The required return on equity: Response to AER Victorian Gas Draft Decisions

Report for APA GasNet, Envestra, Multinet and SP AusNet

7 November 2012

SFG CONSULTING
Level 1, South Bank House
Cnr. Ernest and Little Stanley St
South Bank, QLD 4101

PO Box 29
South Bank, QLD 4101

Email: s.gray@sfgconsulting.com.au
Office: +61 7 3844 0684
Phone: +61 419 752 260

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1. Background and conclusions

Instructions

1. SFG Consulting (**SFG**) has been retained by APA GasNet, Envestra, Multinet and SP Ausnet to provide advice in relation to the regulatory market risk premium (**MRP**) for use in the Capital Asset Pricing Model (**CAPM**).

2. We have been asked to specifically address the issues relating to MRP that have been raised in a number of recent regulatory determinations and consultant reports:

    a) The AER's Final Decision, APT Petroleum Pipeline Pty Ltd Access Arrangement Roma to Brisbane Pipeline 2012–13 to 2016–17, August 2012 (**RTB Final Decision**);

    b) The AER's Draft Decisions for Victorian gas businesses, September 2012 (**Victorian Gas Draft Decisions**). These Draft Decisions relate to the following businesses:

        i) APA GasNet[1];

        ii) Envestra (Albury)[2];

        iii) Multinet Gas[3]

        iv) Envestra (Victoria)[4]; and

        v) SP AusNet[5].

    c) McKenzie and Partington, Report for the AER, *Equity Market Risk Premium*, December 21 2011 (**McKenzie and Partington (2011)**);

    d) McKenzie and Partington, Report for the AER, *Supplementary Report on the Equity Market Risk Premium*, February 22 2012 (**McKenzie and Partington (2012)**); and

    e) Lally, Report for the AER, *The Cost of Equity and the Market Risk Premium*, July 25 2012 (**Lally (2012)**).

3. A copy of our instructions is attached as an appendix to this report.

Declarations

4. This report has been authored by Professor Stephen Gray, Professor of Finance at the University of Queensland Business School and Director of SFG Consulting (SFG), a corporate finance consultancy specialising in valuation, regulatory and litigation support advice. I have attached a copy of my CV as an appendix to this report.

[1] Access arrangement draft decision, APA GasNet Australia (Operations) Pty Ltd, 2013–17, Part 1, September 2012, Australian Energy Regulator.
[2] Access arrangement draft decision, Envestra Ltd, 2013–17, Part 1, September 2012, Australian Energy Regulator.
[3] Access arrangement draft decision, Multinet Gas (DB No. 1) Pty Ltd, Multinet Gas (DB No. 2) Pty Ltd, 2013–17, Part 1, September 2012, Australian Energy Regulator.
[4] Access arrangement draft decision, Envestra Ltd, 2013–17, Part 1, September 2012, Australian Energy Regulator.
[5] Access arrangement draft decision, SPI Networks (Gas) Pty Ltd, 2013–17, Part 1, September 2012, Australian Energy Regulator.

5. For the purposes of preparing this report I was provided with a copy of the Federal Court Practice Note CM7 *Expert Witnesses in Proceedings in the Federal Court of Australia* dated 1 August 2011. I have reviewed those guidelines and this report has been prepared consistently with the form of expert evidence required by those guidelines. In preparing this report, 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 report.

Professor Stephen Gray

Summary of conclusions

Core reasoning

6. The requirement in the present case is to determine an estimate of the required return on equity for a benchmark efficient gas distribution or transmission company that is commensurate with the prevailing conditions in the market for funds consistent with r. 87 of the National Gas Rules (**NGR**).

7. In its recent decisions, the AER has adopted a market risk premium of 6%. This is the same estimate as the AER had adopted prior to the global financial crisis (**GFC**). This estimate, given the analysis and justifications set out in the AER's current and previous decisions, is based primarily on estimates of the mean of historical excess returns. An estimate based on a long-term historical average will (obviously) reflect the average of the conditions in the market for funds that applied during the relevant historical period.

8. The AER then combines its estimate of MRP (based on a long-term historical average) with a contemporaneous estimate of the risk-free rate (which is currently at historical lows) to produce its estimate of the required return on equity. The result is an estimate of the required return on equity that is also at historical lows.

9. Consequently, the central question is whether or not the AER's approach to estimating these two parameters has produced an estimate of the required return on equity that is commensurate with the prevailing conditions in the market for funds. The AER considers that it does – that required returns on equity are presently lower than at any time since records have been kept. Its rationale for this conclusion is that:

    a) A contemporaneous estimate of the risk-free rate reflects the prevailing conditions in the market; and

    b) The AER's estimate of MRP also reflects the prevailing conditions in the market, because current equity risk premiums are commensurate with those prevailing prior to the GFC.

10. That is, the historical data used to estimate MRP reflects historical market conditions, but it will also reflect prevailing market conditions if those prevailing conditions are the same as the historical conditions. This appears to be common ground (and indeed a matter of basic logic).

11. The basis for the AER's view that the current MRP is the same as that prior to the GFC is survey data and general market commentary, with "limited weight" applied to the latter.[6]

12. For the reasons set out below, we conclude that the survey data and general market commentary on which the AER has relied should not, and cannot, be used to support the conclusion that current equity risk premiums are commensurate with those before the GFC. Our view is that not only is it wrong for the AER to have relied on that survey and commentary information, but it was also wrong to have relied *only* on that information in reaching the conclusion that the current equity risk premiums are commensurate with the conditions prior to the GFC.

13. In our view, there is substantial evidence to support the conclusion that the prevailing conditions in the market for funds (insofar as they relate to financial risk premiums) are *not* now commensurate with the conditions prior to the GFC.

14. The most compelling such evidence is the fact that the market for funds now requires materially higher risk premiums (three- or four-fold higher) when investing in debt securities. It is implausible to suggest that the same market for funds would not require higher risk premiums when investing in equity securities.

15. It is our view that the only reasonable interpretation of the empirical data is that equity risk premiums remain at elevated levels. When interpreting the data, it is important to note that, in its recent Draft Decisions, the AER does not suggest that the current required return on equity is commensurate with its long-run average. Rather, the AER proposes that the current MRP is commensurate with its long-run average. This implies that the required return on equity is currently lower than at any time on record. Consequently, the observable data would only support the return on equity that has been allowed in the Draft Decisions if it also indicated that required returns were at historical lows. In our view, no reasonable interpretation of any of the observed data would support such an interpretation.

16. It is important to note that the AER does not conclude that the prevailing conditions in the market for funds are *generally* commensurate with those prior to the GFC – only that the prevailing *required premiums on equity investments* are commensurate with those prevailing prior to the GFC. For example, the AER concludes that:

    a) Risk premiums on debt investments are now several times higher than before the GFC; and

    b) The total required return on equity is now materially lower than before the GFC, and is currently lower than at any time on record.

Implications of current AER practice for determining the allowed return on equity

17. The current practice of the AER is to determine the allowed return on equity in the benchmark firm by adding a constant premium of 4.8% to the contemporaneous estimate of the risk-free rate of interest. This approach has the following implications:

[6] Envestra Draft Decision, p. 53.

a) The AERs current estimate of the required return on equity is the lowest ever on record. That is, the AER has the view that equity investors are more prepared to make equity investments requiring lower returns than ever before;

b) Whereas debt risk premiums are currently three- to four-fold higher than pre-GFC levels (by the AER's estimates), equity risk premiums have not increased at all. That is, a market that requires a three- to four-fold increase in risk premiums when investing in debt securities in the benchmark firm, requires no additional risk premium at all when investing in riskier equity securities in the same firm;

c) A material number of investors will invest in residual equity in the benchmark firm for a premium of only 26 basis points over the return that they could receive on first-ranking investment grade debt in the same firm;

d) The benchmark firm could materially lower its cost of capital by employing 100% equity finance;

e) Investors in comparable firms can reasonably expect to receive a return that is at least 35% higher than what is being allowed to investors in the benchmark firm.

Arithmetic vs. geometric returns

18. If historical excess returns are to be used to compute the historical MRP, the estimate must be based on the arithmetic mean and not the geometric mean. This is consistent with:

a) Basic statistical principles;

b) The continuing widespread acceptance of the Harvard Case on this point;

c) The advice to the AER from Lally (2012)[7]; and

d) The advice to the AER from McKenzie and Partington (2011) regarding the use of the arithmetic mean as being the most commonly used.[8]

19. If the geometric mean is to be used:

a) McKenzie and Partington recommend that it be given a maximum of 10% weight;[9] and

b) The AER states that its estimate of MRP would be the same whether or not it gives any weight to the geometric mean.[10]

20. In our view, the geometric mean of historical excess returns should not be used and there is no reason to report it.

[7] Lally (2012), p. 5, repeated at pp. 32 and 34.
[8] McKenzie and Partington (2011), Paragraph 31.
[9] McKenzie and Partington (2011), p. 8.
[10] Envestra Draft Decision, Appendix B, p. 30. Throughout this report we cite references to the Envestra Draft Decision. The other Draft Decisions contain identical or similar statements.

Historical mean excess returns produce an estimate of MRP that is commensurate with historical conditions in the market for funds

21. There is broad agreement that the risk premiums that equity investors require vary over time. That is, the MRP is not constant, but varies over time.

22. The mean of historical excess returns is only capable of providing an estimate of the long-run average level of the MRP – commensurate with the average conditions in the market over the historical period. This does not necessarily provide a contemporaneous estimate of the MRP that is commensurate with the prevailing conditions in the market. The best illustration of this point comes from the AER's last WACC Review. It is common ground that during 2008 and early 2009 financial risk premiums increased materially. The AER specifically recognised this point in its WACC Review and accordingly increased its estimate of MRP.[11] At the same time that risk premiums were materially increasing, global stock markets plummeted. This, in turn, has the effect of reducing the historical mean of excess returns. That is, just when financial risk premiums are going up, the mean of historical excess returns is going down.

23. In general, the mean of historical excess returns moves in the opposite direction to the risk premiums that are commensurate with the prevailing conditions in the market for funds. When risk premiums rise, stock prices fall and the historical mean falls, and when risk premiums fall, stock prices rise and the historical mean rises. Consequently, the mean of historical excess returns does not provide an estimate of MRP that is commensurate with the prevailing conditions in the market for funds, but rather one that is commensurate with the average conditions in the market over the historical period.

The use of survey information and general macroeconomic commentary

24. The AER uses survey data and general macroeconomic commentary to support its conclusion that the prevailing conditions in the market for funds are commensurate with those prevailing prior to the GFC, insofar as the estimation of MRP is concerned.

25. The Tribunal recently indicated[12] that three conditions must be met for survey responses to be given any material consideration:

    a) The survey must be timely – there must have been no change in the prevailing conditions in the market for funds since the survey was administered;

    b) There must be clarity about precisely what respondents were asked so that there is no ambiguity about how to interpret their responses; and

    c) The survey must reflect the views of the market and not a sample that is small, unresponsive, or without sufficient expertise.

26. None of these requirements are met by the survey responses on which the AER has relied:

    a) Timeliness – the key feature of the prevailing conditions in the market for funds is the historically low government bond yield. The yield on 10-year government bonds is currently

[11] AER (2009), Final Decision, Electricity transmission and distribution network service providers, Review of the weighted average cost of capital (WACC) parameters, May 2009; pages 237-238. "The AER also notes that there may be an inverse relationship between the short term historical excess return and the short term forward looking MRP."
[12] Application by Envestra Ltd (No 2) [2012] ACompT 3.

around 3%. Any surveys that were administered in materially different market conditions cannot provide any estimate of the MRP that is commensurate with the prevailing conditions in the market for funds;

b) Clarity – survey responses in relation to MRP are notoriously vague and ambiguous. On this measure, survey responses could only be considered if:

   i) Respondents were asked about what they actually do, not if they were asked to predict the future;

   ii) Respondents were also asked what estimate they used for the risk-free rate;

   iii) Respondents were also asked whether they made any other adjustments to reflect current market conditions;

   iv) Respondents were also asked to set out the time horizon for which their response applies; and

   v) Respondents were also asked to specify whether their estimate of MRP was to be used in the CAPM to produce an estimate of the total required return, which would then be multiplied by $\frac{1-T}{1-T(1-\gamma)} = \frac{1-0.3}{1-0.3(1-0.25)} = 0.90$ when estimating the firm's cost of capital, consistent with the regulatory approach. This last question would determine whether respondents were reporting an MRP estimate on the same basis as that used by the AER.

   Only if all of these requirements are met will the survey response be consistent with the AER's definition and use of MRP.

c) Sample – the Tribunal requires that the weight applied to survey data must reflect the non-response rate and the expertise of the sample respondents.

27. In our view, the best information about the current conditions in the market for funds comes from current prices and practices in the market for funds, rather than from survey responses, macroeconomic commentary or outdated observations. We note that this view is consistent with the recent directions from the Tribunal.

Other regulators accept that the current historical lows in government bond yields imply that the prevailing conditions in the market for funds are not commensurate with pre-GFC conditions

28. IPART has recently concluded that "there may be an inconsistency between using short term data for the risk free rate and using long term data for the MRP…there may be an inversely proportional relationship between the MRP and the risk free rate,"[13] and that "In the current market circumstances, there is some evidence to support the view that expectations for the MRP have risen as bond yields have fallen,"[14] and further that "we recognised that there may be a discrepancy between the use of short term yields on the risk free rate and long term averages for the MRP, particularly in the current market."[15]

[13] IPART (2012), p. 107.
[14] IPART (2012), p. 107.
[15] IPART (2012), p. 107.

29. In a series of recent cases, IPART has worked within its regulatory constraints to allow a return on equity above that which would be obtained by adding a fixed premium to the government bond yield. In these cases, IPART has allowed a return on equity that is close to its long-run historical mean estimate of the required return on equity. This allowed return on equity can be obtained by:

    a) Increasing the risk free rate from the contemporaneous estimate to a longer-term average estimate of 5.2 to 5.4%; or

    b) Adopting a contemporaneous MRP estimate of 7.5 to 7.8%.

30. Application of the IPART approach would currently produce an estimate of the required return on equity of at least 10% for the benchmark firm.

The debt risk premium and the expected return on debt

31. The debt yield is a *promised* return, but the benchmark firm might default on its obligations in which case the *expected* return to debt holders in the benchmark firm might be less than what was promised. The AER has argued that this means that the DRP (which the AER has increased three- or four-fold since pre-GFC determinations) cannot be compared with the MRP (which is unchanged from pre-GFC determinations).

32. However, in the event of default the debt holders are paid less than they were promised and the equity holders receive nothing. That is, the "risk of default" can also be considered to be "the risk that the equity becomes worthless." If there is an increase in the risk of default, there is the same increase in the risk of the equity becoming worthless. If actual equity investors were told that the risk of their investment becoming worthless had increased, they would require a higher return commensurate with the higher risk. It is implausible to suggest that the required return on equity would be independent of the probability of that equity becoming worthless.

33. In its recent Draft Decisions, the AER argues that the allowed return on equity has been kept low because part of the increase in the DRP might be due to an increased risk of default.[16] That is, equity returns have been kept low because there is an increased risk of default and insolvency such that the equity becomes worthless. In our view, it defies logic to argue that the required return on equity should be lower because of an increased risk of insolvency.

34. We also show that the DRP can be high even when the probability of default is small. A relatively high DRP does not necessarily imply a high probability of default, nor a material difference between the promised yield and the expected return.

35. The regulatory argument is that the expected return on debt for the benchmark regulated firm is lower than the promised yield on debt for the benchmark regulated firm. That is, the regulator is arguing that debt investors in the benchmark firm should expect a return that is materially lower than the allowed return on debt because there is a material chance that the revenue that the regulator has allowed will be insufficient to pay what has been promised to those debt holders. However, a situation in which there is a material chance that the revenue that the regulator has allowed will be insufficient to pay what has been promised to those debt holders would seem to be inconsistent with

[16] Envestra Draft Decision; Appendix B, page 47. Lally (2012) has also explained that the cost of debt is a promised rate of return, which exceeds the expected rate of return by the expected default losses (see page 9).

the National Gas Law. [17] Consequently, the argument about material default risk would not seem to be one that is open to the regulator.

36. McKenzie and Partington and the AER correctly note that, in the context of the regulatory framework, the return on equity is an *expected* return.[18] The AER estimates that expected return using the CAPM and then sets the regulatory revenue requirement such that the benchmark firm would be able to pay that return to equity holders. However, the equity holders receive that return only so long as the regulated firm remains solvent. In the event of insolvency and default, the equity becomes worthless and the return on equity is -100%. For example, suppose the CAPM estimate of the expected return on equity is 12% and there is a 5% chance of default. In this case, the regulated firm should be allowed to charge prices that would be sufficient to provide a return to shareholders of 18%. Other things equal, shareholders would receive a return of 18% if the firm remains solvent (95% probability) and would lose their investment if it does not. Shareholders would thus face an expected return of 12%, consistent with the CAPM estimate. In summary, if the regulator considers that there is a material probability of default, then that probability should be identified so that the allowed return on equity can be appropriately grossed-up as set out above.

The AER's cross checks for reasonableness

37. The AER applies a number of cross checks for the reasonableness of its allowed regulatory WACC. Our conclusions in relation to these checks are:

    a) **Transaction multiples** are of little use because acquirers are purchasing more than a regulated revenue stream, there are few observations, and the little data that is available is out-dated. It is impossible to separate a myriad of other factors that affect valuation from the WACC;

    b) **Trading multiples** are of little use because no firm consists of a single regulated asset and equity holders in the listed comparable firms are buying more than a regulated revenue stream. It is impossible to separate a myriad of other factors that affect valuation from the WACC;

    c) **Broker WACC estimates** are all materially higher than the regulatory allowance. This does *not* confirm the reasonableness of the AER's allowed return, as the AER suggests; and

    d) **Prior regulatory decisions of the AER** are not an independent source of data, so (logically) cannot be used as a cross check for reasonableness.

38. In our view, the reasonableness and plausibility of a particular allowed return can be better assessed with reference to timely market data, particularly the return required on debt securities, and timely evidence of commercial practice including independent expert reports.

[17] For example, the National Gas Objective set out in s. 23 of the National Gas Law refers explicitly to the "long term interests of consumers" and the "security of supply of natural gas." Causing a service provider to face a material chance of insolvency is inconsistent with the long term interests of consumers and with the security of supply of natural gas.
[18] McKenzie and Partington (2012), pp. 21-23; Envestra Draft Decision, Appendix B, p. 47.

2. Is the AER's allowed return on equity commensurate with the prevailing conditions in the market for funds?

Current regulatory allowed return on equity

39. In its recent Victorian Gas Draft Decisions, the AER has used the Capital Asset Pricing Model (**CAPM**) to determine the allowed return on equity. In its Draft Decisions for APA GasNet and for the Victorian gas distribution businesses, the AER has adopted the following parameter estimates:

    a) Risk-free rate of 2.98%;

    b) Equity beta of 0.8; and

    c) Market risk premium (**MRP**) of 6%.[19]

40. These parameter estimates combine to produce an allowed return on equity of 7.78% p.a.:

$$r_e = r_f + \beta_e \times MRP$$
$$= 2.98\% + 0.8 \times 6\% = 7.78\%.$$

Current estimates imply that equity capital is now cheaper than ever before

41. Figure 1 below shows the current allowed return on equity is at its lowest level ever, materially lower than historical allowances. This figure has been constructed by applying the Sharpe-Lintner CAPM to contemporaneous regulatory estimates of the relevant parameters. In particular:

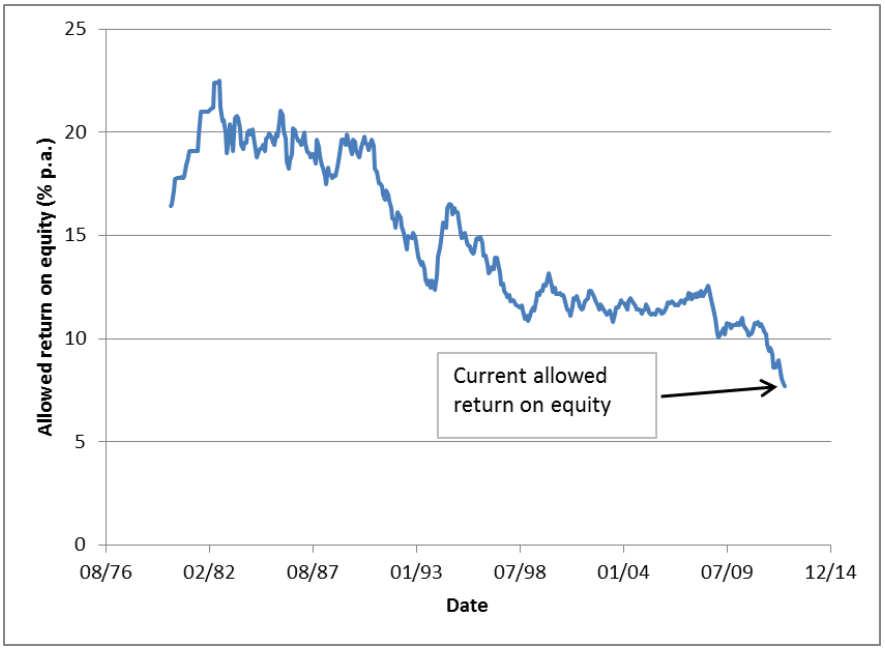
    a) The risk-free rate has been set to the yield on 10-year Commonwealth Government securities;

    b) The market risk premium has been set to 6%, other than for the period between May 2009 (AER WACC Review Final Decision) and November 2011 (Aurora Draft Decision) when it was set to 6.5%; and

    c) Equity beta has been set to 0.8 for the period after May 2009 and to 1.0 for the period prior to May 2009.

[19] Under the Sharpe-Lintner CAPM, the MRP is the difference between the expected return on the market portfolio (usually proxied by a broadly diversified portfolio of shares) and the risk-free rate.

Figure 1. Allowed return on equity under the AER approach and parameter estimates



Source: Reserve Bank of Australia, various regulatory determinations.
Estimates of the return on equity are computed as the return that the AER would have adopted if it had applied its approach to the relevant market data at the time.

42. Figure 1 above implies that equity capital is currently cheaper than at any time in the past 30 years – that investors are more prepared to make equity investments requiring lower returns than ever before.

Equity capital is not really cheaper than ever before

43. The return on equity allowed by the AER in its recent Draft Decisions implies that equity capital is now cheaper than ever before. This allowed return would only be commensurate with the prevailing conditions in the market for funds if market investors really were requiring lower returns on equity capital than ever before. But any reasonable analysis would conclude that they are not.

44. For example, Zenner and Junac (2012) note that US government bond yields are currently low, but conclude that the cost of equity is now relatively high – and certainly not the lowest on record:

> 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.[20]

45. 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

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

equity and the current equity risk premium are likely to be high or low relative to historical levels. Their conclusion is that:

> The debt risk premia (i.e., credit spreads) for both investment grade and high yield debt remain elevated relative to history. More strikingly, the equity risk premia, however estimated, have rarely been this high.[21]

46. They go on to conclude that the MRP is currently higher than in 97% of their sample period – the record highs in MRP more than counteract the record lows in government bond yields.

47. Although the Zenner and Junac analysis relates to the US market, we note that the relevant conditions are the same in the Australian financial markets – government bond yields are at historical lows and corporate debt spreads remain at elevated levels.

48. Of course this is just one example of an analysis that leads to the conclusion that equity capital in the market for funds is not cheaper than ever before, and we consider a further range of evidence below. Our point here is simply that no reasonable analysis would conclude that equity capital is now cheaper than ever before. Yet that is what the AER has concluded in its recent Draft Decisions. This goes to the issue of whether the allowed return is commensurate with the prevailing conditions in the market for funds.

49. As one further example, if the required return on equity really had fallen to its lowest level ever, one would expect to have seen a material rally in stock prices, but no such rally has occurred over the period of the decline in government bond yields.

50. In our view, it is reasonable to conclude that required returns on equity in the Australian market are *not* currently lower than at any time on the historical record.

Regulatory estimates of debt and equity risk premiums are inconsistent

51. Figure 2 below shows:

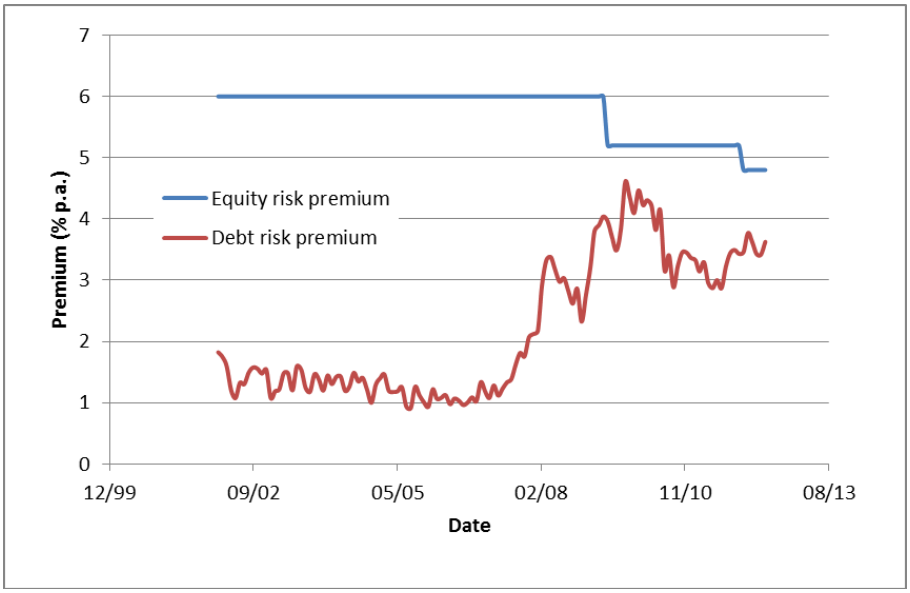
    a) the allowed regulatory equity risk premium (computed as set out in Paragraph 39 (b) and (c) above); and

    b) an estimate of debt risk premium computed as the difference between the 10-year government bond rate and the 10-year Bloomberg BBB fair value rate, where the Bloomberg fair value curve has been extrapolated as required on the basis of the Bloomberg AAA fair value curve).[22]

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

[22] We use this extrapolation method as a close approximation of the paired bonds method to illustrate the relative movements in the regulatory DRP over time.

Figure 2. Allowed risk premiums on equity and debt under AER approach and parameter estimates



Source: Reserve Bank of Australia, Bloomberg, various regulatory determinations.
Estimates are computed as the risk premiums that the AER would have adopted if it had applied its approach to the relevant market data at the time.

52. Figure 2 shows that the debt risk premium for the benchmark firm has increased materially since 2008 and is well above the pre-GFC average. Prior to 2008, the DRP largely varied within the range of 1-2%, with some observations below 1%. In recent years, the DRP has generally varied within the range of 3-4%, with some observations above 4%. That is, the DRP is 3-4 times greater than what it was prior to 2008.

53. By contrast, the AER's estimates of the premium that investors in the benchmark firm would require for bearing equity risk has declined over the same period.

54. It is unlikely that there could be any circumstances whereby debt investors would be requiring materially higher risk premiums, but equity investors would be requiring lower risk premiums. These are the same investors in the same market for funds. It is illogical to expect that they would require risk premiums several times higher when buying debt securities, but then require lower risk premiums when buying equity securities. McKenzie and Partington (2011) provide similar advice to the AER:

> Similar to the equity premium, bond spreads also have fundamental determinants and the directional relationships are likely to be such that spreads and risk premiums are positively correlated. Given these commonalities, it is possible that the equity market risk premium might be related to the corporate bond spread, Damodoran (2011) finds that while a relationship clearly exists, the noise in the ratios is too high for any useful rule to be developed. He does argue that there is enough of a relationship however, that this approach may be useful to test to see whether the equity risk premiums make sense, given how risky assets are being priced in other markets.[23]

[23] McKenzie and Partington (2011), Paragraph 106.

55. That is, even if it is not possible to construct a precise mathematical link between debt and equity risk premiums, information about debt risk premiums (which are more directly observable) can be used to "see whether the equity risk premiums make sense."

56. Finally, we note that debt risk premiums are effectively observable whereas equity risk premiums are compiled from assumptions and estimates of economic models. Consequently, it is the debt risk premium that provides the more direct and objective evidence about the prevailing conditions in the market for funds.

57. Figure 2 above shows that the prevailing conditions in the market for funds require higher risk premiums. In this case, a reduction in the assumed equity risk premium is not commensurate with the prevailing conditions in the market for funds.

58. To put this into perspective, and consistent with Figure 2 above, prior to the GFC the regulatory premium for taking on equity risk was approximately 500 basis points higher than the regulatory premium for debt risk.[24] The recent Draft Decisions imply that the premium for taking on equity risk is now approximately 100 basis points.[25] In our view, the suggestion that the premium for equity risk has fallen to this extent is implausible.

The return on debt and equity is immaterially different for some investors

Return net of imputation credits

59. Under the AER's regulatory model, the CAPM estimate of the required return on equity includes the assumed value of dividend imputation franking credits. The proportion of the total return that is assumed to come in the form of imputation credits is:

$$\frac{\gamma T}{1-T(1-\gamma)},$$

where T is the relevant corporate tax rate and γ represents the extent to which dividend imputation is assumed to affect the cost of equity capital.

60. It then follows that the proportion of the return from sources other than imputation credits (i.e., from dividends and capital gains) is:[26]

$$\frac{1-T}{1-T(1-\gamma)}.$$

61. Using the values from the AER's recent Draft Decisions, the return to equity holders from dividends and capital gains is:

[24] With an equity beta of 1.0 and MRP of 6%, the premium for equity risk is 6%. Prior to the GFC the DRP was in the order of 1%.
[25] With an equity beta of 0.8 and MRP of 6%, the premium for equity risk is 4.8%, to be compared with a current DRP of 3.67%.
[26] Appendix 1 shows that this exact adjustment to the required return on equity is embedded within the National Electricity Rules and the AER's post-tax revenue model.

$$r_e\left[\frac{1-T}{1-T(1-\gamma)}\right]=7.78\%\left[\frac{1-0.3}{1-0.3(1-0.25)}\right]=7.0\%.$$

Return available to non-resident investors

62. It is generally agreed that non-resident investors receive no benefit from Australian imputation tax credits. Consequently, that class of investors receives an expected return on equity of only 7.0% from the benchmark firm. By contrast, and according to the AER's recent Draft Decisions, those same investors can receive a fixed rate of return of 6.74% from investment grade debt in the same benchmark firm.

63. Debt holders in the benchmark firm receive a fixed rate of return. They will receive a fixed return of exactly 6.74% p.a., so long as the firm is able to remain solvent. We deal with the likelihood of the benchmark firm becoming insolvent in some detail in a subsequent section of this report. At this stage, we note that:

    a) The AER assumes that the benchmark firm has a strong investment grade credit rating;

    b) The AER further concludes that financial market conditions have returned to pre-GFC levels;[27] and

    c) Although debt holders have provided only 60% of the benchmark firm's finance, they are entitled to first-ranking claim over 100% of the firm's cash flows.

    For these reasons, we consider it reasonable to assume that debt investors would invest in the benchmark firm reasonably expecting to receive the fixed return of 6.74%. This applies to resident and non-resident investors alike.

64. Those same non-resident investors also have the opportunity of investing in equity in the benchmark firm. An equity investment is clearly much riskier than a fixed rate investment grade loan. Lenders have the first claim over all of the firm's cash flows and assets. Equity investors have the last-ranking residual claim – whatever is left after debt holders are paid in full. A materially greater risk requires a materially greater expected return.

65. However, according to the AER's figures, non-resident investors would be allowed a (risky) expected return of 7.0% on their equity investment. That is, the AER's figures imply that a material number of investors will invest in residual equity in the benchmark firm for a premium of only 26 basis points over the return that they could receive on first-ranking investment grade debt in the same firm. In our view, a premium of 26 basis points for taking on such equity risk (relative to strong investment grade debt) cannot be considered to be commensurate with the prevailing conditions in the market for funds. It is highly unlikely that any investor would consider such a small premium to be attractive, whereas that is what the Draft Decisions imply.

AER estimates are inconsistent with assumed capital structure

66. The AER arrived at its equity beta estimate of 0.8 during the course of its last Review of WACC Parameters. The Statement of Regulatory Intent from this review was published in May 2009 and the AER has adopted an equity beta estimate of 0.8 in all gas and electricity network determinations since

[27] Envestra Draft Decision, Appendix B, pp. 54-55.

that time. The AER's 0.8 estimate was computed using a two-step approach, as set out in Henry (2008, Section 6, pp. 17-19):

a) The AER first estimated an asset beta, which is an estimate of the systematic risk facing equity holders if the entire firm was financed by equity; and

b) The AER then re-levered its asset beta estimate to reflect the assumed 60% debt financing[28].

67. The asset beta estimate in the AER's WACC Review was 0.32, which represents the AER's estimate of the systematic risk facing equity holders in the benchmark firm if it was financed entirely by equity. The AER's estimate then implies that, if the benchmark firm was financed entirely by equity, shareholders would require a total return of:

$$r_e = r_f + \beta_e \times MRP$$
$$= 2.98\% + 0.32 \times 6\% = 4.90\%.$$

68. That is, according to the AER's estimates, the benchmark firm's cost of capital could be materially reduced if it employed 100% equity financing.

69. It is not clear how the AER's estimate of the required return on equity can be considered to be commensurate with the prevailing conditions in the market for funds when the process that the AER has used to produce that estimate implies that the benchmark firm could materially reduce its cost of capital by removing all debt financing.

Allowed return on equity is materially below reasonable estimates of expected returns from comparable firms

Overview

70. It is well-known that, in a dividend imputation system, there are three components to the return to equity holders:

a) Dividends;

b) Capital gains, and

c) Imputation tax credits.

71. In this section of the report, we calculate a lower bound on each of the three components of return that investors might reasonably expect to receive from the average comparable firm. Taken together, this provides a lower bound on the aggregated return that investors might reasonably expect to receive from an investment in a comparable firm. This lower bound can then be compared with the allowed regulatory return as one test of whether the allowed return can reasonably be considered to be commensurate with the prevailing conditions in the market for funds.

[28] The levering/de-levering adjustment is shown in the WACC review final decision. AER (2009), Final Decision, Electricity transmission and distribution network service providers, Review of the weighted average cost of capital (WACC) parameters, May 2009; page 265.

Lower bound on the return from dividends

72. The AER has relied primarily on a set of six comparable firms when estimating beta and other firm-specific parameters in its last WACC Review. The currently available dividend yields on those firms are set out in Table 1 below.

Table 1. Current dividend yields for comparable firms

Company	Dividend yield (% p.a.)
APA	7.2
DUE	7.8
ENV	6.5
HDF	3.8
SKI	6.2
SPN	7.6

Source: Morningstar, 18/10/2012.

73. We note that these are currently available dividend yields. For example, if an investor were to buy shares in APA today, and if APA was to simply maintain its current dividend with no increase in dividends at any time in the future, that investor would receive a return of 7.2% p.a. on their investment every year in perpetuity. We note that this calculation is based on current observable dividend yields that are currently available to investors in the set of firms the AER has identified as being comparable to the benchmark firm. These numbers are not forecasts, they are currently available returns by buying shares at current market prices. Moreover, an investor who buys the shares today, will receive that dividend yield so long as the firm is able to maintain its dividends – regardless of whether the dividend yield in the future might increase or decrease. No forecast of what may or may not occur in the future is required to support this conclusion.

74. To the extent that these firms are likely to increase their dividends over time,[29] the return from dividends that is currently available should be considered to be a lower bound. If the level of dividends is increased in the future, those higher dividends would represent a higher return on the initial investment than the figures set out above. We note that the historical experience has been for firms, on average, to increase dividends over time and that brokers are currently forecasting material increases in the earnings and dividends of all of the comparable firms over future years, as set out in Table 2 below.

[29] Note that the relevant time horizon here is the indefinite future – there is an expectation that the dividend being paid by the average comparable firm will increase over the long-term indefinite future.

Table 2. Consensus forecasts of earnings and dividend growth

Company	Earnings growth (% p.a.)	Dividend growth (% p.a.)
APA	8.00	1.00
DUE	23.50	3.10
ENV	12.20	4.20
HDF	73.50	7.20
SKI	22.50	6.20
SPN	-0.80	2.90

Source: Morningstar, 18/10/2012.

75. We make no use of the forecasted increases in earnings and dividends, other than to note that they imply that the currently available return from dividends should be interpreted as a lower bound of the return that investors might presently expect from dividends from the comparable firms.

76. The average dividend yield[30] for the comparable firms set out in Table 1 above is 6.9%. Consequently, if an investor invested proportionally across all six comparable firms, and if all of those firms simply maintained their current dividend forever with no growth whatsoever, that investor would obtain an annual return of 6.9% on their investment in perpetuity.

77. We note that the current dividend yield for HDF is approximately half that of the other comparable firms. This is due to the fact that:

    a) HDF is currently the subject of a takeover offer. Two parties have been bidding for control of HDF and have made a series of escalating offers. The current HDF stock price reflects the control premium embedded in the takeover offer that is currently being considered by HDF security holders. Prior to the competing takeover bids, the HDF dividend yield was 6.6% – in line with the other comparable firms[31]; and

    b) The current HDF stock price reflects current expectations of very high growth in earnings and dividends – materially higher than for the other comparable firms, as set out in Table 2 above.

78. Because the figures for HDF are materially different from those for the other five firms, we also report the average dividend yield after omitting HDF from the sample – 7.2% p.a.

79. In the remainder of this section we conservatively adopt an average dividend yield of 7% for the sample of comparable firms. That is, we consider that investors in comparable firms might reasonably expect to be able to receive a return of at least 7% from dividends alone.

[30] Weighted by market capitalisation.

[31] Datastream reports that on 1 November 2011 the dividend yield on HDF was 6.6%. The share price has since been bid up from $1.60 on 1 November 2011 to $2.70 as at the end of October 2012 – an increase of nearly 70%. This results in a corresponding decrease in the dividend yield, which is based on historical dividends that have already been paid.

Lower bound on the return from capital gains

80. In its recent Draft Decisions, the AER adopts an estimate of expected inflation of 2.5%.[32] This implies that if the share price of the average comparable firm just maintains its real value, with no real appreciation at all, investors will receive a nominal return of 2.5% in the form of capital gains.

81. As for dividends, the historical experience has been, and the future expectation is, that share prices provide real returns to investors. For this reason the assumption that share prices will just maintain their value (over the long-term future) and will provide no real return at all to investors should be considered to be a lower bound.

Lower bound on the return including imputation credits

82. As noted above, Officer (1994), the paper on which the whole CAPM-WACC regulatory framework is based, presents specific formulas to compute, for a given estimate of gamma, the return from imputation credits. In particular, he shows that the return from dividends and capital gains only must be "grossed up" to reflect the value of imputation credits by multiplying by a factor of:

$$\frac{1-T(1-\gamma)}{1-T}$$

where T is the corporate tax rate and γ represents the extent to which imputation is assumed to affect the corporate cost of capital.[33]

83. In the present case we have:

$$(7\%+2.5\%)\frac{1-0.3(1-0.25)}{1-0.3}=10.5\%.$$

84. That is, a lower bound on the return including imputation credits is 10.5%.

Conclusions

85. We have used the AER's estimates from its recent Draft Decisions to compute a lower bound on the return that investors might reasonably expect from an investment in comparable firms. The result is a lower bound in the sense that:

    a) The return from dividends is based on the currently available dividend yield from the average firm (7%). The lower bound estimate assumes that the firm simply maintains the current dividend and there is no growth in dividends whatsoever;

    b) The return from capital gains is based on the AER's estimate of expected inflation (2.5%). The lower bound estimate assumes that the firm's share price will just maintain its value and will provide no real return at all to investors; and

    c) The adjustment for imputation credits is based on the AER's estimate of gamma (0.25) and the corporate tax rate (30%).

[32] Envestra Draft Decision, p. 43.
[33] The formulation above is shown as Equation 7 in Officer (1994).

86. This all implies that, on the AER's own estimates, investors in the shares of comparable firms would reasonably expect to receive a return of at least 10.5%. This can be compared with the AER's allowed return on equity of 7.78%.

87. It is not clear how the AER's allowed return on equity of 7.78% can be reasonably considered to be commensurate with the prevailing conditions in the market for funds when investors in comparable firms can reasonably expect to receive a return that is at least 35% higher[34] than what is being allowed to investors in the benchmark firm.

[34] 10.5% is approximately 35% higher than 7.78%.

3. Arithmetic vs. geometric average returns

Current AER approach

88. In its recent Draft Decisions, the AER concluded that:

> The AER considers the arithmetic average of 10 year historical excess returns would likely be an unbiased estimator of a forward looking 10 year return. However, historical excess returns are estimated as the arithmetic or geometric average of one year returns. If the one year historical excess returns are variable, then their arithmetic average will overstate the arithmetic average of 10 year historical excess returns. Similarly, the geometric average of one year historical excess returns will understate the arithmetic average of 10 year historical excess returns.
>
> The AER considers both the arithmetic and geometric averages are important to consider when estimating a 10 year forward looking MRP using historical annual excess returns. The Tribunal has found no error with this approach. The best estimate of historical excess returns over a 10 year period is thus likely to be somewhere between the geometric average and the arithmetic average of annual excess returns.[35]

89. The AER also notes that it:

> …had regard to both arithmetic and geometric averages in considering the appropriate value for the MRP in this decision.[36]

90. Although:

    a) the geometric averages are generally materially lower than the corresponding arithmetic averages; and

    b) the AER states that it has had regard to the geometric averages in determining a value for the MRP,

    the AER concludes that:

> even if the AER were to only rely on the arithmetic average, this would not change its position on the appropriate MRP value.[37]

91. This seems to imply that the AER has had regard to the geometric averages, but has afforded them no weight when arriving at the value of MRP. For the reasons set out below, we agree that geometric averages should be afforded no weight – the estimate of MRP should not depend in any way on any geometric average of historical excess returns. If this is the case, as it appears to be, there seems to be no point in continuing to publish any geometric averages.

[35] Envestra Draft Decision, p. 132.
[36] Envestra Draft Decision, Appendix B, p. 28.
[37] Envestra Draft Decision, Appendix B, p. 30.

Advice from the AER's consultants

Harvard Business School Case

92. In its recent Draft Decisions, the AER refers to its consideration of arithmetic and geometric averages in its Roma to Brisbane Pipeline (**RBP**) Decision. The AER refers to an SFG report submitted as part of the RBP determination process. In that report, SFG noted that the Marriott Corporation Case published by Harvard Business School specifically considers the question of whether the arithmetic or geometric average of historical excess returns should be used when estimating MRP for use in the CAPM. SFG noted that the Harvard Case Solution concludes that the arithmetic mean must be used. The Harvard solution also sets out the reasons why the arithmetic mean must be used and provides worked examples to illustrate why the arithmetic mean must be used.

93. The AER notes that it sought advice on this issue from its consultants. Lally (2012) concludes that:

> if historical average returns are used, they should be arithmetic rather than geometric averages.[38]

94. Lally (2012) further explains that:

> The AER's belief that geometric averages are useful apparently arises from a belief that there is a compounding effect in their regulatory process…However, I do not think that there is any such compounding effect in regulatory situations and the absence of a compounding effect leads to a preference for the arithmetic mean over the geometric mean.[39]

95. The AER notes that it sought further advice on this issue from McKenzie and Partington (2011) who advise that the Harvard Case is in error in concluding that the arithmetic average must be used to estimate MRP. McKenzie and Partington advise the AER that:

> the Harvard case study assumes away the source of bias in arithmetic averages. In the teaching note for the case study the probability distribution of returns is known, so there is no uncertainty about the mean of the distribution. Since the mean (arithmetic average) of the returns is known exactly, the problems of measuring the MRP largely go away.[40]

96. The AER has relied on this advice in its recent Draft Decisions:

> McKenzie and Partington explained the Harvard case study 'assumes away the source of bias in arithmetic averages'. The AER does not consider it is appropriate to assume no uncertainty about the mean of the distribution when analysing historical excess returns.[41]

97. In contrast to this advice, the calculation of an arithmetic average does *not* in fact require any assumption about the mean being known exactly. Nor does the calculation of a geometric average.

[38] Lally (2012), p. 5, repeated at pp. 32 and 34.
[39] Lally (2012), p. 31.
[40] McKenzie and Partington (2011), p. 5.
[41] Envestra Draft Decision, Appendix B, p. 29.

The Harvard Case Study does not require or assume or even suggest that any prior assumption about the mean of the distribution is required. Rather, the Harvard Case Study makes the point that *whatever* the distribution of historical stock returns, the arithmetic mean provides an estimate of the expected return that is suitable for use in the CAPM and the geometric mean does not. Two examples of different distributions are provided to make the point that, in both cases, the arithmetic mean is an appropriate estimate and the geometric mean is not. One could create any number of examples using any number of different distributions of historical returns and in every case the conclusion would be that the arithmetic mean is an appropriate estimate of the expected return and the geometric mean is not. This result does not require any assumption about any prior knowledge of the mean of the distribution.

98. Moreover, we note that the Harvard Case Study has been used by leading business schools for over 20 years and no error has ever been raised in relation to its conclusion that the arithmetic mean is an appropriate estimate of the expected return and the geometric mean is not.

99. In our view, McKenzie and Partington (2012) and the AER have erred in concluding that the Harvard Case Study is in error. The AER's conclusion in this regard is wrong, it is based on flawed advice from one of its consultants, it is inconsistent with the clear advice from another one of its consultants, and it is inconsistent with the accepted use of this case over the last 20 years.

Compounding effects and negative auto-correlation

100. McKenzie and Partington (2011) also refer to "compounding" effects[42] and the possibility that "returns are negatively auto-correlated."[43] Both of these suggestions are rejected by the AER's own consultants:

    a) Lally (2012) concludes that "I do not think that there is any such compounding effect in regulatory situations and the absence of a compounding effect leads to a preference for the arithmetic mean over the geometric mean.";[44] and

    b) Handley in a series of reports for the AER computes all standard errors on the basis that returns are *not* negatively auto-correlated.[45]

101. The AER does not explain why it has rejected the advice from its other consultants in favour of the advice from McKenzie and Partington (2011). In any event, McKenzie and Partington conclude that the geometric average should only receive a maximum of 10% weight in estimating MRP from historical excess returns data.[46]

102. The McKenzie and Partington advice is inconsistent with every other piece of evidence before the AER. In our view, no weight should be applied to the geometric mean of historical excess returns. We note that even if all other evidence is rejected and sole weight is applied to the advice of McKenzie and Partington, the geometric mean would only receive a maximum of 10% weight.

[42] McKenzie and Partington (2011), p. 6.
[43] McKenzie and Partington (2011), p. 6.
[44] Lally (2012), p. 31.
[45] See, for example, Handley (2012).
[46] McKenzie and Partington (2011), p. 8.

General conclusions from the AER's consultants

103. McKenzie and Partington (2011) advise that:

> the arithmetic average is arguably appropriate when attempting to find the best representation of expectations that are formed based on historical data,[47]

and that:

> a geometric average is clearly inappropriate for the purposes of characterising expectations.[48]

104. They also advise that:

> The arithmetic mean is also consistent with the assumptions of asset pricing models such as the CAPM.[49]

and that:

> Arithmetic averages are certainly more popular.[50]

Recent comments by the Tribunal

Context

105. In the recent Envestra MRP Case, the Tribunal noted that it did not need to decide the arithmetic vs. geometric mean issue, but indicated that it would make "some comments."[51] The Tribunal then made no formal conclusion on the issue, stating that:

> The material before the Tribunal in this matter does not allow it to decide this issue. Rather, it is a matter that the AER should consider in consultation with service providers and other interested parties.[52]

Geometric mean is less than arithmetic mean

106. In its consideration of arithmetic and geometric means, the Tribunal begins by noting that:

> It is the AER's view, with which the Tribunal agrees, that the cumulative return across a period greater than one year will be less that the average of yearly returns.[53]

[47] McKenzie and Partington (2011), Paragraph 31.
[48] McKenzie and Partington (2011), Paragraph 34.
[49] McKenzie and Partington (2011), Paragraph 31.
[50] McKenzie and Partington (2011), Paragraph 31.
[51] Application by Envestra Ltd (No 2), ACompT 3, Paragraph 147.
[52] Application by Envestra Ltd (No 2), ACompT 3, Paragraph 155.

107. To investigate this statement, consider a portfolio worth 100 that increases to 200 over the first year and then decreases to 180 over the second year. This portfolio has returns of 100% and -10% in each of the two years. The average of the yearly returns is 45%[54] and the cumulative return across the period is 80%, which is obviously *higher* than the average of the yearly returns.

108. What the Tribunal apparently meant to say was that the geometric mean return across a period of greater than one year will be less than the arithmetic mean of the yearly returns across the same period. This is well known to be true in all cases but for the special case where all of the yearly returns are equal. Moreover, it is also well known that the difference between the arithmetic and geometric means increases with the volatility of the annual returns.

Use of 10-year time horizon

109. In the recent Envestra MRP case, the Tribunal stated that the AER itself has:

> noted that the arithmetic mean of 10-year historical excess returns would likely be an unbiased estimator of a forward-looking 10-year return, the appropriate benchmark.[55]

110. That is, the AER is of the view that if it had available sufficient non-overlapping 10-year historical periods it would take the arithmetic average of those 10-year periods as an estimate of the expected return over the next 10-year period. Thus, it appears to be common ground that a geometric mean should not be computed in that case.

111. Of course, having obtained the arithmetic average of many non-overlapping 10-year periods (if there were a sufficient number of such periods), the AER would have to convert this back to an equivalent one-year return because an annualised WACC is ultimately required. For example, suppose the arithmetic average of a large number of 10-year periods turned out to be 79%. The AER would need to estimate the annual value that would compound up to 79% over 10 years as:

$$\begin{aligned} MRP_{annual} &= \left(1 + MRP_{10-years}\right)^{1/10} - 1 \\ &= \left(1.79\right)^{1/10} - 1 = 6\%. \end{aligned}$$

112. In our view, the matters set out in this sub-section are not the subject of any debate.

Tribunal example

113. The Tribunal goes on to note that for any particular historical period, the geometric mean will be less than the arithmetic mean, except for the case where the return is constant over the period, in which case the two means will be equal.

114. The Tribunal then presents a simple example of a case where the geometric mean is less than the arithmetic mean:

[53] Application by Envestra Ltd (No 2), ACompT 3, Paragraph 150.
[54] (100% + -10%)/2.
[55] Application by Envestra Ltd (No 2), ACompT 3, Paragraph 150.

> imagine a portfolio that is worth 100 at the beginning of year one. Suppose that in year one the portfolio falls to 80, a -20% return, before returning to 100 in year two. The cumulative two year return is zero, whereas the average annual return is (-0.2+0.25)/2=2.5%.[56]

115. An individual who invested $100 in this portfolio at the beginning of the two-year period has clearly earned a zero return over the two years. There is obviously no dispute about this. The backward-looking historical compound annual growth rate (**CAGR**) is computed as the geometric mean of a particular series of historical annual returns. But that is not the relevant question in terms of estimating the MRP to apply to a forward-looking period.

116. To see this, consider the following example which is based on the Tribunal's illustration above. Suppose that there is a portfolio whose return (with equal probability) is either -20% or +25% every year – these are the only two possible returns. Also suppose that we want to estimate the expected return over the next two years. The AER has stated, and we agree, that an appropriate way to estimate the forward-looking two-year return would be to take the arithmetic average of a sample of historical two-year returns.

117. For this portfolio, there are four possible combinations of two-year returns as set out in Table 3 below.

Table 3. Possible sequences of two-year returns in Tribunal example

Year	1	2
	25%	25%
	25%	-20%
	-20%	25%
	-20%	-20%

118. If the returns are serially independent, then these four possible outcomes are equally likely to occur. In the Tribunal's example, the observed historical returns were -20% followed by 25%. But this is only one possible realisation of what might have occurred. We might just have easily observed a 25% return followed by a 25% return or a -20% return followed by a -20% return, and so on.

119. In the context of this example, there are two ways to interpret what the historical data says about potential future returns:

    a) If the return is -20% in one year it will *always* be 25% in the next year, and if the return is 25% in one year, it will *always* be -20% the next year. That is, returns *always* occur in exactly the same sequence as was observed historically; or

    b) Every year, there is an equal chance of the returns being -20% or 25%. That is, each year in the future, returns occur with the same probability as has been observed in the past.

120. The first interpretation is consistent with the geometric mean and the second interpretation is consistent with the arithmetic mean being used to estimate MRP from historical data. Since no one has ever suggested that the first interpretation is reasonable, the geometric mean should not be used.

[56] Application by Envestra Ltd (No 2), ACompT 3, Paragraph 150.

Rather, the use of historical data is based on the second interpretation, which is consistent with the use of arithmetic means.

4. Historical mean excess returns produce an estimate of MRP that is commensurate with historical conditions in the market for funds

121. There is broad agreement that when using historical excess returns data to estimate MRP a long data series is required to obtain statistically reliable results. For example, McKenzie and Partington (2011) advise that:

> as the time frame used becomes shorter and the sample gets smaller there is a greater risk that outliers and skewed distributions will lead to a bias in the mean.[57]

122. This consideration, together with considerations of data quality, has led to analysis focusing on the period from 1958 – slightly more than 50 years of annual data. As set out above, it is appropriate to take the arithmetic mean of these historical excess returns to produce an estimate of the long-run average level of the MRP. That is, an analysis of long-run historical data produces (indeed, is only capable of producing) an estimate of the long-run average level of the MRP.

123. There is also broad agreement that the risk premiums that equity investors require vary over time. That is, the MRP is not constant, but varies over time. In some conditions in the market for funds, investors will require a higher premium for bearing equity risk, and in other conditions in the market for funds they will require a lower premium for bearing equity risk. Similarly, the debt risk premium changes over time as conditions in the market for funds change. For example, McKenzie and Partington (2011) advise that:

> the market risk premium has fundamental determinants (whatever they may be) and these may change over time, in which case the market risk premium changes.[58]

124. The use of CAPM parameter estimates that are conditional on the relevant information that is available at the time (i.e., conditional on the prevailing conditions in the market for funds) is consistent with the framework adopted by the AER. In a recent report for the AER, Davis (2011) concludes that:

> The AER approach could, I suggest, be viewed as an "implicit conditional CAPM" approach in which there is regular review of beta, the risk free rate and the MRP.[59]

and

> there is some support for a "conditional" CAPM in which forward looking expected returns depend on some stochastic factor(s) additional to the expected Market Risk Premium (which itself may be variable).[60]

125. The AER accepts this interpretation of the framework it uses to estimate the required return on equity:

[57] McKenzie and Partington (2011), Paragraph 22.
[58] McKenzie and Partington (2011), Paragraph 5.
[59] Davis (2011, p. 9).
[60] Davis (2011, p. 11).

> As noted by Professor Davis, the AER is using an 'implicit conditional CAPM' approach.[61]

126. Within this framework, there is a long-run unconditional mean estimate of MRP (which the AER has determined to be 6%) and a conditional mean estimate that varies above and below the long-run unconditional mean over time. The conditional estimate is based on (statistically speaking, it is "conditional" on) all relevant information that is available at the time.

127. The fact that the AER increased its estimate of MRP to 6.5% in its last WACC Review is further support for the notion that there is broad agreement that the risk premiums that equity investors require vary over time – that is, that the estimate of MRP that is commensurate with the prevailing conditions in the market for funds changes over time as the conditions in the market change.

128. The mean of historical excess returns is only capable of providing an estimate of the long-run average level of the MRP – commensurate with the average conditions in the market over the historical period. This does not necessarily provide a contemporaneous estimate of the MRP that is commensurate with the prevailing conditions in the market. The best illustration of this point comes from the AER's last WACC Review. It is common ground that during 2008 and early 2009 financial risk premiums increased materially. The AER specifically recognised this point in its WACC Review and accordingly increased its estimate of MRP.[62] At the same time that risk premiums were materially increasing, global stock markets plummeted. This, in turn, has the effect of reducing the historical mean of excess returns. That is, just when financial risk premiums are going up, the mean of historical excess returns is going down.

129. In general, the mean of historical excess returns moves in the opposite direction to the risk premiums that are commensurate with the prevailing conditions in the market for funds. When risk premiums rise, stock prices fall and the historical mean falls, and when risk premiums fall, stock prices rise and the historical mean rises. Consequently, the mean of historical excess returns does not provide an estimate of MRP that is commensurate with the prevailing conditions in the market for funds, but rather one that is commensurate with the average conditions in the market over the historical period.

130. Consequently, the question (so far as estimating MRP is concerned) is whether or not the prevailing conditions in the market for funds are commensurate with the average conditions over the historical averaging period. In the remainder of this report we consider a number of aspects of this question.

131. We also consider the central question of whether an approach that effectively fixes the MRP at a constant 6%, and pairs that estimate with a contemporaneous estimate of the risk-free rate, can possibly provide an estimate of the required return on equity that is commensurate with the prevailing conditions in the market for funds. Logically, it cannot – unless the MRP really is fixed at 6% by the financial markets. But this would imply that the market for funds always requires the same risk premium from equity securities whereas the risk premiums the same market requires from debt securities vary substantially over time. Moreover, it would also imply that if the market was to sell off equities to transfer funds to government bonds (i.e., a flight to quality), required returns on equity must fall – which is clearly illogical.

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[61] Envestra Queensland Gas Network, Final Decision, June 2011, Appendix B, p. 41.

[62] AER (2009), Final Decision, Electricity transmission and distribution network service providers, Review of the weighted average cost of capital (WACC) parameters, May 2009; pages 237-238. "The AER also notes that there may be an inverse relationship between the short term historical excess return and the short term forward looking MRP."

5. The use of survey responses and macroeconomic commentary

Overview

132. In its recent Draft Decisions, the AER has made use of two types of qualitative information in its consideration of MRP:

    a) Survey responses; and

    b) Macroeconomic commentary.

133. In this section, we set out our views about how this qualitative information should be interpreted and about how much weight should be afforded to it, paying particular regard to recent direction on this issue from the Tribunal.

Current AER use of survey responses

134. In its recent Draft Decisions, the AER concludes that:

> Survey evidence reflects the forward looking MRP when applied in practice. It is subject to limitations, such as the uncertainty on imputation credit adjustment. However, based on its own review and the advice from McKenzie and Partington, the AER considers survey based estimates of the MRP are relevant to inform the forward looking MRP. In this decision, it considered a range of survey evidence conducted in different time periods and targeted at different respondents. The evidence supported a forward looking MRP of 6 per cent as the best estimate in the current circumstances.[63]

135. The AER sought advice on this issue from McKenzie and Partington (2011, 2012) who conclude that survey evidence suffers from "potential problems."[64] The problems with survey data include:

    a) the wording of the survey questions is unclear – it is generally not known precisely what respondents were asked to provide;

    b) the surveys typically do not explain how those surveyed were chosen;

    c) a majority of those surveyed did not respond;

    d) it is unclear what incentives were provided to ensure respondents would provide accurate responses, or whether respondents face incentives to provide self-serving responses;

    e) whether respondents supplied MRP estimates that use continuously compounded or not continuously compounded returns is unclear;

    f) the risk-free rate that respondents use is unclear;

    g) whether the respondents supplied MRP estimates that include the assumed effect of dividend imputation tax credits is not made explicit;

[63] Envestra Draft Decision, Appendix B, p. 34.
[64] McKenzie and Partington (2012), p. 19.

h) the relevance of some of the surveys is unclear given changes in market conditions since the surveys were conducted.

136. McKenzie and Partington (2012) conclude that:

> Despite the potential problems, we give significant weight to the survey evidence.[65]

The appropriate use of survey data

137. McKenzie and Partington (2012) note that many stakeholders have questioned the reliability of survey responses as a technique for estimating MRP, and then pose the following question:

> We begin by noting that the issues of survey reliability do not seem to have been a big feature when regulated businesses have used survey evidence to argue that imputation credits are little used in valuations and hence have little or no value. Yet, the same surveys, such as Truong Partington and Peat (2008), KPMG (2005), also provide evidence on the MRP, as can be found in our main report. Are we to conclude that the regulated businesses believe that survey evidence on imputation credits is reliable, but that survey evidence on the MRP is not?[66]

138. What this question seems to have overlooked is that there are two distinctly different types of survey evidence. Surveys can be useful when asking questions about what people actually *do* (e.g., whether or not their company regularly adjusts the cost of capital in relation to dividend imputation tax credits). However, questions about what people think might happen in the future (e.g., how much the stock market might go up over some future period) are of no practical use. In this regard, McKenzie and Partington (2012) note that only:

> two of the surveys that we cite did not rely on asking respondents what they thought the MRP was, but rather observed what MRP was actually used by expert valuers.[67]

139. Moreover, MRP varies over time with changes in the prevailing conditions in the market for funds. What respondents might have done in relation to MRP some time ago, when market conditions were different, is of little relevance. By contrast, the extent to which distributed imputation credits are capitalised into stock prices (theta) is not expected to vary over time with market conditions. Rather theta may vary with changes in tax laws (which is ultimately an empirical question).

140. In summary, it is not the case that stakeholders consider that survey evidence on imputation credits is reliable but that survey evidence on MRP is not. Rather, survey evidence is reliable when:

a) respondents are asked what they actually do and not when they are asked to predict the future; and

b) it is timely in the sense that the quantity in question is unlikely to have changed since the survey was conducted.

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[65] McKenzie and Partington (2012), p. 19.
[66] McKenzie and Partington (2012), p. 16. For completeness, to our knowledge no one has ever argued that imputation credits "have little or no value." The argument is that they have little or no effect on the corporate cost of capital, which is a wholly different issue. But that is beside the point here.
[67] McKenzie and Partington (2012), p. 18.

Recent guidance from the Tribunal: Requirements that must be met for survey responses to be used

141. The Tribunal has recently had regard to the use of qualitative evidence such as survey responses. In relation to surveys, the Tribunal noted that the survey evidence on which the AER has sought to rely has been criticised for not providing a sufficient real world context to give the survey results any real meaning and concluded that:

> Surveys must be treated with great caution when being used in this context. Consideration must be given at least to the types of questions asked, the wording of those questions, the sample of respondents, the number of respondents, the number of non-respondents and the timing of the survey. Problems in any of these can lead to the survey results being largely valueless or potentially inaccurate.
>
> When presented with survey evidence that contains a high number of non-respondents as well as a small number of respondents in the desired categories of expertise, it is dangerous for the AER to place any determinative weight on the results.[68]

142. In essence, the Tribunal requires that three conditions must be met for survey responses to be given any material consideration:

a) The survey must be timely – there must have been no change in the prevailing conditions in the market for funds since the survey was administered;

b) There must be clarity about precisely what respondents were asked so that there is no ambiguity about how to interpret their responses; and

c) The survey must reflect the views of the market and not a sample that is small, unresponsive, or without sufficient expertise.

143. None of these requirements are met by the survey responses on which the AER has relied:

a) Timeliness – the key feature of the prevailing conditions in the market for funds is the historically low government bond yield. The yield on 10-year government bonds is currently around 3%. Any surveys that were administered in materially different market conditions cannot provide any estimate of the MRP that is commensurate with the prevailing conditions in the market for funds;

b) Clarity – survey responses in relation to MRP are notoriously vague and ambiguous. On this measure, survey responses could only be considered if:

   i) Respondents were asked about what they actually do, not if they were asked to predict the future;

   ii) Respondents were also asked what estimate they used for the risk-free rate (one possible practice being to maintain a constant long-run average estimate of MRP and to match it with a long-run average estimate of the risk-free rate, such as was adopted by the Tribunal in the Energy Australia Case);[69]

[68] Application by Envestra Ltd (No 2), ACompT 3, Paragraphs 162-163.
[69] ACompT 8 (2009).

iii) Respondents were also asked whether they made any other adjustments to reflect current market conditions (one possible practice being to select a WACC value from near the top of a reasonable range, such as was adopted by IPART in the NSW Retail Electricity Price Review, 2012);

iv) Respondents were also asked to set out the time horizon for which their response applies. To the extent that the AER is of the view that different MRP estimates apply to different time horizons, only survey responses that relate to the 10-year time horizon that is adopted by the AER would be relevant; and

v) Respondents were also asked to specify whether their estimate of MRP was to be used in the CAPM to produce an estimate of the total required return, which would then be multiplied by $\frac{1-T}{1-T(1-\gamma)} = \frac{1-0.3}{1-0.3(1-0.25)} = 0.90$ when estimating the firm's cost of capital, consistent with the regulatory approach. This last question would determine whether respondents were reporting an MRP estimate on the same basis as that used by the AER.

Only if all of these requirements are met will the survey response be consistent with the AER's definition and use of MRP.

c) Sample – the Tribunal requires that the weight applied to survey data must reflect the non-response rate and the expertise of the sample respondents.

Adjustment for imputation credits

144. Under the regulatory approach adopted by the AER, the estimate of MRP must reflect the assumed value of imputation credits. Surveys rarely include information about whether MRP estimates have been adjusted to reflect an assumed value of franking credits. Even rarer is information about precisely what adjustment (if any) has been made. On this issue, McKenzie and Partington (2012) conclude that:

> Given that we don't really know whether survey responses do, or do not, allow for imputation credits and given that any adjustment for imputation would likely lie within the margin of measurement error, it seems best to take the survey evidence at face value, but tempered by the uncertainty about whether an imputation adjustment is needed.[70]

145. The overwhelming weight of evidence is that market practitioners make no adjustment for imputation credits. The AER itself has recently stated that:

> The AER agrees that the clear evidence is that the majority of market practitioners do not make any adjustment for the value of imputation credits.[71]

146. In summary, the AER requires an estimate of MRP that includes *its* assumed value of imputation credits. There is "clear evidence" that market practitioners make no such adjustment. Consequently an adjustment is required. The required adjustment is not complicated and does not have to be

[70] McKenzie and Partington (2012), p. 18.
[71] WACC Review Final Decision, p. 407.

estimated – it is a mechanical function of the AER's parameter estimates. Indeed, in a report for the AER, Handley (2008) demonstrates that an estimate of the required return that does not reflect the assumed value of imputation credits (r_e^*) can be simply converted into one that does reflect the assumed value of imputation credits (r_e) by applying an adjustment factor as follows[72]:

$$r_e^* = r_e\left[\frac{1-T}{1-T(1-\gamma)}\right].$$

147. In summary, an adjustment should be made and the AER's consultant has set out precisely how to do it. It is not clear why McKenzie and Partington would recommend that the AER should "take the survey evidence at face value, but tempered by the uncertainty about whether an imputation adjustment is needed," or why the AER would accept that recommendation. This appears to mean that one should recognise that an adjustment for imputation credits is required, but to proceed as though it were not. There is "clear evidence" that survey respondents make no adjustment for imputation credits, in which case the adjustment set out by Handley (2008) must be applied to avoid an apples-with-oranges comparison.

148. Moreover, even if a small number of survey respondents did indicate that they had made an adjustment in relation to imputation credits, it is highly unlikely that any would have assumed precisely the same value for gamma as the AER has used. Consequently, an adjustment would still be required to avoid an apples-with-oranges comparison.

The use of general macroeconomic commentary

149. In relation to general macroeconomic commentary, the AER concludes in its recent Draft Decisions that:

> General market commentary and economic outlook provided by eminent bodies gives useful insights into the current and future state of the financial market. However, because most commentaries do not specifically refer to returns in equity markets, the link between the market commentary and the MRP is difficult to quantify. Consistent with comments by the Australian Competition Tribunal in a recent decision and the views of Multinet and SFG, the AER places limited weight on this evidence.[73]

150. The Tribunal has recently drawn a clear distinction between general economic forecasts and estimation of the market risk premium noting that no case has been made for quantitatively linking the two. The Tribunal has concluded that:

> It is not appropriate for the AER to infer from generally positive economic forecasts conclusions as to the likely MRP. These reports are not intended to provide forecasts of equity returns. Further, the reports do not endeavour to address the extent of correlation between economic performance and equity risk. This correlation would need to be explicitly dealt with, either by the forecasting bodies, the AER or expert evidence, before these reports could be usefully or validly employed to assist in forecasting the MRP.[74]

[72] This adjustment factor is essentially the same as that shown in equation (7), Officer (1994).
[73] Envestra Draft Decision, p. 53.
[74] Application by Envestra Ltd (No 2), ACompT 3, Paragraph 158.

151. The Tribunal is clear in stating that a relationship between forecasted economic performance and equity risk must be "explicitly dealt with" for the use of this general commentary to be useful or valid. The AER has not provided any evidence of any link between these economic musings and equity risk premiums, explicit or otherwise. Consequently, in placing some weight on this commentary (albeit limited weight) the AER is in conflict with the direction of the Tribunal. In our view, the AER should place no weight on this commentary.

152. We also note that McKenzie and Partington (2011) conclude that:

> The main problem with such commentary is twofold: first, the people making the claims rarely provide any sort of justification to their claims. This means that it is near impossible to determine the basis on which they are making their assertions. Second, it would be fairly easy to gather a large sample of expert comments, which would have a wide range of estimates. The choice of which estimate is correct is going to be extremely subjective.[75]

and that:

> We would not give much weight to macro-commentary.[76]

Conclusions in relation to qualitative information

153. In our view, the best information about the current conditions in the market for funds comes from current prices and practices in the market for funds, rather than from survey responses, macroeconomic commentary or outdated observations. We note that this view is consistent with the recent directions from the Tribunal.

[75] McKenzie and Partington (2011), Paragraph 75.
[76] McKenzie and Partington (2012), p. 28.

6. The expected return on debt

Overview

154. McKenzie and Partington (2012) argue that the MRP and DRP cannot be directly compared because:

> the MRP is an expected return and the yields on debt are a promised return. The promised return is only same as the expected return for debt where there is no default risk. For all other debt the promised return is higher than the expected return.[77]

155. We agree that the debt yield is a promised return and that the expected return is a function of:

a) the probability of default – the probability that the firm will have insufficient cash from trading and asset sales to make the full payments it has promised to debt holders; and

b) the recovery rate in the event of default – when defaults occur, debt holders almost always receive some portion of what they have been promised. Standard and Poor's report average recovery rates of 60-70% on investment grade corporate debt.

156. However, for the reasons set out below, we do not agree that the regulatory MRP and DRP can move independently.

Defaults also have implications for equity holders

157. The main thrust of the argument of McKenzie and Partington (2011, 2012) is that the firm might default on its debt obligations, in which case debt holders receive less than they were promised. But consider what happens to equity holders in that circumstance. A firm only defaults on its debt obligations if it has insufficient cash from trading and/or asset sales to meets its debt obligations. In this case, the debt holders are paid less than they were promised, and the equity holders receive nothing. That is, the "risk of default" can also be considered to be "the risk that the equity becomes worthless."

158. If there is an increase in the risk of default, there is the same increase in the risk of the equity becoming worthless. McKenzie and Partington (2011) present an illustration where the probability of default increases to 20%, but the required return on equity remains unchanged.[78] If actual equity investors were told that the risk of their investment becoming worthless had increased to 20%, they would require a higher return commensurate with the higher risk. It is simply implausible to suggest that the required return on equity would be independent of the probability of that equity becoming worthless.

159. The illustration in McKenzie and Partington (2011) *assumes* that equity holders would require no higher return even when the risk of their investment becoming worthless rises to 20%. The illustration shows that, under that assumption, the DRP increases but the MRP does not. Of course that is the case, because that is precisely what has been assumed. In reality, however, equity holders *would* require a higher return when the risk of their investment becoming worthless rises to 20%, and the increase in DRP would be accompanied by an increase in the required return on equity.

[77] McKenzie and Partington (2012), p. 22.
[78] McKenzie and Partington (2011), p. 31.

Logic

160. A number of stakeholders have submitted that there is an inconsistency in that:

    a) The debt risk premium allowed by the AER is now 3-4 times higher than it was prior to the GFC; but that

    b) The equity risk premium allowed by the AER is no higher than it was prior to the GFC.

161. That is, debt holders are now being allowed a much higher premium to cover the risk that they face, but equity holders are considered to require no higher return at all. Stakeholders have submitted that if the risk and return required by debt holders is so much higher, then surely the risk and return required by equity holders should also be higher.

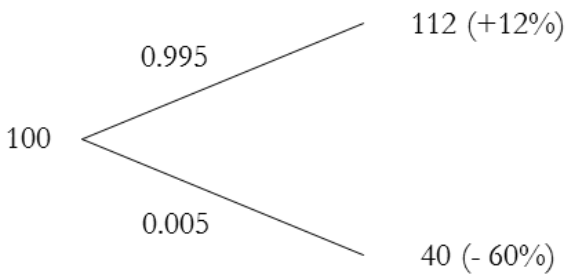
162. In its recent Draft Decisions, the AER argues that the allowed return on equity has been kept low because part of the increase in the DRP might be due to an increased risk of default. That is, equity returns have been kept low because there is an increased risk of default and insolvency such that the equity becomes worthless. In our view, it defies logic to argue that the allowed return on equity should be lower because there is an increased risk of insolvency.

DRP can be high even when the probability of default is small

163. A high value for the DRP need not imply a high probability of default. To illustrate this point, consider the following example. Suppose that the return on the market portfolio will be 12% with probability 0.995 and -60% with probability 0.005. That is, there is a 0.5% chance (1 in 200 years) of a financial crisis type event. Other than that, the market return is expected to be 12%. In this case, the expected return on the market portfolio is 11.64%.[79] Suppose also that the risk-free rate of interest is 5.5%, in which case the MRP is 6.14%.[80]

164. Now consider an asset that has a return identical to that of the market, and suppose that asset has a current price of $100. The potential payoffs and returns on that asset can be summarised as in Figure 3 below.

Figure 3. Asset payoffs and returns.

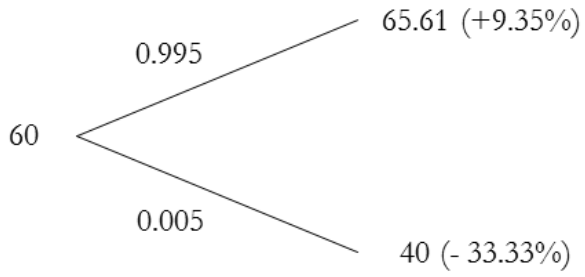


165. Because this stock mimics the market portfolio, it has a beta of 1 and an expected return of 11.64% – the same as the market.

[79] 11.64 = (0.995 × 12) + (0.005 × - 60).
[80] 6.14 = 11.64 – 5.5.

166. Now suppose that firm moves to a 60/40 capital structure by issuing $60 of debt (using the proceeds to retire equity). Also, suppose that the yield on this debt is 9.35% (we show below why the yield must be exactly equal to this figure). The potential payoffs and returns on this debt are summarised in Figure 4 below. In the "solvency" state, the debt holders are paid what they were promised, plus interest,[81] and the equity holders will receive the residual. In the "insolvency" state, the debt holders receive the entire $40 of assets that the firm has available and the equity holders receive nothing.

Figure 4. Debt payoffs and returns.



167. From Figure 4, the expected return on the debt is 9.14%.[82] Also note that the beta of the debt is 0.59,[83] in which case consistency with the CAPM requires that the expected return must be:

$$r_d = r_f + \beta_d \times MRP$$

$$9.14 = 5.5 + (0.59 \times 6.14)$$

168. That is, there is a unique solution for the promised yield that equates the expected return in Figure 4 with the expected return from the CAPM – the yield in this case must be 9.35%.

169. This in turn implies a DRP of 3.85%.[84] That is, a DRP consistent with current regulatory estimates arises in equilibrium even though there is only a 1 in 200 year chance of default. Moreover, the difference between the yield and the expected return is only 21 basis points (9.35% - 9.14%).[85]

170. In summary, a relatively high DRP does not necessarily imply a high probability of default, nor a material difference between the promised yield and the expected return.

Application to the benchmark firm

171. It is important to note that the regulator sets the DRP value for the benchmark regulated firm. This in turn determines the regulatory estimate of the promised yield on debt for the benchmark regulated

[81] 60 × 1.0935 = 65.61.
[82] 9.14 = (0.995 × 9.35) + (0.005 × - 33.33)
[83] $\beta = \frac{cov_{i,m}}{\sigma_m^2}$ = 0.59 = 0.001529 ÷ 0.002579; where $cov_{i,m} = \sum_{i=1}^{n} p_i\left[\left(R_i - E(R_i)\right)\left(R_m - E(R_m)\right)\right]$ = 0.001529 = 0.995 × [(9.35 – 9.14)(12 – 11.64)] + 0.005 × [(-33.33 – 9.14)(-60 – 11.64)]; and $\sigma_m^2 = \sum_{i=1}^{n} p_i \left(R_m - E(R_m)\right)^2$ = 0.002579 = 0.995 × (12 – 11.64)² + 0.005 × (-60 – 11.64)².
[84] 3.85 = 9.35 – 5.5.
[85] The same conclusions would follow if there is an increase in the probability of default and a corresponding decrease in the loss to debt holders in the event of a default.

firm. The argument set out above is that the expected return on debt for the benchmark regulated firm is lower than the promised yield on debt for the benchmark regulated firm. That is, the argument is that debt investors in the benchmark firm should expect a return that is materially lower than the allowed return on debt because there is a material chance that the revenue that the regulator has allowed will be insufficient to pay what has been promised to those debt holders.

172. However, a regulatory determination that results in there being a material chance that the revenue that the regulator has allowed will be insufficient to pay what has been promised to those debt holders, would appear to be inconsistent with the National Gas Law. For example, the National Gas Objective set out in s. 23 of the National Gas Law refers explicitly to the "long term interests of consumers" and the "security of supply of natural gas." Causing a service provider to face a material chance of insolvency is inconsistent with the long term interests of consumers and with the security of supply of natural gas.

173. Consequently, any argument that relies on material default risk for the benchmark firm would not seem to be one that is open to the regulator.

Implications for the allowed return on equity for the benchmark firm

174. McKenzie and Partington (2012) and the AER correctly note that, in the context of the regulatory framework, the return on equity is an *expected* return.[86] The AER estimates that expected return using the CAPM and then sets the regulatory revenue requirement such that the benchmark firm would be able to pay that return to equity holders. However, the equity holders receive that return only so long as the regulated firm remains solvent. In the event of insolvency and default, the equity becomes worthless and the return on equity is -100%. For example, suppose the CAPM estimate of the expected return on equity is 12% and there is a 5% chance of default. In this case, the regulated firm should be allowed to charge prices that would be sufficient to provide a return to shareholders of 18%. Thus shareholders would receive a return of 18% if the firm remains solvent (95% probability) and would lose their investment if it does not. Shareholders would thus face an expected return of 12%, consistent with the CAPM estimate.[87]

175. In summary, if the regulator considers that there is a material probability of default for the benchmark firm, that probability should be identified so that the allowed return on equity can be appropriately grossed-up as set out above.

[86] McKenzie and Partington (2012), pp. 21-22; Envestra Draft Decision, Appendix B, p. 47.
[87] That is, $0.95 \times 18\% + 0.05 \times (-100\%) = 12\%$.

7. Determining whether the allowed return on equity is commensurate with the prevailing conditions in the market for funds

Overview

176. The Rules require that the regulatory return on equity must be commensurate with the prevailing conditions in the market for funds.[88]

177. In determining its estimate of MRP, the AER has relied primarily on the average of historical excess returns. An estimate based on a long-term historical average will (obviously) reflect the average of the conditions in the market for funds that applied during the relevant historical period.

178. Consequently, when estimating the MRP the central question is whether or not the prevailing conditions in the market for funds (insofar as they relate to financial risk premiums) are commensurate with the average conditions over the historical averaging period. In this section, we consider the question of how one would reasonably determine whether or not the prevailing conditions in the market for funds (insofar as they pertain to the premiums that investors require for bearing risk) are commensurate with the average conditions over the historical averaging period.

Previous SFG reports

179. There is a vast empirical asset pricing literature that identifies a number of variables that appear to be related to required returns on equity and market risk premiums. The AER's recent Draft Decisions note our previous submissions that examine a number of these variables. In particular, we have sought to compare the prevailing values of those variables with their average values over historical periods as a means of determining whether or not the prevailing conditions in the market for funds (in relation to required returns on equity and the premiums that investors require for bearing risk) are commensurate with the average conditions over the historical averaging period.

180. The AER has rejected that analysis, primarily on the basis that it is not possible to precisely quantify the link between any of these financial indicator variables and the CAPM MRP. For example, the AER concludes that, although there may well be a relationship between expected financial market volatility and financial risk premiums, it is not currently possible to use that information to make "an accurate and reliable adjustment to the MRP."[89] Similarly, the AER concludes that, although a number of studies document a relationship between dividend yields and the MRP, that relationship is not sufficiently "statistically reliable" to be used as a means of estimating the MRP.[90]

181. We agree with the AER that, whereas a number of financial indicator variables have been identified in the literature, that literature has not reached the state where there is a consensus about the precise mathematical relationship between each variable and the MRP. Given the nature of the data in this area, and the fact that MRP cannot be directly observed, it is unlikely that the literature could ever meet the standard required by the AER.

[88] National Gas Rules, r. 87(1).
[89] Envestra Draft Decision, Appendix B, p.46.
[90] Envestra Draft Decision, Appendix B, p.46.

AER approach

Historical data can only be used to estimate the current MRP if the current market conditions are commensurate with those over the historical period

182. In its recent Draft Decisions, the AER appears to recognise that:

a) An estimate of MRP based on a long-term historical average will reflect the average of the conditions in the market for funds that applied during the relevant historical period; and

b) The central question, when estimating MRP, is whether or not the prevailing conditions in the market for funds are commensurate with the average conditions over the historical averaging period.

183. For example, the AER states that:

> Although not strictly forward looking, historical excess returns have predominantly been used to estimate the MRP on the assumption that investors base their forward looking expectations on experience.[91]

184. That is, the AER recognises that historical data reflects historical market conditions, but notes that it will also reflect prevailing market conditions if those prevailing conditions are the same as the historical conditions. This appears to be common ground (and indeed a matter of basic logic).

The AER concludes that the current market conditions (relating to risk premiums on equity) are commensurate with those before the GFC

185. The AER concludes that the prevailing conditions in the market for funds (relating to risk premiums on equity) are commensurate with those prevailing prior to the GFC, in which case the historical estimate of MRP can be interpreted as an estimate that is commensurate with the prevailing conditions in the market for funds. For example, the AER estimates the "long run historical MRP" to be 6%[92] and concludes that:

> It considers an MRP of 6.0 per cent is the best estimate in the circumstances and given prevailing conditions in the market for funds.[93]

186. That is, the AER's current estimate of the MRP is the same as its long-run historical estimate because it considers that the prevailing required premiums on equity investments are commensurate with those prevailing prior to the GFC.

187. It is important to note that the AER does not conclude that the prevailing conditions in the market for funds are *generally* commensurate with those prior to the GFC – only that the prevailing *required premiums on equity investments* are commensurate with those prevailing prior to the GFC. For example, the AER concludes that:

a) Risk premiums on debt investments are now several times higher than before the GFC; and

[91] Envestra Draft Decision, p. 130.
[92] WACC Review Final Decision, p. 220.
[93] Envestra Draft Decision, p. 129.

b) The total required return on equity is now materially lower than before the GFC (and is currently lower than at any time on record).

The AER's conclusion that current equity risk premiums are commensurate with those before the GFC is based on survey data

188. The basis for the AER's view that current equity risk premiums are commensurate with those prevailing prior to the GFC is some survey data. For example, Lally (2012) states that the:

> AER gives primary weight to historical averaging of excess returns and survey results in estimating the forward-looking MRP,[94]

and the only sources of data that the AER lists as being "reasons" for its adoption of a 6% estimate for MRP are "historical excess returns" and "surveys of market practitioners."[95]

189. That is, historical data is used to estimate the historical MRP and survey data is used to conclude that the historical estimate is appropriate as the current estimate.

190. The AER also sets out a number of things that were not identified as reasons for the adoption of the 6% estimate, but which were identified as things that were "also considered" in an appendix to the main Decision.[96] This list includes dividend growth models and a range of approaches for estimating the prevailing MRP that were submitted by regulated businesses. All of these approaches pointed towards prevailing MRP estimates materially above 6%, however the AER found fault with them all and placed no reliance on them in determining its current estimate of 6%. For example, in relation to dividend growth models, the AER noted that:

> The AER notes DGM analysis is producing high positive MRP estimates,[97]

but then identifies a number of issues that it considers would materially affect the reliability of estimates using this technique and concluded that:

> the AER considers the limitations discussed…limit the emphasis that should be attached to that analysis.[98]

191. For completeness, the AER has indicated that it also placed some weight on general market commentary in arriving at its 6% estimate of MRP, but notes that:

> the AER places limited weight on this evidence.[99]

[94] Lally (2012), p. 5.
[95] Envestra Draft Decision, p. 129.
[96] Envestra Draft Decision, p. 129.
[97] Envestra Draft Decision, p. 130.
[98] Envestra Draft Decision, p. 129.
[99] Envestra Draft Decision, p. 53.

What should be done to determine whether current equity risk premiums are commensurate with those before the GFC?

192. The central issue in relation to the estimation of MRP in this case is the question of whether or not the current conditions in the market for funds (insofar as they relate to MRP) are commensurate with the conditions prior to the GFC. Only if they are can the long run average estimate of MRP can be used as the current estimate.

193. We have noted above that the AER's conclusion that current equity risk premiums are commensurate with those before the GFC is based on survey data, with limited weight placed on general market commentary. In Section 5 above, we set out reasons why this qualitative evidence should be afforded no weight. It is our view that the survey data and general market commentary on which the AER has relied should not, and cannot, be used to support the conclusion that current equity risk premiums are commensurate with those before the GFC.

194. Moreover, our view is that not only is it wrong for the AER to have relied on that survey and commentary information, but it was also wrong to have relied *only* on that information in reaching the conclusion that current equity risk premiums are commensurate with the conditions prior to the GFC. It is our view that at least some of the other information, techniques, and evidence submitted as part of this review is relevant in determining whether the current conditions in the market for funds are commensurate with the conditions prior to the GFC. We note that Lally (2012) expresses the same view:

> I consider that the AER should give consideration or additional weight to a number of other methods.[100]

195. We understand that the AER has concluded that the dividend growth model and other techniques submitted by stakeholders are unable to produce accurate or definitive point estimates of the MRP. But it does not follow that, just because a piece of information is not used to obtain a point estimate of MRP, it should be disregarded entirely. For example, even if one concludes that the DGM should not be used to obtain a point estimate for MRP, knowing that the current estimates are materially above the long-run average is useful in determining whether the prevailing conditions in the market are commensurate with the long-run average.

196. In our view, there is substantial evidence to support the conclusion that current equity risk premiums are not now commensurate with the conditions prior to the GFC. The most compelling such evidence is the fact that the market for funds now requires materially higher risk premiums when investing in debt securities. It is implausible to suggest that the same market for funds would not require higher risk premiums when investing in equity securities.

197. Figure 5 below shows that the regulatory estimate of the risk premium on debt in the benchmark firm is now 3-4 times higher than the pre-GFC regulatory estimate. In our view, it is implausible to suggest that a market that requires a three- to four-fold increase in risk premiums when investing in debt securities in the benchmark firm, would require no additional risk premium at all when investing in equity securities in the same firm.

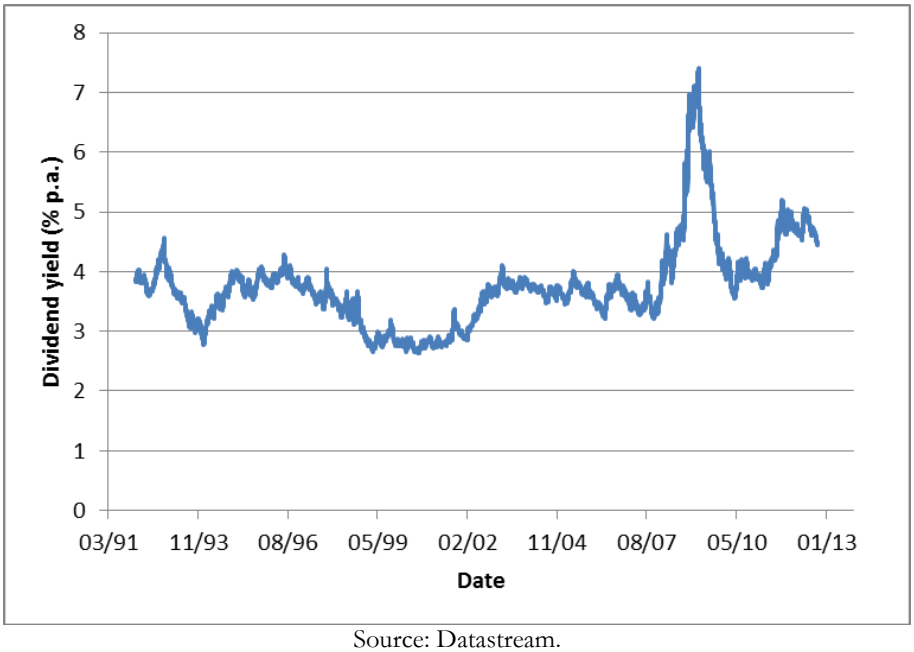
[100] Lally (2012), p. 5.

Figure 5. Regulatory risk premiums on debt

Source: Reserve Bank of Australia, Bloomberg, various regulatory determinations.

Figure 6 below shows the dividend yield on the ASX 200 index over the last 20 years. A higher dividend yield is indicative of a higher required return on equity – a high dividend yield occurs when stock prices are low relative to dividends, indicating that the market is applying a high discount rate to dividends. Figure 6 shows that the current dividend yield is greater than almost 90% of the observations over the last 20 years and above almost every observation from outside the GFC/European debt crisis period. This indicates a high required return on equity relative to the last 20 years.

Figure 6. ASX dividend yield

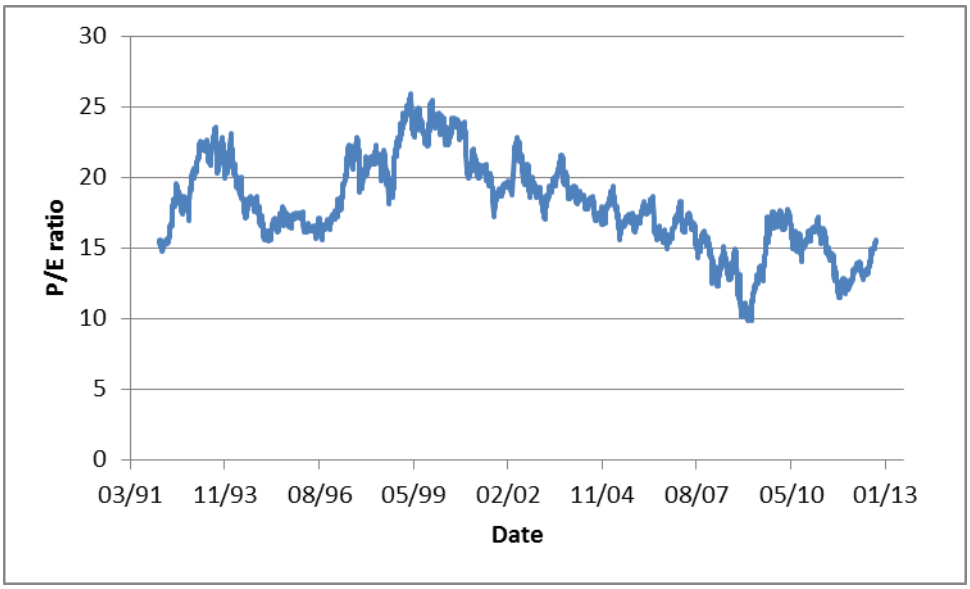


Source: Datastream.

198. In summary, Figure 6 indicates that required returns are currently high relative to the last 20 years. In its recent Draft Decisions, the AER has allowed a return on equity that is lower than at any time on record.

199. Figure 7 below shows the price earnings (**P/E**) ratio for the ASX 200 index over the last 20 years. A lower P/E ratio is indicative of a higher required return on equity – a low P/E ratio occurs when stock prices are low relative to earnings, indicating that the market is applying a high discount rate to earnings. Figure 7 shows that the current P/E ratio is lower than more than 80% of the observations over the last 20 years and below almost every observation from outside the GFC/European debt crisis period. This indicates a high required return on equity relative to the last 20 years.

Figure 7. ASX price/earnings ratio



Source: Datastream.

200. In summary, Figure 7 indicates that required returns are currently high relative to the last 20 years. In its recent Draft Decisions, the AER has allowed a return on equity that is lower than at any time on record.

201. Option implied volatilities have also been used as an indicator of perceived risk. We note that the AER has concluded that this measure should receive limited weight due to a number of issues with implied volatility data, including the three-month time horizon of the options that are generally used, the variability of the data over short periods, a number of measurement issues, and the lack of an explicit and accepted link between short-term volatility and required returns.[101] The AER also notes that option implied volatilities are currently at long-term average levels.[102] That is, to the extent that option implied volatilities do provide some indication of required returns, the current data would indicate returns that are commensurate with the long-term average. However, in its recent Draft Decisions, the AER has allowed a return on equity that is lower than at any time on record.

[101] Envestra Draft Decision, Appendix B, pp. 45-46.
[102] Envestra Draft Decision, Appendix B, pp. 45-46.

Conclusions

202. It is our view that the only reasonable interpretation of the empirical data is that equity risk premiums remain at elevated levels. The most direct piece of evidence is the fact that debt risk premiums remain near their historical highs. It is implausible to suggest that the same market for funds would require materially higher than average risk premiums when investing in debt securities but not when investing in equity securities. Dividend yields and P/E ratios also indicate that required returns on equity are higher than average.

203. When interpreting this data, it is important to note that, in its recent Draft Decisions, the AER does not suggest that the required return on equity is comparable to the long-run average. Rather, the AER proposes that the required return on equity is currently lower than at any time on record. Consequently, the observable data would only support the return on equity that has been allowed in the Draft Decisions if it also indicated that required returns were at historical lows. In our view, no reasonable interpretation of any of the observed data would support such an interpretation, and the resulting estimate cannot reasonably be considered to be commensurate with the prevailing conditions in the market for funds.

8. The AER's reasonableness checks on the overall rate of return

Overview

204. In its recent Draft Decisions, the AER performs certain cross checks to determine whether the overall rate of return it proposes to allow the service providers is reasonable, having regard to other evidence. In performing these reasonableness checks, the AER examines:[103]

    a) recent asset sales involving regulatory assets;

    b) trading multiples;

    c) broker WACC estimates;

    d) recent decisions by other regulators and the AER;

    e) recent decisions by overseas regulators; and

    f) the relationship between the cost of equity and the cost of debt.

205. For example, in its recent Draft Decisions, the AER concludes that the overall rate of return that it proposes to allow for Envestra, 7.16%, is commensurate with the prevailing conditions in the market for funds, having regard to the above reasonableness checks.[104]

206. The AER notes that it does not estimate individual parameter inputs to the nominal vanilla WACC or the overall rate of return by reference to these metrics. Rather, they are examined simply to verify that the overall rate of return is economically reasonable and commensurate with the prevailing conditions in the market for funds.[105]

207. We agree with the AER that it is appropriate to perform reasonableness checks to verify that the overall rate of return is commensurate with prevailing conditions in the market for funds and the risks involved in providing reference services, as required by s. 87 of the NGR. However, the implementation of the cross checks applied by the AER, and the weight assigned to the results of them, must reflect the limitations that affect some of these tests.

208. In the sections that follow, we consider some of the sources of evidence that the AER relies upon in performing its reasonableness checks and outline the limitations that affect the application of these checks and the weight that should be applied to their results.

Recent sales of regulated assets

209. In its recent Draft Decisions, the AER notes that recent regulated asset sales have generally been at a premium to the regulated asset base (**RAB**), as reflected by a multiple of sale proceeds to RAB exceeding one.[106] From this fact, the AER infers that:[107]

[103] Envestra Draft Decision, Appendix B, pp. 148-149.
[104] Envestra Draft Decision, Appendix B, p. 149.
[105] Envestra Draft Decision, Appendix B, p. 119.
[106] Envestra Draft Decision, p. 149.
[107] Envestra Draft Decision, Appendix B, p. 56.

> If the market value is above the book value, this may imply that the regulatory rate of return is above that required by investors.

210. The AER then concludes that:

> This evidence provides the AER with a degree of confidence that its current approach in calculating the rate of return is reasonable.[108]

211. However, a sale price in excess of the RAB does not inevitably establish that the regulatory rate of return exceeds that required by investors. Rather, sales of regulated assets at a premium to the RAB could reflect a myriad of factors, including, but not limited to:

a) The acquirer's expectation of potential future growth in earnings from the operation of the regulated assets, whether because of an increase in demand for regulated services, howsoever arising, or because of an expectation that regulation will be relaxed;

b) The acquirer's perception that acquiring the asset would confer certain intangible or strategic benefits of value to the acquirer. This could be the case if, for instance, the purchase of a regulated asset granted a foreign investor entry to a market that they perceive to be of strategic importance;

c) The inclusion of certain non-regulated assets that are of value to the acquirer in the sale;

d) The acquirer's expectation that they could exploit synergies between their existing business and the regulated asset that lead to increased revenues or reduced costs; or

e) The possibility that certain efficiencies might be available to the acquirer that are not available to an efficient benchmark service provider.

212. The AER appears to acknowledge that the above factors, and indeed, several others, could explain the observation of asset sales at a premium to the RAB just as well as the possibility that the allowed regulatory rate of return exceeds that required by investors. In its recent Draft Decisions, the AER states that:[109]

> Caution must be exercised before inferring that the difference indicates a disparity in WACCs, particularly where the difference is small. A range of factors may contribute to a difference between market and book values. A RAB multiple greater than one might be a result of the buyer:
>
> - expecting to achieve greater efficiency gains that result in actual operational and capital expenditure below the amount allowed by the regulator;
> - increasing the service provider's revenues by encouraging demand for regulated services;
> - benefiting from a more efficient tax structure or higher gearing levels than the benchmark assumptions adopted by the regulator, and growth options;

[108] Envestra Draft Decision, p. 119.
[109] Envestra Draft Decision, Appendix B, p. 56.

> ▪ expecting to achieve higher returns if regulation is relaxed.

213. We agree with the AER that each of (or some combination of) the above factors could explain the observation of regulated asset sales at a premium to the RAB. Moreover, asset transactions usually embed a material control premium. Which of the these factors are operative in any particular transaction, however, is difficult to determine. Certainly, the proportional contribution of each of these factors on the premium paid in any transaction cannot be quantified with any degree of accuracy sufficient to render the exercise informative.

214. In addition to these factors that limit the conclusions that can be drawn from the observation of sales of regulatory assets at a premium to the RAB, the AER also notes that:[110]

> Regulated asset sales in the market are also infrequent, allowing limited opportunity to conduct this analysis.

215. We also note that the transaction data also suffers from the further limitation that much of it is now out-dated. Of the ten transactions examined by the AER, half occurred in 2006, preceding the GFC and the European sovereign debt crisis. To the extent that the prevailing conditions in the market now differ from the conditions in the market in 2006, transactions completed in 2006 would be of little relevance to any current determination.

216. Moreover, the issue at hand is the reasonableness of the allowed returns in the AER's recent Draft Decisions. Those Decisions allow a return on equity below 8% for the first time ever. The allowed return on equity was materially higher at the time of the historical transactions. Consequently, it is not clear what those historical transactions can tell us about the reasonableness of the AER's current Decisions.

217. Despite the limitations on regulated asset sales as a meaningful cross-check on the overall rate of return, the AER concludes that:

> Regulated asset sales do, however, provide a useful real-world indication of whether market participants consider the AER's benchmark WACC to be broadly speaking, reasonable.[111]

218. In our view, the problems set out above so profoundly limit the inferences that can be drawn from regulated asset sales with respect to the adequacy of the regulatory cost of capital that this information cannot be usefully used to check the reasonableness of the current regulatory WACC.

Trading multiples

219. The AER also examines trading multiples, a measure of the share price of a regulated firm divided by its RAB (expressed on a per share basis), as a check on the reasonableness of the proposed regulatory cost of capital. Applying a similar logic to that advanced for considering recent asset sales, the AER states that:

[110] Envestra draft decision, Appendix B, p 56.
[111] Envestra draft decision, Appendix B, p 56.

> As with regulated asset sales, a trading multiple above one may imply that the market discount rate is below the regulated WACC.[112]

220. However, as was the case for the transaction multiples, a trading multiple above one does not inevitably establish that the regulatory rate of return exceeds that required by investors. Rather, trading multiples above one could reflect a myriad of factors, including, but not limited to:

    a) The contribution of strongly performing non-regulated assets owned by a regulated firm;

    b) The ability of the regulated firm to extract efficiency gains and exploit economies of scale that result in actual operational and capital expenditure below the amount allowed by the regulator;

    c) The potential for growth in the earnings of the regulated firm, whether arising from non-regulated business units or from efforts to increase the demand for regulated services;

    d) The potential for a regulated firm to exploit tax shields by maintaining a capital structure which differs from that assumed in the regulatory framework; and

    e) The possibility that an acquirer might be prepared to pay a premium for the firm's assets, for instance, because there may be synergies with the acquirer's existing business or because gaining entry to that particular market is of strategic importance to the acquirer.

221. That these factors could equally explain a trading multiple above one appears to be uncontentious. For instance, McKenzie and Partington (2011) note that:

> The source of this value premium could arise from economies of scale and synergies in general, from the opportunities for efficiency gains, from opportunities for growth, from the potential to exploit tax shields, or because the allowed regulated return is above the return really required. It is difficult to attribute the value premium across these components.[113]

222. The AER also acknowledges that such factors limit the inferences that can be drawn from trading multiples. In its recent Draft Decisions, the AER states:

> The same cautions with interpreting the results of the regulated asset sales approach apply to trading multiples. In addition, this assessment relies on the assumption that share prices reflect the fundamental valuation of the company.[114]

223. Thus it is clear, that a trading multiple exceeding one is not a sufficient condition to justify the conclusion that the regulatory rate of return exceeds the rate of return required by investors.

224. Indeed, as a matter of logic, a trading multiple exceeding one is neither a necessary nor a sufficient condition for the conclusion that the regulatory rate of return is higher than the market discount rate. A regulated firm could trade at a discount to its RAB although the regulatory rate of return exceeds

[112] Envestra Draft Decision, Appendix B, p. 59.
[113] McKenzie and Partington (2011), p. 34.
[114] Envestra Draft Decision, Appendix B, p. 59.

the rate required by investors because, for instance, the firm also operates certain underperforming unregulated business units that are cross-subsidised by the profitable regulated assets.

225. Moreover, uncertainty surrounding the manner in which the trading multiples examined by the AER are estimated further limits the inferences that can be drawn from them. The AER states that the multiples, taken from brokerage reports, are estimated as:

> A comparison of the asset value implied by share prices against the regulatory asset base.[115]

226. The precise nature of these calculations should be spelled out. For example, what adjustment is made for unregulated assets, and what adjustment is made for the fact that the share price reflects the value of equity whereas the RAB reflects the value of assets?

227. Despite these limitations, the AER concludes that trading multiples provide a reasonable cross check for its proposed regulatory cost of capital. In our view, the difficulties set out above lead to the conclusion that trading multiples cannot be usefully used to check the reasonableness of the current regulatory WACC.

Broker WACC estimates

228. The use of broker WACC estimates as a source of evidence with respect to the actual cost of capital faced by regulated businesses is subject to many known limitations. In its recent Draft Decisions, the AER acknowledges these limitations, noting that:

> - the broker reports generally do not state the full assumptions underlying their analysis, or provide thorough explanations of how they arrive at their forecasts and predictions. As such, caution should be exercised in the interpretation of these broker reports;
> - the five listed companies considered undertake both regulated and unregulated activities, which are assessed by brokers in aggregate. However, only the regulated activities are directly relevant to the risk in providing reference services…
> - it is generally not clear what assumptions the brokers have relied upon when developing their WACC estimate. Further, variation in WACC estimates suggests that these assumptions are not consistent across the different brokers; and
> - the broker reports do not always provide sufficient information for the AER to calculate a nominal vanilla WACC estimate. Only those brokers who report the WACC in nominal vanilla form or provide sufficient detail to enable conversion to this form were considered. These figures are not necessarily precise estimates of the broker's nominal vanilla WACC, since the AER has relied on its interpretation of the information provided.[116]

229. The Tribunal also noted these limitations in the recent Envestra matter, but determined that the AER's use of broker WACC estimates did not give rise to a reviewable error on the basis of their limited use and their application as an output test, rather than as an input to the calculation of the WACC.[117]

[115] Envestra Draft Decision, Appendix B, p. 59.
[116] Envestra Draft Decision, Appendix B, p. 62.
[117] Australian Competition Tribunal, Application by Envestra Ltd (No 2) [2012] AComp T 3, 11 January 2012, Paragraph 166.

230. Noting the reasoning of the Tribunal on this point, in its recent Draft Decisions the AER states that:

> Consistent with its approach in previous decisions, the AER uses broker WACC estimates as a reasonableness check on the overall rate of return.[118]

231. In summary, broker WACC estimates are to be used only as a reasonableness check on the regulatory allowed return, and the weight applied to the result of this exercise should reflect the problems set out above.

232. In its recent Draft Decisions, the AER notes that the range of broker WACC estimates in its sample is 7.76% – 10.02%, and that its proposed allowed WACC of 7.16% is 173 basis points below the mid-point of the range and 60 basis points below the minimum value in this range. From this, the AER concludes:

> Broker WACC estimates do not demonstrate that the overall rate of return, which is based on the analysis of individual parameters, is not commensurate with prevailing conditions in the market for funds and the risks involved in providing reference services.[119]

233. This conclusion begs the question of how a reasonableness check should properly be applied and interpreted. In the case at hand we have the regulatory estimate being checked for reasonableness against a number of alternate (broker) estimates. The regulatory estimate is below the entire range of alternate estimates – it is even materially below the minimum of all alternate estimates. In our view, this should not be interpreted as confirming the reasonableness of the regulatory estimate.

234. Indeed, if this evidence does not lead one to question the reasonableness of the regulatory estimate, it would seem that no evidence would ever do so.

Recent decisions by the AER and other regulators

235. In its recent Draft Decisions, the AER states that:

> The AER reviews a range of returns it approved for other gas and electricity service providers and also the rates of return in recent decisions by other Australian regulators. This provides a test of the reasonableness of the rate of return in this determination.[120]

236. There is clearly a degree of circularity involved in checking the reasonableness of the AER's current decision against the AER's previous decisions. Such a process would have the potential to perpetuate and even compound errors in the decision making process. Similarly, where other regulators have adopted an approach or a parameter value on the basis that the AER had adopted that approach or parameter value, the decision of the other regulator should not be considered to provide a meaningful independent cross check of the reasonableness of the AER's decisions.

[118] Envestra Draft Decision, Appendix B, p. 62.
[119] Envestra Draft Decision, Appendix B, p. 63.
[120] Envestra Draft Decision, Appendix B, p. 63.

9. Regulatory and commercial approaches for determining a reasonable estimate of the required return on equity

Overview and context

237. In the foregoing sections of this report, we note that the procedures the AER has adopted in its recent Draft Decisions have produced an estimate of the required return on equity that is lower than any previous estimate on record. We have also set out our view that such a conclusion, when assessed against all of the relevant evidence, is neither reasonable nor plausible nor commensurate with the prevailing conditions in the market for funds. And we have set out a number of aspects of the Draft Decisions that we consider to be in error.

238. In this section, we note that other Australian regulators have also reached the conclusion that it would be wrong, in light of the relevant evidence, to set the allowance for the return on equity to its lowest level ever. We also examine the approach that has been taken to ensure that the allowed return on equity is reasonable and commensurate with the prevailing conditions in the market for funds.

NSW retail electricity prices

239. In its recent Review of Retail Electricity Prices, IPART noted that stakeholders submitted:

> that there is a negative relationship between the risk free rate and the MRP. In periods of high investor risk aversion, there is a flight from risky assets to safe assets, or a 'flight to quality'. This tends to push up the price and push down the yields on safe assets. For this reason, falling risk free rates tend to be associated with rising investor risk premiums (and vice versa). The use of the short term measure of the risk free rate and the long term MRP have resulted in a situation where the reduced yield on the risk free rate has been reflected in the WACC, but the corresponding increase in the MRP has not.[121]

240. After considering this issue, IPART concluded that:

> We note that there may be an inconsistency between using short term data for the risk free rate and using long term data for the MRP. As stakeholders have noted, there may be an inversely proportional relationship between the MRP and the risk free rate.[122]

and that:

> In the current market circumstances, there is some evidence to support the view that expectations for the MRP have risen as bond yields have fallen.[123]

and further that:

[121] IPART Retail Electricity Final Decision, p. 104.
[122] IPART Retail Electricity Final Decision, p. 107.
[123] IPART Retail Electricity Final Decision, p. 107.

> we recognised that there may be a discrepancy between the use of short term yields on the risk free rate and long term averages for the MRP, particularly in the current market.[124]

Tribunal precedent

241. IPART further noted that the Australian Competition Tribunal has also previously recognised that a contemporaneous estimate of the risk-free rate would be consistent with a contemporaneous estimate of MRP (one that is commensurate with the prevailing conditions in the market for funds) and would be inconsistent with a long-run average estimate of MRP (which would be consistent with the average conditions in the market for funds over a long historical period):

> We note that the ACT varied the AER's final determination because "the Tribunal considers that an averaging period during which interest rates were at historically low levels is unlikely to produce a rate of return appropriate for the regulatory period."[125]

242. The Tribunal case that considers the relationship between government bond yields and the market risk premium is the Energy Australia Case.[126] One of the applicants in that case, TransGrid, was regulated under Chapter 6A of the National Electricity Rules, which required the risk-free rate to be estimated using appropriate market data, whereas estimates of beta and market risk premium were fixed and could not be changed.

243. TransGrid submitted that there was a clear relationship between government bond yields and risk premiums in financial markets and that adding a long-run average estimate of MRP to an historically low estimate of the risk-free rate would produce a nonsensical outcome – it would imply that equity finance was cheaper than it had ever been, right at the peak of the GFC.

244. Because the Rules required a "normal" estimate of MRP to be used, TransGrid proposed to use an estimate of the risk-free rate from "normal" times, rather than the highly unusual estimate from the time of the determination – so that the two parameters were estimated consistently in order to produce a sensible estimate of the required return on equity. The AER insisted on estimating the risk-free rate as the yield on government bonds at the time of the determination – and then adding the fixed long-run average estimate of MRP.

245. The Tribunal noted that:

> The Applicants submitted that these facts demonstrated that basing a risk free rate on the AER's specified averaging periods would not achieve the objective of an unbiased rate of return consistent with market conditions at the date of the final decision. They appealed to expert opinion that the market risk premium was far higher than its deemed value while the risk free rate was abnormally low, so that the return required by investors was much higher than the AER's specified averaging period would generate.[127]

and concluded that:

[124] IPART Retail Electricity Final Decision, p. 107.
[125] IPART Retail Electricity Final Decision, p. 108.
[126] [2009] ACompT 8.
[127] [2009] ACompT 8, Paragraph 112.

> The Tribunal considers that an averaging period during which interest rates were at historically low levels is unlikely to produce a rate of return appropriate for the regulatory period.[128]

246. The Tribunal allowed TransGrid to use an estimate of the risk-free rate drawn from more normal times, to be consistent with the long-run average estimate of MRP that was required under the Rules.

IPART approach – ensuring consistency of risk-free rate and MRP

247. The regulatory framework governing IPART's review of retail electricity prices effectively requires that its previous estimate of MRP (a range of 5.5% to 6.5%) must be maintained and that a contemporaneous estimate of the risk-free rate must also be used.[129] However, as set out above, IPART recognised that:

    a) an estimate of the risk-free rate that is commensurate with the prevailing conditions in the market for funds; paired with

    b) an estimate of MRP that is commensurate with the average conditions in the market for funds over the last 50 years

    would give rise to an inconsistency that is likely to produce an inappropriate estimate of the required return on equity, "particularly in the current market."

248. Consequently, IPART worked within its regulatory constraints to produce a more sensible and appropriate outcome. Specifically, IPART selected a final WACC estimate from near the top of the reasonable range that it had estimated. IPART explains that:

> we have not selected the midpoints of the ranges for our point estimate of the WACC values. The methodology set down in our 2010 determination required the use of short term averages for the market-based parameters, and long term averages for other parameters. As noted by some stakeholders, there could potentially be a disparity between using short term averages of market data for some parameters and long term averages for others. The risk free rate has been affected by market volatility and prolonged weak market conditions. The change in market conditions has potentially created a disparity between the risk free rate (for which we use short term averages) and the MRP (for which we use long term averages). In the current market circumstances, there is some evidence to support the view that expectations for the MRP have risen as bond yields have fallen. However, it is difficult to measure these short term variations in expectations for the MRP.[130]

and that:

> We selected a point estimate towards the upper end of the range of values after considering the long term WACC estimates.[131]

[128] [2009] ACompT 8, Paragraph 114.
[129] IPART estimated the risk-free rate and MRP with reference to the yield on 10-year Commonwealth Government Securities.
[130] IPART Retail Electricity Final Decision, p. 102.
[131] IPART Retail Electricity Final Decision, p. 103.

as illustrated in Figure 12 below.

Figure 8. IPART approach – Retail Electricity

Table B.2 Short term and long term WACC calculation

WACC parameters	Final decision		Long term average	
	Generation	Retail	Generation	Retail
Nominal risk free rate	3.7%	3.7%	5.4%	5.4%
Inflation adjustment	2.8%	2.8%	2.5%	2.5%
Market risk premium	5.5% to 6.5%	5.5% to 6.5%	5.5% to 6.5%	5.5% to 6.5%
Debt margin	2.1% to 3.6%	2.1% to 3.6%	2.0%	2.0%
Debt to total assets	50%	30%	50%	30%
Gamma	0.5 to 0.3	0.5 to 0.3	0.5 to 0.3	0.5 to 0.3
Tax rate	30%	30%	30%	30%
Equity beta	0.9 to 1.1	0.9 to 1.1	0.9 to 1.1	0.9 to 1.1
Cost of equity	8.6% to 10.8%	8.6% to 10.8%	10.4% to 12.6%	10.4% to 12.6%
Cost of debt	5.8% to 7.3%	5.8% to 7.3%	7.4%	7.4%
WACC range (pre-tax real)	5.0% to 7.4%	5.8% to 8.7%	7.1% to 8.9%	8.0% to 10.6%
WACC midpoint (pre-tax real)	**6.2%**	**7.2%**	**8.0%**	**9.2%**
WACC point estimate (pre-tax real)	**7.1%**	**8.0%**	**na**	**na**

Source: IPART, Sydney Retail Electricity Final Decision, p. 104.

249. That is, IPART has used an approach for increasing its estimate of the required return on equity by selecting a WACC estimate from above the mid-point of what it considers to be a reasonable range:

> Rather than adjusting the risk free rate or revaluing the MRP, we made a judgment when selecting the WACC point estimate from within the range.[132]

250. It is possible to reverse-engineer the estimates of the risk-free rate or MRP that would be required to produce the WACC point estimate adopted by IPART. For example, IPART adopts a pre-tax real WACC estimate of 7.1% for electricity generation businesses. This implies a required return on equity of 11.2%.[133] This estimate of the required return on equity is consistent with either:[134]

a) Increasing the risk free rate from the contemporaneous estimate of 3.7% to a longer-term average estimate of 5.2%[135]; or

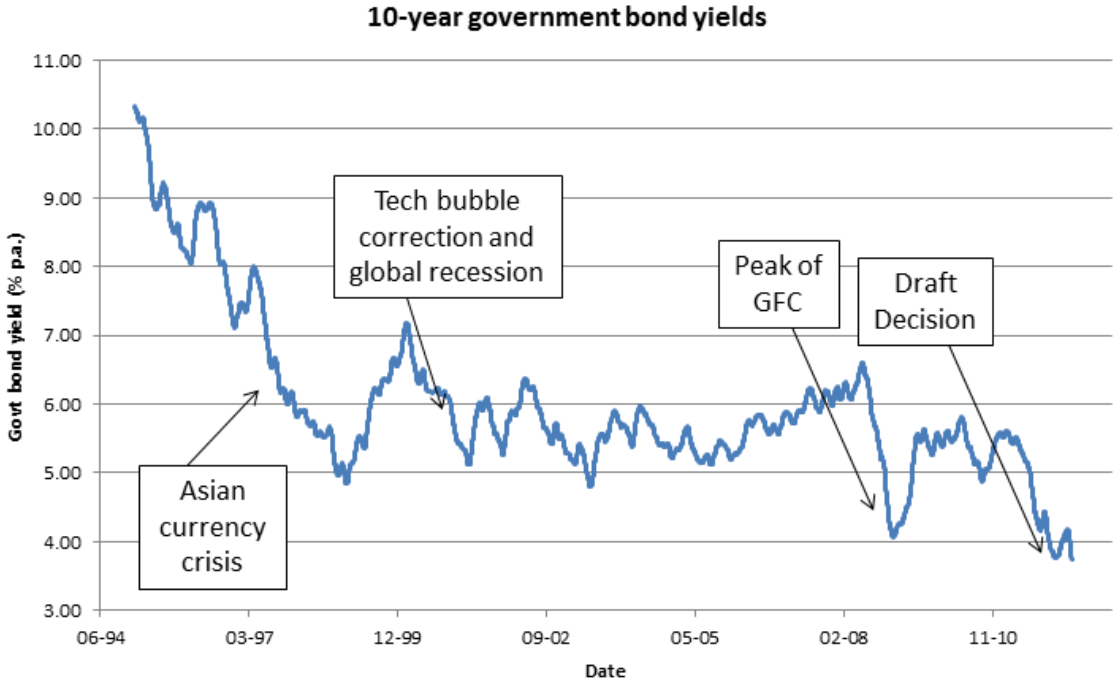
b) Adopting a contemporaneous MRP estimate of 7.5%.[136]

[132] IPART Retail Electricity Final Decision, p. 107.
[133] That is, if the required return on equity is set to 11.2% and all other parameters are set to their mid-point estimates, the pre-tax real WACC estimate is 7.1%.
[134] We note that IPART does not *formally* change any individual parameter estimate. Rather, it selects an overall estimate of the required return on equity that it considers to be reasonable and appropriate in light of all of the relevant evidence. Within the context of the Sharpe-Lintner CAPM, this final estimate of the required return on equity is consistent with the use of a higher point estimate of either the risk-free rate or MRP, as set out below.
[135] Under the CAPM, 5.2% + 1.0 × 6% = 11.2%.

Submissions to IPART

251. A number of factors led IPART to conclude that it should increase the allowed return on equity as a result of government bond yields being at historical lows. First, there is clear evidence that government bond yields tend to decline during periods of financial crisis, as set out in Figure 9 below, which shows the time series of 20-day moving average of the yield on 10-year Commonwealth Government bonds.

Figure 9. 10-year government bond yields



Source: Reserve Bank of Australia.

252. Second, it is well-known, and generally accepted by finance academics and financial market professionals, that periods of historically low government bond yields are caused by a phenomenon known as a "flight to quality." During periods of market turmoil and uncertainty, many investors are willing to pay a premium for "safe haven" assets such as government bonds in developed economies. That is, many investors sell out of higher-risk investments and "park" funds in government bonds. This bids up the price of government bonds and pushes yields down to very low levels.

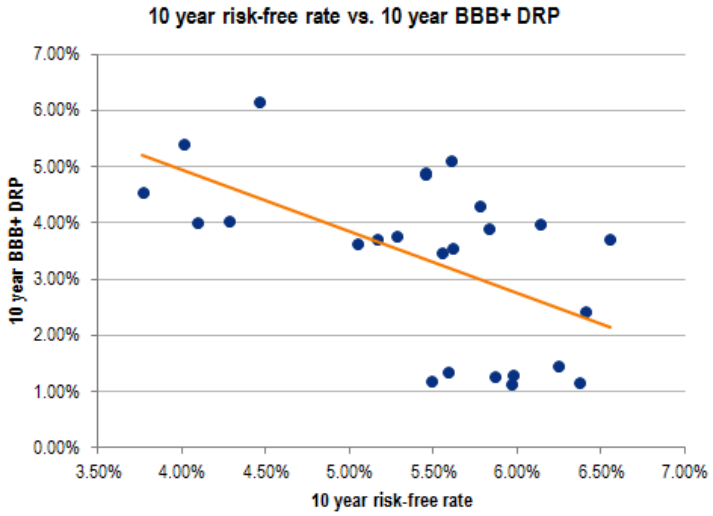
253. The flight-to-quality effect implies that government bond yields are likely to be at their historical lows at precisely the same time that risk premiums are at their historical highs. Figure 9 above shows that government bond yields were driven down sharply during the Asian currency crisis in 1997 and during the bursting of the tech bubble and global recession in early 2001.

254. The previous record low for Australian 10-year government bond yields was during the height of the Global Financial Crisis, but even that low has been surpassed in recent times due to developments in the European debt crisis.

[136] Under the CAPM, 3.7% + 1.0 × 7.5% = 11.2%.

255. Queensland Treasury Corporation (**QTC**) have also examined the relationship between 10-year Commonwealth Government bond yields and risk premiums in financial markets. Figure 10 below shows the relationship between 10-year government bond yields and estimates of the 10-year debt risk premium.[137] That figure shows that debt risk premiums are heightened when government bond yields are very low. That is, at times when investors are requiring high premiums for bearing risk, government bond yields tend to be very low – consistent with a flight-to-quality effect.

Figure 10. Inverse relationship between government bond yields and risk premiums in financial markets

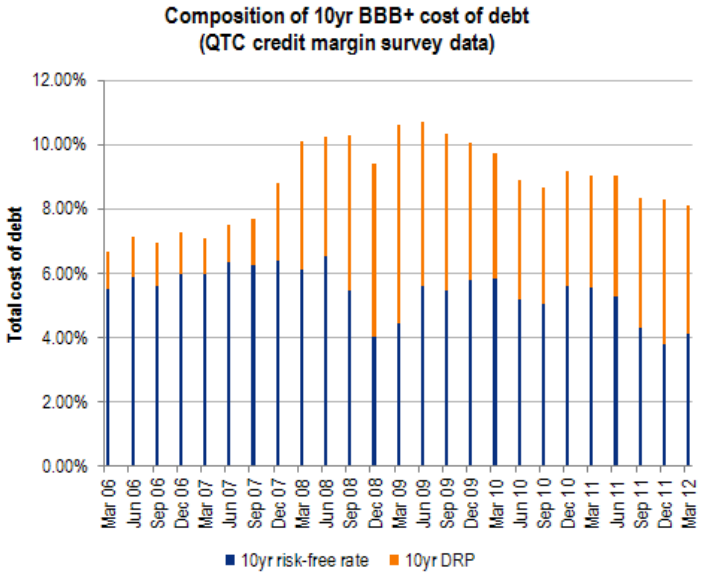


Source: Queensland Treasury Corporation.
The debt risk premium is based on QTC's quarterly credit margin survey data.
The data in the figure is from the March 2006 to the March 2012 QTC surveys.

256. QTC also show that the total corporate bond yield is much more stable over time than either of its component parts – the 10-year government bond yield and the DRP. Figure 11 below shows that changes in government bond yields are largely offset by changes (in the opposite direction) in debt risk premiums and vice versa. That is, the total return required by investors has been more stable over time than either of the component pieces.

[137] The debt risk premium is based on QTC's quarterly credit margin survey data. The data in the figure is from the March 2006 to the March 2012 QTC surveys.

Figure 11. Offsetting effect of government bond yields and risk premiums in financial markets



Source: Queensland Treasury Corporation.
The debt risk premium is based on QTC's quarterly credit margin survey data.
The data in the figure is from the March 2006 to the March 2012 QTC surveys.

Sydney desalination plant

257. In its review of the Sydney Desalination Plant, IPART specifically recognised the disparity that may arise in certain market circumstances if a long-term historical estimate of MRP is paired with a short-term contemporaneous estimate of the risk-free rate:[138]

> The risk free rate and debt margin have been affected by market volatility and the prolonged weak market following the credit crisis of 2008. The change in these factors has potentially created a disparity between these parameters (for which we use short term average data) and the market risk premium (for which we use long term average data). However, the effects of this disparity are mitigated by our decision to use a point estimate of 6.7%, which is 80 basis points higher than the midpoint of our estimated WACC range. In doing so, we had strong regard to the calculated WACC using longer term averages for market parameters.[139]

258. IPART went on to state that the required return on equity is likely to be more stable than each of its component pieces (risk-free rate and MRP):

> We acknowledge the argument that there may be greater stability in the sum of the market risk premium and the risk free rate (ie, the expected market return) than in the individual components.[140]

[138] IPART used 5-year government bond yields as a proxy for the contemporaneous risk-free rate in this case.
[139] IPART, Sydney Desalination Plant Final Decision, p. 80.
[140] IPART, Sydney Desalination Plant Final Decision, p. 94.

259. IPART concluded that pairing a long-term historical average estimate of MRP with a contemporaneous estimate of the risk-free rate in the current Australian market would produce an unreasonable outcome, in which case a different approach would be required. IPART concluded that its:

> approach is to look at the long term averages as a reference point for the sum of the market risk premium and risk free rate.[141]

260. The standard regulatory approach is to estimate the required return on debt as the sum of contemporaneous estimates of the risk-free rate and DRP. As set out above, risk-free rates and financial risk premiums tend to move in opposite directions, offsetting one another, so that the total required return remains relatively stable. In the Sydney Desalination case, the total required return on debt was identical whether a pair of historical estimates or a pair of contemporaneous estimates was used. The fall in the contemporaneous risk-free rate was exactly offset by the increase in the risk premium, as set out in Table 4 below.

Table 4. Sydney Desalination Plant: Regulatory estimates of the required return on debt

	Historical estimates	Contemporaneous estimates
Risk-free rate	5.40%	3.90%
Risk premium	2.00%	3.50%
Total required return	7.40%	7.40%

Source: IPART, Sydney Desalination Plant Final Decision, p. 95.

261. In the Sydney Desalination Plant case, IPART recognised (as set out above) that in the prevailing market conditions there would be a disparity between a contemporaneous estimate of the risk-free rate and its standard fixed estimate of MRP. Table 5 below shows that the (then) contemporaneous risk-free rate of 3.9% paired with a constant 6% estimate of MRP would imply a required return on equity of 9.9% p.a. for the average firm.[142] IPART considered this to be unreasonable and instead adopted a WACC point estimate that was consistent with using the average values (computed over 10 years[143]) of its parameter point estimates. These longer-run parameter estimates produce a value of 11.4% for the required return on equity for the average firm.[144]

262. Figure 12 below shows an extract from the relevant Final Decision. Earlier in the Final Decision,[145] IPART had shown that the approach of pairing a contemporaneous estimate of the risk-free rate (3.9%) with IPART's standard long-run average estimate of MRP (5.5-6.5%) produces a WACC point estimate of 5.9% (pre-tax real). IPART rejected that approach on the basis that it did not, in the current market conditions, produce a reasonable output. Instead, IPART adopted a WACC

[141] IPART, Sydney Desalination Plant Final Decision, p. 94.
[142] That is, a firm with an equity beta of 1.0.
[143] Confirmed to me in an email from IPART, dated 1 November 2012.
[144] The long-run average mid-point estimates of the risk-free rate and MRP are 5.4% and 6% respectively. Under the CAPM, the average firm (with equity beta of 1.0) then has a required return of 11.4%.
[145] IPART, Sydney Desalination Plant Final Decision, p. 94.

estimate of 6.7% having "strong regard to the calculated WACC using longer term averages for market parameters,"[146] according to the last column in the table below.

Figure 12. IPART approach – Sydney Desalination Plant

Table 9.5 SDP's proposed WACC compared to and IPART's estimate of the WACC using long term averages of parameters

WACC parameters	SDP's proposal	IPART parameters under long term average parameters
Nominal risk free rate	5.2%	5.4%
Inflation adjustment	2.6%	2.5%
Market risk premium	6.0%	5.5% to 6.5%
Debt margin	3.42%	2.0%
Debt to total assets	60%	60%
Dividend imputation factor (gamma)	0.25	0 – 0.5
Tax rate	30%	30%
Equity beta	0.9	0.6 – 0.8
Cost of equity (nominal post-tax)	10.6%	8.7% to 10.6%
Cost of debt (nominal pre-tax)	8.62%	7.4%
WACC (nominal pre-tax) point estimate	10.6%	9.2%
WACC range (real pre-tax)	N/A	5.9% to 7.8%
WACC (real pre-tax) midpoint estimate	**7.8%**	**6.7%**

Source: SDP's submission to IPART's review of prices for SDP, p 21, Table 4.1, and Bloomberg data.

Source: IPART, Sydney Desalination Plant Final Decision, p. 95.

263. This estimate of the required return of the average firm is consistent with either:

a) Increasing the risk free rate from the contemporaneous estimate of 3.9% to a longer-term average estimate of 5.4%; or

b) Adopting a contemporaneous MRP estimate of 7.5%.

264. We note that IPART did not *formally* change any individual parameter estimate. Rather, it selected an overall estimate of the required return on equity that it considered to be reasonable and appropriate in light of all of the relevant evidence. Within the context of the Sharpe-Lintner CAPM, this final estimate of the required return on equity is consistent with the use of a higher point estimate of either the risk-free rate or MRP, as set out in the table below.

[146] IPART, Sydney Desalination Plant Final Decision, p. 95.

Table 5. Sydney Desalination Plant:
Regulatory estimates of the required return on equity for the average firm

	Mixed estimates	Historical estimates	Contemporaneous estimates
Risk-free rate	3.90%	5.40%	3.90%
Risk premium	6.00%	6.00%	7.50%
Total required return	9.90%	**11.40%**	**11.40%**

Source: IPART, Sydney Desalination Plant Final Decision, p. 95.
SFG calculations.

Sydney Water

265. In its review of Sydney Water, IPART again recognised the disparity that may arise in certain market circumstances if a long-term historical estimate of MRP is paired with a short-term contemporaneous estimate of the risk-free rate:[147]

> The risk free rate has been affected by market volatility and prolonged weak market conditions. The change in these factors has potentially created a disparity between the risk free rate (for which we use short-term average data) and the market risk premium (for which we use long-term average data). In the current market circumstances, there is some evidence to support the view that expectations for the market risk premium have risen as bond yields have fallen. However, it is difficult to measure these short-term variations in expectations for the market risk premium. To guide our decision making on the point estimate for the WACC we estimated the long-term averages of the risk free rate, debt margin, inflation adjustment and the market risk premium.[148]

266. IPART went on to explain that:

> We note that there may be an inconsistency between using short-term data for the market-based parameters and using long-term data for the MRP and the equity beta. In particular, there may be an inversely proportional relationship between the MRP and the risk free rate. In periods of high investor risk aversion, there is a flight from risky assets to safe assets. This tends to push up the price and push down the yields on safe assets. For this reason, falling risk free rates tend to be associated with rising investor risk premiums (and vice versa).[149]

267. IPART concluded that pairing a long-term historical average estimate of MRP with a contemporaneous estimate of the risk-free rate in the current Australian market would produce an unreasonable outcome, in which case a different approach would be required. IPART concluded that its:

> We have addressed the potential problem of combining a long-term average for the MRP and a short-term average for the risk free rate by having regard to the long term averages for both in choosing a WACC at the top end of the current range.[150]

[147] IPART used 5-year government bond yields as a proxy for the contemporaneous risk-free rate in this case.
[148] IPART, Sydney Water Final Decision, p. 198.
[149] IPART, Sydney Water Final Decision, p. 210.
[150] IPART, Sydney Water Final Decision, p. 210.

268. In the Sydney Water case, IPART again recognised that in the prevailing market conditions there would be a disparity between a contemporaneous estimate of the risk-free rate and its standard fixed estimate of MRP. Again, we note that IPART did not *formally* change any individual parameter estimate. Rather, it selected an overall estimate of the required return on equity that it considered to be reasonable and appropriate in light of all of the relevant evidence. Within the context of the Sharpe-Lintner CAPM, this final estimate of the required return on equity is consistent with the use of a higher point estimate of either the risk-free rate or MRP, as set out in the table below.

269. Table 6 below shows that the (then) contemporaneous risk-free rate of 3.6% paired with a constant 6% estimate of MRP would imply a required return on equity of 9.6% p.a. for the average firm.[151] IPART considered this to be unreasonable and instead adopted a WACC point estimate that was consistent with using the average values (computed over 10 years[152]) of its parameter point estimates. These longer-run parameter estimates produce a value of 11.4% for the required return on equity for the average firm.[153]

270. Figure 13 below shows an extract from the relevant Final Decision. The first column shows that the approach of pairing a contemporaneous estimate of the risk-free rate (3.6%) with IPART's standard long-run average estimate of MRP (5.5-6.5%) produces a WACC point estimate of 4.6% (post-tax real). IPART rejected that approach on the basis that it did not, in the current market conditions, produce a reasonable output. Instead, IPART adopted a WACC estimate of 5.6% "by selecting a point estimate for the WACC which is closer to the WACC calculated using long-term averages,"[154] according to the last column in the table below.

Figure 13. IPART approach – Sydney Water

Table C.3 Rate of return using longer terms to maturity and sampling periods

	Final decision	Long term to maturity	Long term to maturity and sampling period
Nominal risk free rate	3.6%	4.1%	5.4%
Inflation adjustment	2.8%	3.0%	2.5%
Debt margin	3.3% to 4.8%	2.8% to 4.6%	2.0%
Market risk premium	5.5% to 6.5%	5.5% to 6.5%	5.5% to 6.5%
Gearing	60%	60%	60%
Gamma	0.25	0.25	0.25
Tax rate	30%	30%	30%
Equity beta	0.6 to 0.8	0.6 to 0.8	0.6 to 0.8
WACC range (post-tax real)	4.0% to 5.6%	4.0% to 5.7%	5.3% to 6.0%
WACC midpoint (post-tax real)	**4.6%**	**4.7%**	**5.6%**

Source: IPART analysis.

Source: IPART, Sydney Water Final Decision, p. 204.

271. IPART's estimate of the required return on equity for the average firm is consistent with either:

[151] That is, a firm with an equity beta of 1.0.
[152] Confirmed to me in an email from IPART, dated 1 November 2012.
[153] The long-run average mid-point estimates of the risk-free rate and MRP are 5.4% and 6% respectively. Under the CAPM, the average firm (with equity beta of 1.0) then has a required return of 11.4%.
[154] IPART, Sydney Water Final Decision, p. 204.

a) Increasing the risk free rate from the contemporaneous estimate of 3.6% to a longer-term average estimate of 5.4%; or

b) Adopting a contemporaneous MRP estimate of 7.8%.

272. Again, we note that IPART did not *formally* change any individual parameter estimate. Rather, it selected an overall estimate of the required return on equity that it considered to be reasonable and appropriate in light of all of the relevant evidence. Within the context of the Sharpe-Lintner CAPM, this final estimate of the required return on equity is consistent with the use of a higher point estimate of either the risk-free rate or MRP, as set out in the table below.

Table 6. Sydney Water: Regulatory estimates of the required return on equity

	Mixed estimates	Historical estimates	Contemporaneous estimates
Risk-free rate	3.60%	5.40%	3.60%
Risk premium	6.00%	6.00%	7.80%
Total required return	9.60%	**11.40%**	**11.40%**

Source: IPART, Sydney Water Final Decision, p. 204.
SFG calculations.

273. We also note that IPART has applied similar reasoning and a similar approach in its June 2012 review of prices for the Sydney Catchment Authority.[155]

Commercial approach

274. The approach set out above that pairs:

a) an historical average risk-free rate with an historical average MRP; or

b) a contemporaneous risk-free rate with a contemporaneous estimate of MRP,

is also one that is used in commercial practice.

275. For example, Dr Marc Zenner (Head of Corporate Advisory for JP Morgan) summarises the approach that he currently uses as follows:

> With my clients I show either:
>
> ▪ Using long term averages for everything (i.e., MRP, beta and risk free rate); or
>
> ▪ Using today's low rates but with today's relatively high MRP.
>
> Interestingly the estimates are not that different.
>
> If however they mix and match (i.e., today's low rates but long term average MRP) then indeed we have an unrealistically low cost of capital.[156]

[155] IPART, 2012, *Review of prices for the Sydney Catchment Authority: Final Report*, June, Appendix D.
[156] Email from Marc Zenner, Head of Corporate Finance Advisory, JP Morgan, New York, 4 November 2012.

10. Conclusions and recommendations

276. As documented above, we note that the procedures the AER has adopted in its recent Draft Decisions have produced an estimate of the required return on equity that is lower than any previous estimate on record. We have also documented our view that such a conclusion, when assessed against all of the relevant evidence, is neither reasonable nor plausible nor commensurate with the prevailing conditions in the market for funds. We have also set out a number of aspects of the Draft Decisions that we consider to be in error. The question then remains – what should be done to derive an estimate of the required return on equity that is reasonable and plausible, and which is commensurate with the prevailing conditions in the market for funds?

277. One option that is available is to follow the approach of other regulators such as IPART. IPART recognises that in the prevailing market conditions there would be a disparity between a contemporaneous estimate of the risk-free rate and its standard fixed estimate of MRP. It therefore adopts an overall return that is consistent with either:

    a) Using longer-run estimates of the risk-free rate and MRP; or

    b) Using contemporaneous estimates of both of these parameters.

278. IPART recognises that the approach adopted in the AER's Draft Decisions (mixing a contemporaneous estimate of the risk free rate with a long-run average estimate of MRP) does not produce an estimate of the required return on equity that is commensurate with the prevailing conditions in the market for funds. That is, the current conditions in the market for funds are unprecedented – government bond yields are lower than at any time on record and debt risk premiums remain near their all-time highs. The approach adopted by the AER in its Draft Decisions does not produce an estimate of the required return on equity that is commensurate with these unprecedented market conditions in the market for funds. IPART therefore adopts a different approach that is designed to produce an estimate of the required return on equity that *is* commensurate with the prevailing conditions in the market for funds.

279. In a series of recent decisions, IPART has adopted a WACC estimate that is consistent with an estimate of 11.4% for the required return of the average firm. This is consistent with an estimate of approximately 10.2% for the required return on equity for a firm with an equity beta of 0.8.[157]

280. We note that this estimate of the required return on equity is broadly consistent with our analysis summarised in Paragraph 86 above, where we conclude that investors in the shares of comparable firms would currently reasonably expect to receive a return of at least 10.5%.

[157] If longer-run historical averages are used for both parameters the Sharpe-Lintner CAPM produces a required return on equity of 5.4% + 0.8 × 6% = 10.2%.

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Appendix 1: Consistency between cash flow and discount rate adjustments for gamma

281. The following calculations set out the AER's implementation of the building block approach under the National Electricity Rules (**Rules**). The point of this exercise is to show that the adjustment in relation to franking credits that is required under the Rules is equivalent to the adjustment to the discount rate in Paragraph 60 above. The National Gas Rules are less prescriptive, so this appendix cites references to the National Electricity Rules and the AER's Post-tax Revenue Model (PTRM).

282. Rule 6.5.2(b) requires the use of the CAPM to estimate the required return on equity. In the Envestra Draft Decision, the AER implemented the CAPM as follows:

$$\begin{aligned} k_e &= r_f + \beta \times MRP \\ &= 2.98\% + 0.8 \times 6.0\% = 7.78\%. \end{aligned}$$

283. Rule 6.5.2(b) also requires that the required return on debt is to be calculated by adding a debt risk premium to the risk-free rate. In the Envestra Draft Decision, the AER's implementation of this step was as follows:

$$\begin{aligned} k_d &= r_f + DRP \\ &= 2.98\% + 3.76\% = 6.74\%. \end{aligned}$$

284. Rule 6.5.2(b) also requires the rate of return to be computed according to the nominal post-tax WACC formula that is usually called the "vanilla" WACC. In the Envestra Draft Decision, the AER's implementation of this step was as follows:

$$\begin{aligned} WACC &= k_e \frac{E}{V} + k_e \frac{D}{V} \\ &= 7.78\% \times 0.4 + 6.74\% \times 0.6 = 7.16\%. \end{aligned}$$

285. Consider a generic benchmark firm with initial RAB of 1,000. Consequently, the cash flow that must be available to provide a return to investors over the first year of the regulatory control period is:

$$7.16\% \times 1{,}000 = 71.6.$$

286. The amount of equity financing is 40% of the RAB, or 400. The return to equity holders is computed by multiplying the amount of equity by the required return on equity:[158]

$$7.78\% \times 400 = 31.1.$$

287. Rule 6.5.3 requires the estimated cost of corporate tax to be computed as a function of the pre-tax income, the corporate tax rate (30%), and the AERs assumed value of gamma (0.25) from the Draft Decision.

288. In the absence of certain firm-specific complexities,[159] the firm's pre-tax income is computed as:

[158] The amount of debt financing is 60% of the RAB, or 600. The return to debt holders is computed by multiplying the amount of debt by the required return on debt: $6.74\% \times 600 = 40.4$. Note that the return to equity plus the return to debt is equal to the total required return from applying the aggregated WACC to the RAB, as above: $31.1 + 40.4 = 71.6$.

$$ETI = \frac{Total\ Return\ to\ Equity}{(1-r(1-\gamma))} = \frac{31.1}{(1-0.3(1-0.25))} = 40.2$$

289. Rule 6.5.3 is then implemented as follows:[160]

$$\begin{aligned} ETC_t &= (ETI_t \times r_t)(1-\gamma) \\ &= (40.2 \times 0.3)(1-0.25) = 9.0. \end{aligned}$$

290. Rule 6.4.3 provides that the annual revenue requirement is to be computed as the sum of a number of "building block" components. For this illustration, we assume that regulatory depreciation is 50 and operating expenses are 100. We note that the choice of values for these two elements is irrelevant to the calculations being performed below as they simply wash out of the analysis – whatever these costs are, the revenue requirement is simply increased to accommodate them and the pre-tax profit, tax paid, and assumed value of franking credits is unchanged. The implementation of Rule 6.4.3 is then as follows:[161]

Return on Equity		31.1
Return on Debt		40.4
Regulatory Depreciation		50
Operating Expenses		100
Tax Payable	12.0	
Less Value of Imputation Credits	-3.0	9.0
Annual Revenue Requirement		**230.6**

291. Note that the estimated cost of corporate tax (8.3 in the last two rows of the table above) is *added* here and has the effect of *increasing* the annual revenue requirement. That is, annual revenues must be sufficient to pay the expected tax cost.

292. Now consider the equity holders, who are entitled to the residual cash flow, after all expenses have been met. The cash flow to equity holders is set out in the following table:

Total revenue	230.6
-Interest to debt holders	40.4
-Regulatory Depreciation	50
-Operating Expenses	100
-Corporate tax	12.0
Cash flow to equity	**28.1**

293. That is, the equity holders receive the residual cash flow of 28.1. In addition, the firm pays corporate tax of 12.0, which creates franking credits with a face value of 12.0. Each of these franking credits is assumed to be worth 25% of its face value, giving a total value of $0.25 \times 12.0 = 3.0$. The total return to equity holders is then:

[159] Such as a difference between tax and regulatory depreciation, and customer contributions that are outside the regulatory framework except for the effect they have on tax paid.

[160] The PTRM sets this out as the difference between corporate tax payable and the assumed value of franking credits. In this case, corporate tax payable is pre-tax income multiplied by the corporate tax rate $40.2 \times 0.3 = 12.0$ and the assumed value of franking credits is equal to the amount of tax paid (which is also the amount of franking credits created) multiplied by the assumed value of gamma $12.0 \times 0.25 = 3.0$ in which case the expected tax cost is $12.0 - 3.0 = 9.0$.

[161] Note that some items may not add exactly due to rounding.

$$\begin{aligned} \textit{Return to Equity} &= \textit{Residual Cash Flow} + \textit{Assumed Value of Franking Credits} \\ &= 28.1 + 3.0 = 31.1. \end{aligned}$$

294. Consequently the proportion of the total return to equity that is assumed to be delivered in the form of franking credits is:

$$\frac{\textit{Assumed Value of Franking Credits}}{\textit{Return to Equity}} = \frac{3.0}{31.1} = 9.7\%$$

295. Non-resident investors do not benefit from franking credits. Consequently, they receive only the 90.3% of the return to equity that is provided by means other than franking credits. This means that the return on equity available to non-resident investors is:

$$0.903 \times 7.78\% = 7.0\%.$$

296. Note that the return available to non-resident investors here is:

$$k_e \frac{1-T}{1-T(1-\gamma)} = 7.78\% \times \frac{1-0.3}{1-0.3(1-0.25)} = 7.0\%,$$

exactly as set out in Paragraph 60 above.

Appendix 2: Curriculum Vitae of Professor Stephen Gray

Stephen F. Gray

University of Queensland
Business School
Brisbane 4072
AUSTRALIA
Office: +61-7-3346 8032
Email: s.gray@business.uq.edu.au

Academic Qualifications

1995 Ph.D. (Finance), Graduate School of Business, Stanford University.
Dissertation Title: Essays in Empirical Finance
Committee Chairman: Ken Singleton
1989 LL.B. (Hons), Bachelor of Laws with Honours, University of Queensland.
1986 B.Com. (Hons), Bachelor of Commerce with Honours, University of Queensland.

Employment History

2000-Present	Professor of Finance, UQ Business School, University of Queensland.
1997-2000	Associate Professor of Finance, Department of Commerce, University of Queensland and Research Associate Professor of Finance, Fuqua School of Business, Duke University.
1994-1997	Assistant Professor of Finance, Fuqua School of Business, Duke University.
1990-1993	Research Assistant, Graduate School of Business, Stanford University.
1988-1990	Assistant Professor of Finance, Department of Commerce, University of Queensland.
1987	Specialist Tutor in Finance, Queensland University of Technology.
1986	Teaching Assistant in Finance, Department of Commerce, University of Queensland.

Academic Awards

2006 Outstanding Professor Award, Global Executive MBA, Fuqua School of Business, Duke University.
2002 Journal of Financial Economics, All-Star Paper Award, for Modeling the Conditional Distribution of Interest Rates as a Regime-Switching Process, JFE, 1996, 42, 27-62.
2002 Australian University Teaching Award – Business (a national award for all university instructors in all disciplines).
2000 University of Queensland Award for Excellence in Teaching (a University-wide award).
1999 Outstanding Professor Award, Global Executive MBA, Fuqua School of Business, Duke University.
1999 KPMG Teaching Prize, Department of Commerce, University of Queensland.
1998 Faculty Teaching Prize (Business, Economics, and Law), University of Queensland.
1991 Jaedicke Fellow in Finance, Doctoral Program, Graduate School of Business, Stanford University.
1989 Touche Ross Teaching Prize, Department of Commerce, University of Queensland.
1986 University Medal in Commerce, University of Queensland.

Large Grants (over $100, 000)

- Australian Research Council Linkage Grant, 2008—2010, Managing Asymmetry Risk ($320,000), with T. Brailsford, J.Alcock, and Tactical Global Management.
- Intelligent Grid Cluster, Distributed Energy – CSIRO Energy Transformed Flagship Collaboration Cluster Grant, 2008-2010 ($552,000)
- Australian Research Council Research Infrastructure Block Grant, 2007—2008, Australian Financial Information Database ($279,754).
- Australian Research Council Discovery Grant, 2006—2008, Capital Management in a Stochastic Earnings Environment ($270,000).
- Australian Research Council Discovery Grant, 2005—2007, Australian Cost of Equity.
- Australian Research Council Discovery Grant, 2002—2004, Quantification Issues in Corporate Valuation, the Cost of Capital, and Optimal Capital Structure.

- Australian Research Council Strategic Partnership Grant, 1997—2000, Electricity Contracts and Securities in a Deregulated Market: Valuation and Risk Management for Market Participants.

Current Research Interests

Benchmark returns and the cost of capital. Corporate Finance. Capital structure. Real and strategic options and corporate valuation. Financial and credit risk management. Empirical finance and asset pricing.

Publications

Gray, S. and J. Hall, (2012), "Unconstrained estimates of the equity risk premium" *Review of Accounting Studies,* forthcoming.

Gray, S. and J. Nowland, (2012), "Is prior director experience valuable?" *Accounting and Finance,* forthcoming.

Chan, K-F., R. Brooks, S. Treepongkaruna and S. Gray, (2012), "Do Trading Hours Affect Volatility Links in the Foreign Exchange Market?" *Australian Journal of Management*, forthcoming.

Chen, E. T., S. Gray and J. Nowland, (2012), "Multiple founders and firm value" *Pacific Basin Finance Journal*, 20, 3, 398-415.

Chan, K-F., R. Brooks, S. Treepongkaruna and S. Gray, (2011), "Asset market linkages: Evidence from financial, commodity and real estate assets," *Journal of Banking and Finance*, 35, 6, 1415-1426.

Parmenter, B, A. Breckenridge, and S. Gray, (2010), 'Economic Analysis of the Government's Recent Mining Tax Proposals', *Economic Papers*: *A Journal of Economics and Policy*, 29(3), September, 279-91.

Gray, S., C. Gaunt and Y. Wu, (2010), "A comparison of alternative bankruptcy prediction models," *Journal of Contemporary Accounting and Economics*, 6, 1, 34-45.

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.

Treepongkaruna, S. and S. Gray, (2009), "Information volatility links in the foreign exchange market," *Accounting and Finance*, 49, 2, 385-405.

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.

Gray, S. and S. Treepongkaruna, (2006), "Are there non-linearities in short-term interest rates?" *Accounting and Finance*, 46(1), 149-167.

Gray, P., S. Gray and T. Roche, (2005), "A Note on the Efficiency in Football Betting Markets: The Economic Significance of Trading Strategies," *Accounting and Finance*, 45(2) 269-281.

Duffie, D., S. Gray and P. Hoang, (2004), "Volatility in Energy Prices. In V. Kaminski," (Ed.), *Managing Energy Price Risk: The New Challenges and Solutions* (3rd ed.). London: Risk Books.

Cannavan, D., F. Finn and S. Gray, (2004), "The Value of Dividend Imputation Tax Credits in Australia," *Journal of Financial Economics*, 73, 167-197.

Gray, S. and S. Treepongkaruna, (2003), "Valuing Interest Rate Derivatives Using a Monte-Carlo Approach," *Accounting and Finance*, 43(2), 231-259.

Gray, S., T. Smith and R. Whaley, (2003), "Stock Splits: Implications for Investor Trading Costs," *Journal of Empirical Finance*, 10, 271-303.

Gray, S. and S. Treepongkaruna, (2003), "On the Robustness of Short-term Interest Rate Models," *Accounting and Finance*, 43(1), 87-121.

Gray, S. and S. Treepongkaruna, (2002), "How to Value Interest Rate Derivatives in a No-Arbitrage Setting," *Accounting Research Journal* (15), 1.

Gray, P. and S. Gray, (2001), "A Framework for Valuing Derivative Securities," *Financial Markets Institutions & Instruments*, 10(5), 253-276.

Gray, P. and S. Gray, (2001), "Option Pricing: A Synthesis of Alternate Approaches," *Accounting Research Journal*, 14(1), 75-83.

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.

Duffie, D., S. Gray and P. Hoang, (1999), "Volatility in Energy Prices. In R. Jameson," (Ed.), *Managing Energy Price Risk* (2nd ed.). London: Risk Publications.

Gray, S. and R. Whaley, (1999), "Reset Put Options: Valuation, Risk Characteristics, and an Example," *Australian Journal of Management*, 24(1), 1-21.

Bekaert, G. and S. Gray, (1998), "Target Zones and Exchange Rates: An Empirical Investigation," *Journal of International Economics*, 45(1), 1-35.

Gray, S. and R. Whaley, (1997), "Valuing S&P 500 Bear Market Warrants with a Periodic Reset," *Journal of Derivatives*, 5(1), 99-106.

Gray, S. and P. Gray, (1997), "Testing Market Efficiency: Evidence from the NFL Sports Betting Market," *The Journal of Finance*, 52(4), 1725-1737.

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.

Brailsford, T., S. Easton, P.Gray and S. Gray, (1995), "The Efficiency of Australian Football Betting Markets," *Australian Journal of Management*, 20(2), 167-196.

Duffie, D. and S. Gray, (1995), "Volatility in Energy Prices," In R. Jameson (Ed.), *Managing Energy Price Risk,* London: Risk Publications.

Gray, S. and A. Lynch, (1990), "An Alternative Explanation of the January Anomaly," *Accounting Research Journal*, 3(1), 19-27.

Gray, S. (1989), "Put Call Parity: An Extension of Boundary Conditions," *Australian Journal of Management*, 14(2), 151-170.

Gray, S. (1988), "The Straddle and the Efficiency of the Australian Exchange Traded Options Market," *Accounting Research Journal*, 1(2), 15-27.

Teaching

Fuqua School of Business, Duke University, Student Evaluations (0-7 scale):

- Financial Management (MBA Core): Average 6.5 over 7 years.
- Advanced Derivatives: Average 6.6 over 4 years.
- Empirical Issues in Asset Pricing: Ph.D. Class

1999, 2006 Outstanding Professor Award, Global Executive MBA, Fuqua School of Business, Duke University.

UQ Business School, University of Queensland, Student Evaluations (0-7 scale):

- Finance (MBA Core): Average 6.6 over 10 years.
- Corporate Finance Honours: Average 6.9 over 10 years.

2002 Australian University Teaching Award – Business (a national award for all university instructors in all disciplines).
2000 University of Queensland Award for Excellence in Teaching.
1999 Department of Commerce KPMG Teaching Prize, University of Queensland.
1998 Faculty Teaching Prize, Faculty of Business Economics and Law, University of Queensland.
1998 Commendation for Excellence in Teaching, University-wide Teaching Awards, University of Queensland.
1989 Touche Ross Teaching Prize, Department of Commerce, University of Queensland.

Board Positions

2002 - Present: Director, Financial Management Association of Australia Ltd.
2003 - Present: Director, Moreton Bay Boys College Ltd. (Chairman since 2007).
2002 - 2007: External Risk Advisor to Board of Enertrade (Queensland Power Trading Corporation Ltd.)

Consulting

Managing Director, Strategic Finance Group: www.sfgconsulting.com.au.

Consulting interests and specialties, with recent examples, include:

- **Corporate finance**
  - ⇒ **Listed multi-business corporation:** Detailed financial modeling of each business unit, analysis of corporate strategy, estimation of effects of alternate strategies, development of capital allocation framework.

- **Capital management and optimal capital structure**
  - ⇒ **State-owned electricity generator:** Built detailed financial model to analyze effects of increased leverage on cost of capital, entity value, credit rating, and stability of dividends. Debt of $500 million issued.

- **Cost of capital**
  - ⇒ **Cost of Capital in the Public Sector:** Provided advice to a government enterprise on how to estimate an appropriate cost of capital and benchmark return for Government-owned enterprises. Appearance as **expert witness** in legal proceedings that followed a regulatory determination.
  - ⇒ **Expert Witness:** Produced a written report and provided court testimony on issues relating to the cost of capital of a cable TV business.
  - ⇒ **Regulatory Cost of Capital:** Extensive work for regulators and regulated entities on all matters relating to estimation of weighted-average cost of capital.

- **Valuation**
  - ⇒ **Expert Witness:** Produced a written report and provided court testimony. The issue was whether, during a takeover offer, the shares of the bidding firm were affected by a liquidity premium due to its incorporation in the major stock market index.
  - ⇒ **Expert Witness:** Produced a written report and provided court testimony in relation to valuation issues involving an integrated mine and refinery.

- **Capital Raising**
  - ⇒ Produced comprehensive valuation models in the context of capital raisings for a range of businesses in a range of industries including manufacturing, film production, and biotechnology.

- **Asset pricing and empirical finance**

⇒ **Expert Witness:** Produced a written report on whether the client's arbitrage-driven trading strategy caused undue movements in the prices of certain shares.

- **Application of econometric techniques to applied problems in finance**
  - ⇒ **Debt Structure Review:** Provided advice to a large City Council on restructuring their debt portfolio. The issues involved optimisation of a range of performance measures for each business unit in the Council while simultaneously minimizing the volatility of the Council's equity in each business unit.
  - ⇒ **Superannuation Fund Performance Benchmarking:** Conducted an analysis of the techniques used by a large superannuation fund to benchmark its performance against competing funds.

- **Valuation of derivative securities**
  - ⇒ **Stochastic Volatility Models in Interest Rate Futures Markets:** Estimated and implemented a number of models designed to predict volatility in interest rate futures markets.

- **Application of option-pricing techniques to real project evaluation**
  - ⇒ **Real Option Valuation:** Developed a framework for valuing an option on a large office building. Acted as arbitrator between the various parties involved and reached a consensus valuation.
  - ⇒ **Real Option Valuation:** Used real options framework in the valuation of a bio-tech company in the context of an M&A transaction.

Appendix 3: Instructions from Johnson, Winter and Slattery

Partner: Roxanne Smith +61 8239 7108
Email: roxanne.smith@jws.com.au
Senior Associate: Christopher Beames +61 8239 7143
Email: christopher.beames@jws.com.au
Our Ref: A8059
Your Ref:
Doc ID: 62590283.1

18 October 2012

Professor Stephen Gray
SFG Consulting
PO Box 29
South Bank
Qld 4101

Dear Sir

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

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

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

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

Terms of Reference

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

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

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

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

The Gas Businesses are seeking expert assistance in respect of their submissions to the AER on the cost of equity in response to the Draft Decisions for each of them published in September 2012. In this context the Gas Businesses wish to engage you to prepare an expert report which:

1 Addresses the implications of the AER's estimated cost of equity in the Draft Decisions and whether the estimate can reasonably be considered to be commensurate with prevailing conditions in the market funds.

2 Responds to the AER's Draft Decision on MRP for the Gas Businesses in particular:

(a) The AER's reliance on historical excess returns in the range of 4.9 to 6.1% based on an arithmetic average and 3.0 to 4.7% based on geometric averages, and the AER's view that the best estimate of a 10 year forward looking MRP based on historical excess returns is somewhere between the geometric and arithmetic average (see page 105 of SP AusNet Draft Decision, Attachment 4 and appendix B.2.1). Note the view expressed by *Lally (The Cost of Equity and the Market Risk Premium* , 25 July 2012) that arithmetic rather than geometric averages should be used.

(b) The AER's analysis of SFG's methodology in its report for the Gas Businesses using certain financial market indicators (implied volatility, credit spreads, dividend yields) (see appendix B.2.4 and B.2.6 of the Draft Decisions), including updated data in respect of those financial market indicators.

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

(d) The AER's reliance on survey evidence and McKenzie and Partington's report *Supplementary report on the MRP*, February 2012, in this regard, to the extent not already covered in your report of March 2012 for the Victorian Gas Distributors.

(e) The AER's comments with respect to the economic interdependencies between the MRP and risk free rate[2]

(f) Any other relevant matters you which to comment on arising from the AER's MRP decision and relevant expert reports, including: *Lally* (*Cost of Equity and the MRP)*(July 2012) and *McKenzie and Partington (Supplementary Report on the MRP*, April 2012*)*, limited specifically to issues effecting the

1 See page 113 of Attachment 4 to SP AusNet Draft Decision.
2 Pages 114 to 116 of the SP AusNet Draft Decision.

MRP. In particular, comment on Lally's opinions expressed that the AER should give consideration or additional weight to a number of methods in addition to historical excess returns and survey results, including the Siegal approach, DGM and results from a range of other markets.

3 Responds to the AER's reasonableness checks on the overall rate of return in the section B.3 of the Appendices to the Gas Businesses Draft Decisions.

Use of Report

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

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

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

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

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

Timeframe

The AER's Draft Decisions in respect of the Gas Businesses' respective access arrangement revision proposals have now been released. The Gas Businesses will then have until 9 November 2012 to respond to the Draft Decisions (including the provision of any expert reports). We request that you provide your report to us or to each of the Gas Businesses by the end of October 2012 so that the Gas Businesses may finalise their submissions in advance of the due date.

Compliance with the Code of Conduct for Expert Witnesses

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

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

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

Your report must also:

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

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

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

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

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

6 otherwise comply with the Expert Witness Guidelines.

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

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

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

Terms of Engagement

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

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

Yours faithfully

Johnson Winter & Slattery

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

……
Signed and acknowledged by Professor Stephen Gray

Date ……..