideline, the AER stated that it would have regard to the DGM and Wright evidence, which:

> …is expected to lead to more stable estimates of the return on equity than under our previous approach.[74]

115 As set out above, the AER's own DGM and Wright evidence is that, between its November 2014 draft decisions and its October and November 2015 preliminary decisions:

a. The required return on the market portfolio remained constant; and

b. The material decline in the risk-free rate over that period was offset by an increase in the MRP.

116 However, the AER has given no weight to that evidence in its October and November 2015 decisions. Rather, the AER has:

a. Materially reduced its estimate of the required return on the market; by

b. Adding a fixed constant MRP of 6.5% to the now lower estimate of the risk-free rate.

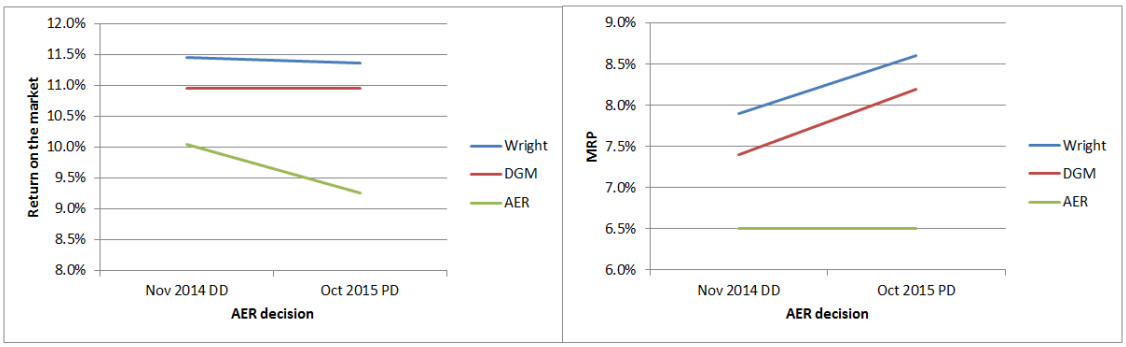
117 The AER's DGM and Wright evidence is contrasted with the AER's actual allowances in Figure 8 below, which shows that:

a. Whereas the AER's Wright and DGM evidence indicate that the required return on the market remained stable between its November 2014 and October 2015 decisions, the AER materially reduced its allowance; and

b. Whereas the AER's Wright and DGM evidence indicate that the MRP increased materially between its November 2014 and October 2015 decisions, the AER maintained a constant (materially lower) allowance.

[74] AER Rate of Return Guideline, Explanatory Statement, p. 66.

Figure 8: AER estimates vs. AER allowances



Source: AER draft decisions (Nov 2014), AER final and preliminary decisions (Oct 2015).

118 In its Rate of Return Guideline the AER stated 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…
>
> For example, Dimson, Marsh and Staunton suggest there are 'good reasons to expect the equity premium to vary over time'…Similarly, McKenzie and Partington suggest the fundamental determinants of the risk premium may change over time and, therefore, the market risk premium changes.[75]

119 As set out above, the AER's own evidence suggests that the MRP has indeed varied over time since the December 2013 Guideline and further since its November 2014 draft decisions. The AER's DGM and Wright evidence all suggests that the MRP has increased materially, offsetting the decline in government bond yields over the same period.

120 However, the AER has maintained a fixed constant MRP of 6.5% throughout. Indeed, the AER has adopted the same 6.5% MRP in every one of its draft, preliminary and final decisions under the new Rules.

121 The 6.5% estimate comes from the AER's analysis of the mean excess market return averaged over a decades-long historical period. This estimate will obviously be effectively constant from one year to the next as the addition of one observation to an already large sample will have very little impact on the mean.

122 The AER's approach has been to set the MRP in all of its decisions to 6.5% based on the long-run historical mean excess return. The fact that the AER's own DGM and Wright evidence indicates that the prevailing MRP has varied materially since its December 2013 Guideline has had no impact on the AER's 6.5% estimate of the MRP. Thus, the AER says that it has regard to its DGM and Wright evidence, but the regard that the AER has given its DGM and Wright estimates has not had any impact on its allowed MRP.

[75] AER Rate of Return Guideline, Explanatory Statement, p. 91.

4.2.2 The AER's approach to evidence from the Wright approach

123 The AER correctly recognises that the Wright approach implies a negative relationship between the risk-free rate and the MRP such that the required real return on equity is relatively stable over time.[76] The AER then argues that it should place relatively little weight on its Wright estimates because "the empirical evidence [of such a negative relationship] is not compelling."[77]

124 In our view, there are a number of problems with the AER's effective rejection of its own estimates from the Wright approach:

a. The AER provides no indication of *why* it considers the evidence to be less than compelling or of what evidence it would consider to be compelling.[78]

   As set out in Section 2.3 above, UK regulators and their advisers have reached the opposite conclusion to the AER and give material weight to the Wright approach when estimating the MRP and the ERA has conducted its own statistical tests and concluded that the results justify the application of material weight to the Wright approach.

b. In effectively disregarding its Wright and DGM evidence, the AER is left to rely on its mean historical excess returns estimate of 6.5%. This estimate is made on the basis that the MRP is constant over time even as the prevailing market conditions change. This gives rise to two problems:

   i. The assumption that the MRP is constant is directly inconsistent with the AER's own view (and that of its advisors) that "the MRP likely varies over time."[79] If the AER is of the view that the MRP changes over time as the prevailing market conditions change, it makes little sense to estimate the MRP based on the assumption that the MRP is constant over all market conditions and to effectively disregard estimates that do allow for the MRP to change over time; and

   ii. In our view, a reasonable and balanced approach would be to weigh the evidence in support of the Wright approach (i.e., evidence of stable real returns and of a negative

[76] JEN Preliminary Decision, p. 3-86.

[77] JEN Preliminary Decision, p. 3-86.

[78] The AER simply notes that Handley (October 2014) states that the evidence is not compelling (JEN Preliminary Decision, p. 3-88). Handley provides no indication of why he has reached that decision or of what sort of evidence he would consider to be "compelling."

[79] AER Rate of Return Guideline, Explanatory Statement, p. 91.

relationship between risk-free rates and the MRP) against the evidence in support of the mean historical excess returns approach (i.e., evidence of a constant MRP across all market conditions and of a required return on equity that rises and falls one-for-one with changes in the risk-free rate).

However, the AER does not do this. Rather, the AER concludes that the evidence in support of the Wright approach is not compelling and therefore sets the MRP to the mean historical excess return without any consideration of whether there is any evidence to support that approach.

In our view, a more reasonable approach (which we have previously recommended to the AER)[80] is to accept that the Wright and historical excess returns approaches each represent the ends of a theoretical spectrum and that both approaches should be given material weight on the basis that the truth is likely to lie somewhere inside these two end points.[81] However, the AER has adopted one of the end points on the basis of an assertion that the evidence to support the other end point is not sufficiently compelling.

c. In our view, the most important problem is that the AER has asked the wrong question here. The AER has effectively disregarded the Wright evidence because it considers that the long-run historical evidence of a negative relationship between the risk-free rate and MRP is not sufficiently compelling. However, the proper question is whether there is such a negative relationship in the *prevailing* market conditions. As set out throughout this report, the evidence from the AER and a range of other sources strongly suggests that there *is* such an inverse relationship in the prevailing market conditions, or that the prevailing MRP is currently above its long-term average.

4.2.3 The AER's approach to evidence from the DGM

125 The AER states that its DGM estimate is given the "second most reliance" when estimating the MRP.[82] As set out above, the AER's dividend discount (or DGM) estimates of MRP have increased materially since the Guideline and are now well above the 6.5% estimate from historical excess returns. However, the AER has maintained its MRP point estimate at 6.5% throughout. This is consistent with the

[80] SFG (2014 Equity), SFG (2015 Equity).

[81] Moreover, the point within the spectrum the best reflects the contemporaneous market risk premium is likely to vary as the prevailing market conditions change.

[82] JEN Preliminary Decision, p. 3-89.

6.5% upper bound serving as a maximum that cannot be exceeded even as the weight of relevant evidence evolves.

126 The AER specifically notes that it has not made any material changes to its approach for estimating the MRP in response to the AEMC's 2013 rule changes. For example, in relation to the APA GasNet decision made under the previous Rules, the AER now states:

> The Australian Competition Tribunal upheld our approach to estimating the MRP when APA GasNet appealed our decision in 2013. The MRP approach brought before the Australian Competition Tribunal was similar to that applied in this decision.[83]

127 We note that the approach that the AER adopted under the previous Rules has never led to the AER ever adopting an MRP above 6.5%. Even at the height of the GFC and European debt crisis, the allowed MRP never exceeded 6.5%. This is consistent with the 6.5% figure being a "cap" for the allowed MRP under the previous Rules. It follows that if the approach under the current Rules is not materially different, the 6.5% cap would remain in place.

128 That is, if the AER's approach (which is substantially the same before and after the 2012 rule changes) does not allow an MRP above 6.5% during a once-in-a-generation financial crises, it seems clear that it will *never* allow an MRP above 6.5%.

129 In this regard, the AER's own dividend discount estimates indicate that the MRP has increased materially since its Guideline and even since its November 2014 draft decisions. This increase in the MRP would offset much of the effect of falling government bond yields and produce some stability in the allowed return on equity. However, the AER now discounts that evidence, concluding that it will have much less regard to its own dividend discount evidence when government bond yields are very low or very high.[84] That is, in just the scenarios where the dividend discount evidence could have a stabilising effect on the allowed return on equity, the AER will have less regard to it.

130 The AER's reasons for disregarding its own DGM evidence (or, equivalently, having regard to the DGM evidence in such a way as it has no perceptible effect on its MRP allowance) are, in our view, fraught with problems. Most of the AER's reasons are based on theoretical possibilities raised by Partington and Satchell (October 2015), who do not investigate whether the possible issues do, in fact, arise in the prevailing market conditions:

a. Partington and Satchell correctly note that it is theoretically possible that an individual firm might borrow to maintain its current dividend in the short term, but that proves to be unsustainable in the long-run, at which point the dividend might be reduced and the dividend growth rate would be negative in that year. However, the AER applies the DGM only at the market-wide

[83] JEN Preliminary Decision, p. 3-115.

[84] JEN Preliminary Decision, Attachment 3, Appendix B, Section B.5.

level. Neither the AER nor Partington and Satchell provide any evidence that firms, on average across the economy, are currently borrowing in order to maintain unsustainable dividends. Rather, the evidence suggests the opposite. An examination of the top 20 firms (which collectively account for approximately half of the total ASX market capitalisation) indicates that analysts are anticipating increasing dividends and earnings. The market capitalisation weighted average increase in forecasted earnings per share from 2015 to 2017 is 19%. This evidence is inconsistent with the proposition that firms might (on average) be borrowing in an unsustainable manner to temporarily maintain dividends at their current levels.[85]

b. Partington and Satchell also correctly note that, in theory, it is possible that firms maintain their current dividends in the short run even though profits are expected to fall in the future. This would also suggest that the current level of dividends could not be sustained. Again, neither the AER nor Partington and Satchell provide any evidence that this theoretical possibility is actually occurring across all stocks in the current market conditions. In fact, the empirical evidence is that it is not. The strong growth in forecasted earnings per share suggests the opposite of the potential problem that Partington and Satchell have raised.

c. Partington and Satchell raise the possibility that analyst forecasts are upwardly biased – that earnings forecasts are, on average, higher than what actual earnings turn out to be. There are three problems with this argument:

    i. No reason has been presented for why this effect would be stronger in the current market conditions than it was at the time of the Guideline. Thus, it does not explain why the AER has apparently reduced the weight it applies to its DGM estimates over time (i.e., the AER's DGM estimates have increased materially since its Guideline, but the AER has made no change to its MRP estimate);

    ii. Any such bias is unlikely to have a material effect. To see this, note that the AER's most recent DGM estimate of the required return on the market is 10.96%.[86] In the simplest form of DGM (to keep this illustrative calculation as simple as possible) we have:

$$r_m = \frac{d}{P} + g = 6.36\% + 4.6\% = 10.96\% .$$

[85] See http://www.4-traders.com/stock-exchange/shares/Oceania-7/Australia-147/,%20http://www.marketindex.com.au/asx20.

[86] 2.96% + 8.2%, where growth is set at 4.6%.

If dividends, including imputation credits, was over-estimated by 5%, the "true" required return on the market would be:

$$r_m = 0.95 \times 6.36\% + 4.6\% = 10.64\%.$$

We note that even this significant bias in dividend forecasts results in only a 30 basis point differential in the estimate of the required return on the market, which is economically small.

The AER examines the effect of a 10% reduction in forecasted dividends and reports that its DGM estimate of the MRP would fall by 65 basis points from 8.17% to 7.52%,[87] still materially above the AER's allowed MRP of 6.5%; and

iii. Even if analyst forecasts *are* somewhat biased on average, it is those forecasts that should be used to derive the implied discount rate (return on the market) that the analysts are using;[88]

d. The AER considers the possibility that there may be a term structure of required returns on the market whereby investors require a relatively lower return over the next ten years and then a relatively higher return in subsequent years.[89] The AER recognises that (a) it is not clear how such a term structure would possibly be estimated and that (b) in practice a term structure is not used when implementing the DGM.[90]

131 In our view, it is unreasonable for the AER to have effectively disregarded its own DGM estimates on the basis of theoretical possibilities without examining the evidence, which indicates that the potential problems that have been raised are not relevant in the prevailing market conditions.

4.2.4 Summary and conclusions in relation to the AER's approach

132 The AER's own Wright and DGM estimates indicate that the market risk premium has increased materially since its December 2013 Guideline. However, the AER has maintained a fixed MRP of 6.5% in every one of its draft, preliminary and final decisions since the Guideline. Whether the AER has disregarded this evidence, or

[87] JEN Preliminary Decision, Table 3-45, p. 3-366.

[88] That is, analysts will value stocks as the present value of their forecasted dividends, so to derive the implied discount rate that the analysts are using, one would need to use the forecasted dividends that the analysts are using.

[89] JEN Preliminary Decision, Attachment 3, Section B.2.3.

[90] JEN Preliminary decision, p. 3-340.

had regard to it in a way that has no effect on its MRP allowance, the outcome is the same. Our view is that this is relevant evidence that should receive material weight in the AER's MRP allowance, whereas to date it has not.

133 If the AER adopted the approach of applying real weight to its own Wright and DGM estimates, the result would be more stable estimates of the allowed return on equity over time. In our view, this would be consistent with the actual returns that investors require and it would also be in the long-term interests of consumers (other things being equal) to have less volatility in allowed returns.

134 We conclude this section by noting that the AER made these very points in its Rate of Return Guideline materials. However, the AER's decisions since its Guideline have applied no real weight to its DGM and Wright estimates. Rather, the AER's estimate of the MRP has remained constant throughout despite the AER's own DGM and Wright estimates indicating material increases in the MRP.

135 The AER's approach of adding a constant fixed MRP to the prevailing government bond yield produces a yo-yo effect in its allowed return on equity. Thus, the benefits of more stability in the allowed return on equity that were foreshadowed in the AER's Guideline have proved to be illusory in practice, as illustrated in Figure 2 above.

5 Declaration

136 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.

6 References

Australian Energy Market Commission, 2012, *Rule determination: National Electricity Amendment (Economic regulation of network service providers) Rule 2012 and National Gas Amendment (Economic regulation of gas services) Rule 2012,* November.

Australian Energy Regulator, 2015, *Final decision for TransGrid Transmission 2015-16 to 2018-18, Attachment 3 – Rate of return,* April.

Australian Energy Regulator, 2014, *Draft decision, Jemena Gas Networks (NSW) Ltd Access Arrangement 2015–20,* November.

Australian Energy Regulator, 2013, *Rate of return guideline,* December.

Australian Energy Regulator, 2013, *Rate of return guideline – Explanatory Statement,* December.

Debelle, G., 2015, *Global and domestic influences on the Australian bond market*, KangaNews Debt Capital Markets Summit, 16 March.

Dobbs, R., T. Koller, and S. Lund, 2014, "What effect has quantitative easing had on your share price?" *McKinsey on Finance*, 49, 15-18.

Ernst & Young, 2013, *Independent expert report for MacMahon Holdings*, January.

ERA, 2015, *Final Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution Systems*, 30 June.

Federal Energy Regulatory Commission, 2014, *Opinion 531*, June.

Grant Thornton, 2012, *Independent expert report for oOh!media Group Limited*, January.

Handley, J., 2014, *Advice on the return on equity*, Report for the AER, 16 October.

HoustonKemp, 2016, *The cost of equity: response to the AER's draft decisions for the Victorian electricity distributors*, January.

IPART, 2013, *Review of WACC methodology*, December.

IPART, 2015, *WACC biannual update*, August.

Lonergan Edwards, 2012, *Independent expert report for Stanmore Coal Limited*, October.

Partington, G. and S. Satchell, 2015, *Analysis of criticisms of 2015 determinations*, Report for the AER, October.

SFG Consulting, 2015, *The required return on equity for the benchmark efficient entity*, February.

SFG Consulting, 2014, *The required return on equity for regulated gas and electricity network businesses*, June.

Stevens, G., 2015, *The world economy and Australia*, Address to the American Australian Association, 21 April.

Wright, S., R. Mason and D. Miles, 2003, *A study into certain aspects of the cost of capital for regulated utilities in the UK*, Report for UK economic regulators and the Office of Fair Trading, 13 February.

Wright, S. and A. Smithers, 2015, *The cost of equity capital for regulated companies: A review for Ofgem*, www.ofgem.gov.uk/ofgem-publications/86100/wrightsmithersequitymarketreturn.pdf.

Zenner, M. and E. Junek, 2012, "Musings on low cost of debt and high risk premia," JP Morgan Corporate Finance Advisory.

7 Appendix 1: Instructions

Expert Terms of Reference

The relationship between government bond yields and the market risk premium

Jemena Electricity Networks (Vic) Limited
2016-20 Electricity Distribution Price Review

EDPR-5700-0011

Version B – 5 January 2016

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1 Background

Jemena Electricity Networks (**JEN**) is an electricity distribution network service provider in Victoria. JEN supplies electricity to approximately 300,000 homes and businesses through its 10,285 kilometres of distribution system. JEN's electricity distribution system services 950 square kilometres of northwest greater Melbourne. JEN's electricity network is maintained by infrastructure management and services company, Jemena Asset Management (**JAM**).

JEN submitted its initial regulatory proposal with supporting information for the consideration of the Australian Energy Regulator (**AER**) on 30 April 2015. This proposal covers the period 2016-2020 (calendar years). The AER published its preliminary determination on 29 October 2015. JEN is currently preparing its submission in response to the preliminary decision, to be submitted to the AER by 6 January 2016.

As with all of its economic regulatory functions and powers, when making the distribution determination to apply to JEN under the National Electricity Rules and National Electricity Law, the AER is required to do so in a manner that will or is likely to contribute to the achievement of the National Electricity Objective, which is:

> *to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to:*
>
> *(a) price, quality, safety, reliability and security of supply of electricity; and*
>
> *(b) the reliability, safety and security of the national electricity system.*

The equivalent National Gas Objective is set out in section 23 of the National Gas Law.

Where the AER is making a distribution determination and there are two or more possible decisions that will or are likely to contribute to the achievement of the National Electricity Objective, the AER is required to make the decision that the AER is satisfied will or is likely to contribute to the achievement of the National Electricity Objective to the greatest degree.

The AER must also take into account the revenue and pricing principles in section 7A of the National Electricity Law when exercising its discretion in making those parts of a distribution determination relating to direct control network services. The revenue and pricing principles include the following:

> *A regulated network service provider should be provided with a reasonable opportunity to recover at least the efficient costs the operator incurs in:*
>
> *(a) providing direct control network services; and*
>
> *(b) complying with a regulatory obligation or requirement or making a regulatory payment.*

The equivalent revenue and pricing principles for gas network regulation are set out in section 24 of the National Gas Law.

Some of the key rules governing the making of a distribution determination are set out below.

Clause 6.4.3(a) of the National Electricity Rules provides that revenue for a regulated service provider is to be calculated adopting a "building block approach". It provides:

> *The annual revenue requirement for a Distribution Network Service Provider for each regulatory year of a regulatory control period must be determined using a building block approach, under which the building blocks are:*
>
> *(1) indexation of the regulatory asset base – see paragraph (b)(1);*
>
> *(2) a return on capital for that year – see paragraph (b)(2);*
>
> *(3) the depreciation for that year – see paragraph (b)(3);*
>
> *(4) the estimated cost of corporate income tax of the Distribution Network Service Provider for that year – see paragraph (b)(4);*
>
> *(5) the revenue increments or decrements (if any) for that year arising from the application of any efficiency benefit sharing scheme, capital expenditure sharing scheme, service target performance incentive scheme, demand management and embedded generation connection incentive scheme or small-scale incentive scheme – see subparagraph (b)(5);*
>
> *(6) the other revenue increments or decrements (if any) for that year arising from the application of a control mechanism in the previous regulatory control period – see paragraph (b)(6);*
>
> *(6A) the revenue decrements (if any) for that year arising from the use of assets that provide standard control services to provide certain other services – see subparagraph (b)(6A); and*
>
> *(7) the forecast operating expenditure for that year – see paragraph (b)(7).*

Clause 6.5.2 of the National Electricity Rules, relating to the allowed rate of return, states:

> *Calculation of return on capital*
>
> *(a) The return on capital for each regulatory year must be calculated by applying a rate of return for the relevant Distribution Network Service Provider for that regulatory year that is determined in accordance with this clause 6.5.2 (the allowed rate of return) to the value of the regulatory asset base for the relevant distribution system as at the beginning of that regulatory year (as established in accordance with clause 6.5.1 and schedule 6.2).*
>
> *Allowed rate of return*
>
> *(b) The allowed rate of return is to be determined such that it achieves the allowed rate of return objective.*
>
> *(c) The allowed rate of return objective is that the rate of return for a Distribution Network Service Provider is to be commensurate with the efficient financing costs of a*

benchmark efficient entity with a similar degree of risk as that which applies to the Distribution Network Service Provider in respect of the provision of standard control services (the allowed rate of return objective).

(d) Subject to paragraph (b), the allowed rate of return for a regulatory year must be:

(1) a weighted average of the return on equity for the regulatory control period in which that regulatory year occurs (as estimated under paragraph (f)) and the return on debt for that regulatory year (as estimated under paragraph (h)); and

(2) determined on a nominal vanilla basis that is consistent with the estimate of the value of imputation credits referred to in clause 6.5.3.

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

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

(2) the desirability of using an approach that leads to the consistent application of any estimates of financial parameters that are relevant to the estimates of, and that are common to, the return on equity and the return on debt; and

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

Return on equity

(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.

Return on debt

(h) The return on debt for a regulatory year must be estimated such that it contributes to the achievement of the allowed rate of return objective.

(i) The return on debt may be estimated using a methodology which results in either:

(1) the return on debt for each regulatory year in the regulatory control period being the same; or

(2) the return on debt (and consequently the allowed rate of return) being, or potentially being, different for different regulatory years in the regulatory control period.

(j) *Subject to paragraph (h), the methodology adopted to estimate the return on debt may, without limitation, be designed to result in the return on debt reflecting:*

(1) *the return that would be required by debt investors in a benchmark efficient entity if it raised debt at the time or shortly before the making of the distribution determination for the regulatory control period;*

(2) *the average return that would have been required by debt investors in a benchmark efficient entity if it raised debt over an historical period prior to the commencement of a regulatory year in the regulatory control period; or*

(3) *some combination of the returns referred to in subparagraphs (1) and (2).*

(k) *In estimating the return on debt under paragraph (h), regard must be had to the following factors:*

(1) *the desirability of minimising any difference between the return on debt and the return on debt of a benchmark efficient entity referred to in the allowed rate of return objective;*

(2) *the interrelationship between the return on equity and the return on debt;*

(3) *the incentives that the return on debt may provide in relation to capital expenditure over the regulatory control period, including as to the timing of any capital expenditure; and*

(4) *any impacts (including in relation to the costs of servicing debt across regulatory control periods) on a benchmark efficient entity referred to in the allowed rate of return objective that could arise as a result of changing the methodology that is used to estimate the return on debt from one regulatory control period to the next.*

(l) *If the return on debt is to be estimated using a methodology of the type referred to in paragraph (i)(2) then a resulting change to the Distribution Network Service Provider's annual revenue requirement must be effected through the automatic application of a formula that is specified in the distribution determination."*

[Subclauses (m)–(q) omitted].

The equivalent National Gas Rules are set out in rule 87.

Clause 6.5.3 of the National Electricity Rules, relating to the estimated cost of corporate income tax, states:

The estimated cost of corporate income tax of a Distribution Network Service Provider for each regulatory year (ETCt) must be estimated in accordance with the following formula:

$$ETCt = (ETIt \times rt)(1 - \gamma)$$

where:

ETIt is an estimate of the taxable income for that regulatory year that would be earned by a benchmark efficient entity as a result of the provision of standard control services if such an entity, rather than the Distribution Network Service Provider, operated the business of the Distribution Network Service Provider, such estimate being determined in accordance with the post-tax revenue model;

rt is the expected statutory income tax rate for that regulatory year as determined by the AER; and

γ is the value of imputation credits.

The equivalent National Gas Rule is in rule 87A.

In its initial proposal, JEN submitted several expert reports of SFG (the **Earlier Reports**) on the appropriate approach to be adopted in estimating the return on equity for the benchmark efficient entity.[1] The AER preliminary decision considered these reports.

In this context, JEN seeks a report from Frontier Economics, as a suitably qualified independent expert (**Expert**), that reviews and, where appropriate, responds to matters raised in the preliminary decision on the relationship between government bond yields and the market risk premium and required return on equity. JEN seeks this report on behalf of itself, ActewAGL Distribution, Ausnet Services, Australian Gas Networks, Citipower, Powercor, and United Energy.

2 Scope of Work

In its preliminary determination, the AER uses a 20 business day average of yield on Commonwealth Government securities (**CGS**) to estimate the return on equity for the benchmark efficient entity. The AER added this average to the product of a 6.5% market risk premium (**MRP**) and a 0.7 equity beta to estimate this return.

The Expert will provide an opinion report that:

1. Reviews movements in CGS yields since December 2013 and considers the factors that have contributed to the pattern of CGS yields since this time and whether these factors are also likely to have impacted upon the required return on equity over this period, considering (among other relevant information):

   (a) statements and analysis provided by the Reserve Bank of Australia; and

[1] *SFG*, 25 February 2015, *The required return on equity for the benchmark efficient entity*; *SFG*, 13 February 2015, *Beta and Black CAPM Asset Pricing Model*; *SFG*, 27 March 2015, *The foundation model approach of the Australian Energy Regulator to estimating the cost of equity*; *SFG*,13 February 2015, *Using the Fama-French model to estimate the required return on equity*; *SFG*, 18 February 2015, *Share prices, the dividend discount model and the cost of equity for the market and a benchmark energy network*.

(b) previous analysis of CGS yields by other experts, including SFG and Competition Economists Group.

2. Considers how current market conditions (that is, market conditions prevailing in November and December 2015) compare to average market conditions and any implications arising from this comparison for the required return on equity over the next 10 years.

3. In light of the Expert's opinion on the above matters, and any other matters the Expert considers relevant, concludes whether it is appropriate to use the Sharpe-Lintner Capital Asset Pricing Model in the way that the AER has to estimate the return on equity and, in particular, to adopt an approach that uses a fixed or relatively inflexible market risk premium parameter.

In preparing the report the Expert will:

A. consider the theoretical and empirical support for the factors and conditions identified;

B. consider any relevant comments raised by the AER and other regulators, and experts engaged by those regulators; and

C. use robust methods and data in producing any statistical estimates.

3 Information to be Considered

The Expert is also expected to consider the following information:

- such information that, in Expert's opinion, should be taken into account to address the questions outlined above;
- relevant literature on estimating the return on equity;
- the AER's Rate of Return Guideline, including explanatory statements and supporting expert material;
- material submitted to the AER as part of its consultation on the Rate of Return Guidelines; and
- previous decisions of the AER, other relevant regulators and the Australian Competition Tribunal on the return on equity and any supporting expert material, including the recent final decisions for Jemena Gas Networks and electricity networks in ACT, NSW, Queensland, South Australia and Tasmania.

4 Deliverables

At the completion of its review the Expert will provide an independent expert report which:

- is of a professional standard capable of being submitted to the AER;

- is prepared in accordance with the Federal Court Practice Note on Expert Witnesses in Proceedings in the Federal Court of Australia (CM 7) set out in Attachment 1, and includes an acknowledgement that the Expert has read the guidelines [2];

- contains a section summarising the Expert's experience and qualifications, and attaches the Expert's curriculum vitae (preferably in a schedule or annexure);

- identifies any person and their qualifications, who assists the Expert in preparing the report or in carrying out any research or test for the purposes of the report;

- summarises JEN's instructions and attaches these term of reference;

- includes an executive summary which highlights key aspects of the Expert's work and conclusions; and

- (without limiting the points above) carefully sets out the facts that the Expert has assumed in putting together his or her report, as well as identifying any other assumptions made, and the basis for those assumptions.

The Expert's report will include the findings for each of the five parts defined in the scope of works (Section 2).

5 Timetable

The Expert will deliver the final report to Jemena Regulation by **6 January 2016**.

6 Terms of Engagement

The terms on which the Expert will be engaged to provide the requested advice shall be:

- as provided in accordance with the Jemena Regulatory Consultancy Services Panel arrangements applicable to the Expert.

[2] Available at: http://www.federalcourt.gov.au/law-and-practice/practice-documents/practice-notes/cm7.

ATTACHMENT 1: FEDERAL COURT PRACTICE NOTE

Practice Note CM 7

EXPERT WITNESSES IN PROCEEDINGS IN THE FEDERAL COURT OF AUSTRALIA

Commencement

1. This Practice Note commences on 4 June 2013.

Introduction

2. Rule 23.12 of the Federal Court Rules 2011 requires a party to give a copy of the following guidelines to any witness they propose to retain for the purpose of preparing a report or giving evidence in a proceeding as to an opinion held by the witness that is wholly or substantially based on the specialised knowledge of the witness (see **Part 3.3 - Opinion** of the *Evidence Act 1995* (Cth)).

3. The guidelines are not intended to address all aspects of an expert witness's duties, but are intended to facilitate the admission of opinion evidence[3], and to assist experts to understand in general terms what the Court expects of them. Additionally, it is hoped that the guidelines will assist individual expert witnesses to avoid the criticism that is sometimes made (whether rightly or wrongly) that expert witnesses lack objectivity, or have coloured their evidence in favour of the party calling them.

Guidelines

1. General Duty to the Court[4]

1.1 An expert witness has an overriding duty to assist the Court on matters relevant to the expert's area of expertise.

1.2 An expert witness is not an advocate for a party even when giving testimony that is necessarily evaluative rather than inferential.

1.3 An expert witness's paramount duty is to the Court and not to the person retaining the expert.

2. The Form of the Expert's Report[5]

2.1 An expert's written report must comply with Rule 23.13 and therefore must

(a) be signed by the expert who prepared the report; and

(b) contain an acknowledgement at the beginning of the report that the expert has read, understood and complied with the Practice Note; and

(c) contain particulars of the training, study or experience by which the expert has acquired specialised knowledge; and

(d) identify the questions that the expert was asked to address; and

(e) set out separately each of the factual findings or assumptions on which the expert's opinion is based; and

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[3] As to the distinction between expert opinion evidence and expert assistance see *Evans Deakin Pty Ltd v Sebel Furniture Ltd* [2003] FCA 171 per Allsop J at [676].

[4] The "*Ikarian Reefer*" (1993) 20 FSR 563 at 565-566.

[5] Rule 23.13.

(f) set out separately from the factual findings or assumptions each of the expert's opinions; and

(g) set out the reasons for each of the expert's opinions; and

(ga) contain an acknowledgment that the expert's opinions are based wholly or substantially on the specialised knowledge mentioned in paragraph (c) above[6]; and

(h) comply with the Practice Note.

2.2 At the end of the report the expert should declare that "[the expert] has *made all the inquiries that* [the expert] *believes are desirable and appropriate and that no matters of significance that* [the expert] *regards as relevant have, to* [the expert's] *knowledge, been withheld from the Court*."

2.3 There should be included in or attached to the report the documents and other materials that the expert has been instructed to consider.

2.4 If, after exchange of reports or at any other stage, an expert witness changes the expert's opinion, having read another expert's report or for any other reason, the change should be communicated as soon as practicable (through the party's lawyers) to each party to whom the expert witness's report has been provided and, when appropriate, to the Court[7].

2.5 If an expert's opinion is not fully researched because the expert considers that insufficient data are available, or for any other reason, this must be stated with an indication that the opinion is no more than a provisional one. Where an expert witness who has prepared a report believes that it may be incomplete or inaccurate without some qualification, that qualification must be stated in the report.

2.6 The expert should make it clear if a particular question or issue falls outside the relevant field of expertise.

2.7 Where an expert's report refers to photographs, plans, calculations, analyses, measurements, survey reports or other extrinsic matter, these must be provided to the opposite party at the same time as the exchange of reports[8].

3. Experts' Conference

3.1 If experts retained by the parties meet at the direction of the Court, it would be improper for an expert to be given, or to accept, instructions not to reach agreement. If, at a meeting directed by the Court, the experts cannot reach agreement about matters of expert opinion, they should specify their reasons for being unable to do so.

J L B ALLSOP
Chief Justice
4 June 2013

[6] See also *Dasreef Pty Limited v Nawaf Hawchar* [2011] HCA 21.

[7] The *"Ikarian Reefer"* [1993] 20 FSR 563 at 565

[8] The *"Ikarian Reefer"* [1993] 20 FSR 563 at 565-566. See also Ormrod *"Scientific Evidence in Court"* [1968] Crim LR 240

8 Appendix 2: Curriculum vitae – Professor Stephen Gray

Stephen Gray is Professor of Finance at the University of Queensland Business School and Chairman of Frontier Economics (Australia). He has Honours degrees in Commerce and Law from the University of Queensland and a PhD in financial economics from the Graduate School of Business at Stanford University.

In his university role, he teaches a range of award and executive education courses in financial management, asset valuation, and corporate finance. He has received a number of teaching awards, including a national award for university teaching in the field of business and economics. He has published widely in highly-ranked journals and has received a number of manuscript awards, most notably at the *Journal of Financial Economics*.

Stephen is also an active consultant to industry on issues relating to valuation, cost of capital, and corporate financial strategy. He has acted as a consultant to many of Australia's leading companies, government-owned corporations, and regulatory bodies. His clients include the Independent Pricing and Regulatory Tribunal (IPART), Australian Competition and Consumer Commission (ACCC), Melbourne Water, Qantas, Telstra, Origin Energy, AGL, Foxtel, ENERGEX, Queensland Treasury Corporation, Rio Tinto Alcan and the Australian Securities and Investments Commission (ASIC). Projects include corporate cost of capital reviews, asset valuation, independent valuation of executive stock options, and the assessment of capital structure and financing strategies.

He has also appeared as an independent expert in several court proceedings relating to the valuation of assets and businesses and the quantification of damages.

Key experience

Cost of capital

Energy sector

- **TransGrid (2015) –** Advised the electricity transmission operator in NSW on the appropriateness of the Australian Energy Regulator's (AER's) proposed transitional arrangements before the full introduction of a trailing average approach to setting the cost of debt allowance for regulated networks. The AER recently revised its rate of return methodology. In doing so, the AER announced that it would adopt a trailing average approach to setting cost of debt allowances (similar to the approach used by Ofgem in Great Britain). However, the AER argued that it should phase this approach in to allow businesses sufficient time to align their debt management practices to the new methodology. Frontier prepared a report on behalf of TransGrid explaining

the circumstances in which such transitional arrangements would not be appropriate.

- **Australian Energy Markets Commission (AEMC) (2012)** – The regulator (AER) and a group of large energy users (EURCC) proposed changes to the National Electricity Rules and National Gas Rules (Rules). The AEMC, which is the government agency that is responsible for maintaining the Rules, conducted a year-long review and consultation process in relation to the proposed rule changes. Stephen was appointed to advise the AEMC on rate of return issues. His role involved the provision of advice to the AEMC secretariat and board, the preparation of a number of public reports, the co-ordination and chairing of public hearings, and a series of one-on-one meetings with key stakeholders. The process resulted in material changes being made to the Rules, with revised Rules being published in November 2012.

- **Energy Networks Association (2013) –** The National Electricity Rules and National Gas Rules (Rules) require the regulator to publish a series of regulatory guidelines every three years. The Australian Energy Regulator (AER) conducted a year-long process in 2013 that ended with the publication of its first Rate of Return Guideline. Throughout this process, Stephen advised the Energy Networks Association (ENA) on rate of return issues. This involved working with the ENA's Regulatory Affairs Committee, specialist working groups, and legal advisors, preparing expert reports, drafting submissions, and representing the ENA at stakeholder forums.

- **TransGrid (2013) Return on Debt Analysis –** The 2012 changes to the National Electricity Rules included, inter alia, a provision that permitted the allowed return on debt to be set according to a trailing average approach. TransGrid sought an analysis of the effect that such a change would have on the residual cash flows that were available to its shareholders. Stephen developed a Monte Carlo simulation model that generated many scenarios for the possible future evolution of interest rates, incorporating empirical relationships between government bond yields, credit spreads, and inflation. His analysis quantified the extent to which the trailing average approach would better match the actual cost of servicing debt under TransGrid's longstanding debt management approach, thereby reducing the volatility of the cash flow to equity holders.

- **Aurizon Network (2014) Split Cost of Capital Analysis –** In a discussion paper, the Queensland Competition Authority advocated consideration of a split cost of capital regulatory approach. Under the proposed approach the regulator would allow a standard "debt and equity" regulated return on assets during their construction, but a "100% debt" return once the asset had been included in the firm's regulatory asset base. Stephen was retained by Aurizon

(operator of a regulated coal rail network). His role was to prepare an expert report that considered the economic and financial basis for the proposed approach, and which considered the likely consequences of such an approach. After his presentation to the QCA board, the proposal was shelved indefinitely.

- **Energy Networks (2014-15) Regulatory Reviews –** Stephen has prepared expert reports and submissions on behalf of all businesses that are in the current rounds of regulatory resets. These reports cover the whole range of regulatory cost of capital issues. Clients over the last year include ATCO Gas, DBP, ActewAGL, TransGrid, Jemena, United Energy, CitiPower, Powercor, SA Power Networks, Ausgrid, Essential Energy, Endeavour Energy, ENERGEX, and Ergon Energy.

- **Legal and Appeal Work –** Stephen has assisted a number of regulated business, and their legal teams, through merits review and appeal processes. One example is the 2011 *Gamma* case in the Australian Competition Tribunal. That case involved the "gamma" parameter, which quantifies the impact that dividend imputation tax credits have on the cost of capital. The regulator (AER) proposed an estimate that was based on (a) an assumption that was inconsistent with the observed empirical evidence, and (b) a point estimate that was based partly on a paper with questionable reliability and partly on data that was irrelevant to the task at hand. Stephen's role was to prepare a series of expert reports, to assist the legal team to understand the issues in detail, and to attend the hearings to advise as the matter was heard. The end result was that the Tribunal set aside the entire basis for the AER's proposed estimate and directed us to perform a "state of the art" empirical study. Stephen performed the required study and its results were accepted in full by the Tribunal, who set the estimate of gamma on the basis of it.

Water sector

- **Melbourne Water (2015) –** In preparation for the 2016 Victorian price review, Stephen is part of the Frontier team currently advising Melbourne Water on ways in which the rate of return methodology used by the Victorian regulator, the Essential Services Commission (ESC), could be improved, and the likely revenue impact of any methodological changes. At the last (i.e. 2013) price reset, the ESC indicated that it intended to review its rate of return methodology but to date has not done so. By comparison, most other major Australian regulators have revised their methodologies significantly, in part due to recognition of the need to make their estimation approaches more resilient to the effects of global financial crises. A comparison of the methodologies used by different regulators in Australia suggests that the ESC's methodology is out of line with best regulatory practice. Frontier's advice has focused on

identifying the areas for improvement, and the development of the economic arguments that would support the case for change.

- **Unity Water, SEQ Water, Gladstone Area Water Board (2013-14) –** Stephen has prepared a series of reports for a number of Queensland water utilities. These reports include (a) a response to the QCA's (Queensland regulator) proposed split cost of capital approach (which has now been shelved indefinitely), and (b) a response to the QCA's proposed cost of capital estimates.

Telecommunications sector

- **NBN Co (2012-13) –** Stephen advised NBN Co on a range of cost of capital issues in relation to their proposed special access undertaking. This work included the drafting of expert reports, meetings with and presentations to various NBN Co committees and working groups, and representing NBN Co in discussions with the regulator (ACCC). Key issues included the length of the proposed access arrangement, the extent to which higher risk during the construction and proof-of-concept phases justified a higher allowed return, and the process by which early year losses might be capitalized into the regulatory asset base.

- **C7 Case (2006-07), Federal Court of Australia**

  The Seven Network brought an action against a number of Australian media and entertainment firms in relation to the abandonment of its cable TV business, C7. Seven alleged that the respondents colluded to prevent C7 from securing the rights to broadcast AFL and NRL matches and that this prevented its C7 business from being economically viable.

  Stephen was retained by a group of respondents including PBL, Telstra, and News Corporation. His role was to address various matters relating the quantification of damages. He prepared several reports, was involved in several discussions with other valuation expert witnesses, and was cross examined in the Federal Court.

  The Court found in favour of the respondents.

Transport sector

- **CBH Group (2015) –** Stephen was part of the Frontier team that developed, on behalf of CBH (a major Australian grain producer and access seeker to rail infrastructure in Western Australia) and its legal counsel, a submission to the Economic Regulation Authority (ERA) of Western Australia on the regulator's approach to estimating WACC. The submission focused on, amongst other issues, the ERA's approach to estimating the market risk premium, the estimation approach to beta, and the way in which the WACC

ought to be used within the negotiate-arbitrate arrangements within the rail access regime.

- **Brockman Mining Australia (2015) –** Stephen was part of the Frontier team that advised Brockman, a potential access seeker to rail infrastructure in Western Australia, on its submission to the Economic Regulation Authority (ERA) of Western Australia in relation to the ERA's approach to WACC under the Railways (Access) Code 2000. Subsequently, the ERA released a Revised Draft Decision on its proposed WACC methodology. Frontier was engaged again by Brockman to help develop its submission to the ERA on the Revised Draft Decision. The submissions focused on the appropriateness of the beta estimates proposed by the ERA, the methodology used to estimate the market risk premium (and consistency between the methodologies used by the ERA in different sectors), the appropriateness of the ERA's credit rating assumption for the benchmark efficient entity (which affects the cost of debt allowance under the ERA's methodology).

- **Brookfield Rail (2014) –** The WA Railways (Access) Code requires railway operators to provide certain information to access seekers to enable them to compute "floor" and "ceiling" prices as defined in the Code. Brookfield provided access seekers with certain information and other relevant information was available from public sources. Stephen prepared an expert report that considered whether the information available to an access seeker, together with specialist assistance from relevant experts, would be sufficient to compute floor and ceiling prices.

- **Brisbane Airport Corporation (2013-14) –** Stephen was engaged by Brisbane Airport Corporation (BAC) to advise on a range of regulatory and cost of capital issues in relation to the development of the airport's new parallel runway (NPR). BAC identified the need for an additional runway to accommodate steadily increasing demand. The development of a new runway required a large capital commitment ($1.5 billion) and would take approximately eight years to complete. BAC proposed that the airlines would contribute to the financing of the NPR during construction – the alternative being the capitalisation of a return on capital expenditure until completion and a sharp spike in landing fees when the NPR become operational. One of the key issues in the negotiations with airlines was the WACC that would be used to determine the return on capital. Stephen's role was twofold. He produced an expert report providing a strong basis for BAC's proposed WACC. He also advised BAC on the likely approach of the ACCC (the regulator in question) should they become involved – the regulatory arrangements provide for the parties to negotiate a commercial outcome and for the regulator to become involved if they are unable to do so. BAC was successful in their negotiations with the relevant airlines and the NPR is now under construction.

- **Abbott Point Coal Terminal (2014) –** Stephen was engaged by a consortium of mining companies in relation to arbitration with Adani, the owner and operator of the Abbott Point Coal Terminal. The parties had in place a user agreement that was similar to a regulatory-style building block model. Stephen advised on a range of cost of capital and other issues including detailed reports on the cost of debt and the level of corporate costs.

Financial litigation support

- **APLNG (2014-15)**
  The Australia-Pacific LNG (APLNG) project is a joint venture between Origin Energy, ConocoPhillips and Sinopec that involves the extraction of coal seam methane and processing into liquefied natural gas (LNG) for export. The relevant Queensland royalties legislation provides that a 10% royalty is to be levied on the value of the gas at the first point of disposal. Since the project is integrated from end-to-end, there is no arm's length price at the relevant point. Stephen was retained by APLNG to prepare an expert report on the process for determining what the arm's length price at the first point of disposal would be if such a thing existed. This involves estimating the costs, including a fair return on capital, for a hypothetical upstream gas producer and a hypothetical downstream LNG operator, and allocating any excess profit between the parties.

- **CDO Case (2013)**
  This case involved a class action against the Australian distributor of collateralised debt obligations (CDOs) and the international credit ratings agency that assigned credit ratings to them. The CDOs in question were financial products with a payoff that depended on the number of defaults (or "credit events") among a reference set of 150 different corporate bonds issued by companies in different industries and different geographical locations. A typical CDO structure would involve the investor being repaid all of their initial investment plus an attractive rate of interest so long as there were less than say 7 defaults out of the reference set of 150 bonds during the five-year life of the CDO. However, if there were say 11 or more defaults, the investor would lose their entire investment. If the number of defaults was between 7 and 11, the return to the investor would be proportional (e.g., 8 defaults would involve a 25% loss of principal).

  The CDOs in question were created by US investment banks and were distributed in Australia by a large Australian commercial bank. One of the key issues in the case was whether the Australian distributor made proper disclosures about risk to investors, which included individuals, self-managed superannuation funds, and local councils. The CDOs in question were assigned strong investment grade credit ratings by an international ratings agency. The process used to assign those ratings did not properly take into

account the correlation between defaults – the empirical fact that during recessions and financial crises many bonds default at the same time.

Stephen's role was to prepare an expert report that explained to the Court how CDOs were structured, how they operated, and what risks were involved. His report also examined the risk disclosures that were contained in the materials that were provided to potential investors and the process by which the credit rating agency assigned ratings.

- **Wright Prospecting litigation (2012-14)**
  Wright Prospecting Pty Ltd (WPPL) is involved in several legal disputes about the payment of royalty streams in relation to iron ore and coal mining operations. WPPL had assigned various rights and licenses in relation to iron ore mines in WA and coal mines in Queensland to other parties, in return for royalties on the revenues received from the sale of the ore. Stephen's role was to prepare a series of expert reports quantifying the present value of the royalty streams.

- **Public Trustee of QLD v. Octaviar Ltd (2009), Supreme Court of Queensland**
  The Octaviar Group (formerly the MFS Group) is a Gold Coast based group of listed companies with funds management and leisure services businesses. Octaviar was unable to refinance a loan in early 2008 and sought to raise equity via a rights issue as part of a substantial corporate restructure. The stock price fell some 70% on this announcement and Octaviar subsequently sold a 65% interest in its leisure business known as Stella. Octaviar then sought to make arrangements with its creditors, including the Public Trustee, as trustee for note holders.

  Stephen was retained by the Public Trustee. His role was to prepare several reports on (a) whether the companies in the Octaviar Group were insolvent, (b) the date the companies became insolvent, and (c) whether the note holders would be made better or worse off by the proposed arrangement, relative to a liquidation. He was cross examined by four parties with an interest in these proceedings on issues relating to the date of the insolvency.

- **Telstra v. ACCC (2008), Federal Court of Australia**
  Telstra brought an action against the ACCC in relation to access charges that Telstra was allowed to charge its retail competitors for access to its fixed line and broadband networks – arguing that the return on capital allowed by the ACCC was unreasonably low.

Stephen was retained by Telstra. His role was to prepare several reports on the issue of whether the ACCC has been inconsistent in its application of valuation methods – in a way that reduced Telstra's allowed return. He was also involved in several discussions with other valuation expert witnesses, prepared a joint statement of experts, and was cross examined in the Federal Court individually and in a "hot tub" setting.

- **Alcan Northern Territory Alumina Pty Ltd v. Commissioner of Taxes (2006-07), Supreme Court of Northern Territory**
  First Engagement: Consulting Expert

Alcan bought out the equity of its joint venture partner in a combined bauxite mine and alumina refinery in the Northern Territory. The NT Revenue Authority claimed that the transaction was caught by the NT "land rich" provision, under which the transaction would be subject to stamp duty if more than 60% of the consideration was attributable to land assets.

The key economic issue is the apportionment of value between the mine (predominately land assets) and the refinery (substantially intangible assets arising out of intellectual property and expertise).

Stephen was retained by Alcan as consulting experts. Their role was to prepare a range of financial models and analysis to support the view that a substantial portion of the value of the transaction was attributable to non-land assets in the refinery. This involved complex financial modelling and market analysis. A full integrated model was produced, allowing users to select whether they preferred the appellant's or respondent's submission on each input parameter, and automatically re-calculating the land-rich ratio.

Stephen worked closely with Alcan's legal team, Counsel, and various independent experts. Stephen assisted the legal team during the trial and in preparing sections of final submissions.

Second Engagement: Independent Expert

The initial judgment contained findings about certain matters and was sent back to the Commissioner for re-assessment. A dispute arose between the parties about the effect of the judgment. In particular, the value of a primary 10-year lease had to be disaggregated from the value of an option to continue the project.

Stephen was retained by Alcan to produce an expert valuation report that addressed the matters in dispute. Two expert reports were prepared and Stephen was cross-examined on this material. Stephen prepared an easy to use spreadsheet calculator to assist the Court in testing how different input assumptions (where the experts could not agree) affected the bottom line. This was used by His Honour as an *aide memoire* and was considered to be particularly helpful in the case in terms of simplifying the effects of a number of complex matters.

Judgment was in favour of Alcan. Stephen's evidence was accepted and endorsed by the Court.

Career: Professional

2014-Present	Chair, Frontier Economics
1997-2014	Director, SFG Consulting

Career: Academic

2000 - Present	Professor of Finance, UQ Business School, University of Queensland
1997-1999	Associate Professor of Finance, UQ Business School, University of Queensland
1997-2001	Research Associate Professor of Finance, Fuqua School of Business, Duke University
1995-1997	Assistant Professor of Finance, Fuqua School of Business, Duke University

Education

1987	Bachelor of Commerce (Hons), University of Queensland
1989	Bachelor of Laws (Hons), University of Queensland
1995	PhD, Stanford University

Papers and publications: Cost of capital

- Gray, S. and J. Nowland, 2015, "The Diversity of Expertise on Corporate Boards in Australia," *Accounting and Finance*, forthcoming.
- Darat, A., S. Gray, J. C. Park and S. Wu, (2014), "Corporate governance and bankruptcy risk" *Journal of Accounting, Auditing and Finance,* forthcoming.

- Gray, S., I. Harymawan and J. Nowland, (2014), "Political and government connections on corporate boards in Australia: Good for business?" *Australian Journal of Management,* forthcoming.
- Brailsford, T., S. Gray and S. Treepongkaruna, (2013), "Explaining the bid-ask spread in the foreign exchange market: A test of alternate models," *Australian Journal of Management*, forthcoming.
- Faff, R., S. Gray and M. Poulsen, (2013), "Financial inflexibility and the value premium," *International Review of Finance*, forthcoming.
- T. Fitzgerald, S. Gray, J. Hall and R. Jeyaraj, (2013), "Unconstrained estimates of the equity risk premium" *Review of Accounting Studies,* 18, 560-639.
- Feuerherdt, C., S. Gray and J. Hall, (2010), "The Value of Imputation Tax Credits on Australian Hybrid Securities," *International Review of Finance*, 10, 3, 365-401.
- Gray, S., J. Hall, D. Klease and A. McCrystal, (2009), "Bias, stability and predictive ability in the measurement of systematic risk," *Accounting Research Journal*, 22, 3, 220-236.
- Costello, D., S. Gray, and A. McCrystal, (2008), "The diversification benefits of Australian equities," *JASSA*, 2008, 4, 31-35.
- Gray, S. and J. Hall, (2008), "The Relationship Between Franking Credits and the Market Risk Premium: A Reply," *Accounting and Finance*, 48, 1, 133-142.
- Gray, S., A. Mirkovic and V. Ragunathan, (2006), "The Determinants of Credit Ratings: Australian Evidence," *Australian Journal of Management*, 31(2), 333-354.
- Choy, E., S. Gray and V. Ragunathan, (2006), "The Effect of Credit Rating Changes on Australian Stock Returns," *Accounting and Finance*, 46(5), 755-769.
- Gray, S. and J. Hall, (2006), "The Relationship Between Franking Credits and the Market Risk Premium," *Accounting and Finance*, 46(3), 405-428.
- Cannavan, D., F. Finn and S. Gray, (2004), "The Value of Dividend Imputation Tax Credits in Australia," *Journal of Financial Economics*, 73, 167-197.
- Dahlquist, M. and S. Gray, (2000), "Regime-Switching and Interest Rates in the European Monetary System," *Journal of International Economics*, 50(2), 399-419.
- Bollen, N., S. Gray and R. Whaley, (2000), "Regime-Switching in Foreign Exchange Rates: Evidence from Currency Options," *Journal of Econometrics*, 94, 239-276.
- Bekaert, G. and S. Gray, (1998), "Target Zones and Exchange Rates: An Empirical Investigation," *Journal of International Economics*, 45(1), 1-35.

- Gray, S. (1996), "Modeling the Conditional Distribution of Interest Rates as a Regime- Switching Process," *Journal of Financial Economics*, 42, 27-62.
- Gray, S. (1996), "Regime-Switching in Australian Interest Rates," *Accounting and Finance*, 36(1), 65-88.

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