

Response to the QCA Discussion Paper on risk-free rate and market risk premium

Report for Aurizon Ltd

19 March 2013

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1. Background and conclusions

Overview and instructions

1. SFG Consulting (**SFG**) has been retained by Aurizon Ltd (**Aurizon**) to provide our views on the discussion paper *The risk-free rate and the market risk premium*, published by the Queensland Competition Authority (**QCA**) in late November 2012. Throughout this report, we refer to this discussion paper as the **MRP Discussion Paper**.
2. The QCA is currently undertaking a comprehensive review of its cost of capital methodology for regulated businesses. It plans to release a series of discussion papers covering various aspects of the cost of capital for public comment. The QCA will then prepare position papers on the key parameters in the cost of capital.
3. The MRP Discussion Paper sets out the QCA's current approach to estimating the risk-free rate and the market risk premium. In particular, the QCA estimates the risk-free rate as the yield on five-year Commonwealth government bonds, and it has adopted a market risk premium (**MRP**) estimate of 6% in every decision it has issued since its inception.
4. The MRP Discussion Paper also notes that:
 - a) Government bond yields have been at or near their historical lows since the onset of the global financial crisis (**GFC**); and
 - b) The QCA's current approach for estimating MRP would again produce an estimate of 6% in the current market conditions.

Summary of conclusions

The QCA's current approach

5. The QCA currently sets MRP as the average of the estimates from four different approaches:
 - a) Ibbotson historical excess returns;
 - b) Siegel adjusted historical excess returns;
 - c) Cornell dividend growth model; and
 - d) Survey responses.
6. Only the Cornell method is based on current market data. Under this approach, the QCA would only move from its 6% estimate for MRP in circumstances where current market data indicated an MRP in excess of 10%. Even in such circumstances, the median of the four estimates is highly likely to remain within the QCA's 6% rounding range. Consequently, it seems highly unlikely that in any market circumstances the current QCA approach would ever produce an estimate other than 6%.
7. In every one of its determinations to date, the QCA has adopted an MRP estimate of 6%. Even at the height of the GFC when other regulators (e.g., Australian Energy Regulator) had increased their estimates of MRP, the QCA still adopted an estimate of 6% based on its current approach.
8. Consequently, the QCA approach to estimating the required return on equity can be summarised as:

- a) Using the Sharpe-Lintner CAPM, with
 - b) The risk-free rate estimated as the contemporaneous yield on five-year Commonwealth Government bonds; and
 - c) MRP fixed at 6%.
9. The outcome of the current QCA approach is estimates that suggest that the required return on equity has, since the onset of the GFC, been lower than at any time in recorded history.

[Implications of the current QCA practice for determining the allowed return on equity](#)

10. The current practice of the QCA is to determine the allowed return on equity by adding a constant premium of 6%, scaled up or down according to the estimated equity beta, to the contemporaneous estimate of the risk-free rate of interest. This approach has the following implications:
- a) Since the onset of the GFC, the estimate of the required return on equity has been lower than at any time on record. This implies that, since the onset of the GFC, equity investors have been 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, 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 require lower returns on residual equity in the firm than they would require on first-ranking investment grade debt in the same firm; and
 - d) The firm could materially lower its cost of capital by employing 100% equity finance.

[Ibbotson historical mean excess](#)

11. 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.
12. 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.¹ 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.

¹AER (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."

13. 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.

Siegel adjusted historical mean excess

14. The Siegel approach is based on the hypothesis that, in the historical sample period prior to 1990, inflation turned out to be higher than expected, and that this caused real returns on government bonds to be lower than they would otherwise have been. The Siegel approach is also based on the further hypothesis that the low real yields on government bonds that were observed in the historical data will not be again observed in the future.
15. In effect, the Siegel approach results in an estimate of approximately 2% below the Ibbotson historical average estimate. Since the historical average and the Siegel approach are each given a 25% weighting in the final MRP estimate, the net effect is that 50% of the QCA's estimate of MRP is based on the historical average minus one per cent.²
16. In our view, there are a number of reasons why the use of (or at least the weight applied to) the Siegel approach should be revised:
 - a) The Siegel approach is based on the notion that real government bond yields will be higher in the future than they have been in the past. But there are many features of past stock returns that some would argue are likely to be different in the future. There are many "it'll be different this time" arguments that one could consider. In our view, it is generally better to use historical data as it is, rather than an estimate of what it would have been if a particular event or phenomena had not occurred;
 - b) Siegel's prediction in the early 1990's that future real risk-free rates would be materially higher in the future has turned out to be spectacularly wrong;
 - c) The QCA appears to still be using an estimate of 4% for the current forward-looking real risk free rate based on Lally (2004). That estimate was provided during the middle of one of the longest and largest stock market rallies of all time. Real rates since that time (at least as estimated using the yield on inflation-indexed government bonds) have never approached the predicted value of 4% and are currently approximately one quarter of that figure;
 - d) If the Siegel approach is to be used, current data should be used. The yield on inflation-indexed government bonds indicates that the current forward-looking real risk-free rate is approximately 1%. If this figure is used in place of the Lally estimate of 4% from 10 years ago, the Siegel adjustment would be to increase the historical average by approximately 1% (being the difference between the historical estimate of 2% and the current estimate of 1%). Such an approach would have the advantage of increasing the historical estimate during recessions and financial crises and decreasing it during expansions – in line with the actual movement in risk premiums; and
 - e) No other Australian regulators use the Siegel approach. Moreover, the respondents to the Fernandez (2011) survey (which the QCA proposes to use as the basis for its survey estimate

² That is, 25% weight applied to the historical average and 25% weight applied to the historical average less 2% is equivalent to 50% weight applied to the historical average less 1%.

of MRP) were also asked to identify books or articles that they use to support their estimate. On this question, less than half of one per cent indicated that their estimate was informed in some way by the Siegel approach.

The Cornell dividend growth approach

17. It is well accepted, including by the QCA,³ that dividend growth models (DGMs) currently indicate that required returns on equity are above their long-run average. The QCA has regard to the Cornell dividend growth model, however the way the QCA processes this information results in it maintaining its MRP estimate of 6%. Specifically, the QCA applies only a 25% weight to this contemporaneous estimate of MRP and then rounds the its final estimate to the nearest full percentage point. This approach has resulted in the QCA adopting a constant 6% MRP over time. The outcome of this approach is that the allowed return on equity since the onset of the GFC being lower than at any time on record.

The use of survey information

18. The Australian Competition Tribunal recently indicated⁴ 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.
19. None of these requirements are met by the survey on which the QCA has relied in the Discussion Paper:
 - a) It is not timely, in that respondents were surveyed in market conditions that were materially different from those at the time of the MRP Discussion Paper;
 - b) It is unclear, in that there is no information about what the respondents used the MRP estimate for, how they used it, or how its value might be related to other parameters such as the risk-free rate; and
 - c) It is unrepresentative, in that there were only 40 respondents to the question about the Australian MRP and no information about the non-response rate.
20. In our view, the best information about the prevailing conditions in the market for funds comes from traded prices drawn from the market for funds, rather than from survey responses. We note that this view is consistent with the recent directions from the Tribunal.

The direction of regulatory practice in Australia

21. 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

³QCA MRP Discussion Paper, Table 3.1, p. 11.

⁴Application by Envestra Ltd (No 2) [2012] ACompT 3.

relationship between the MRP and the risk free rate,”⁵ 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,”⁶ 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.”⁷

22. 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.⁸ 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%.
23. In its recent rule change process, the Australian Energy Markets Commission (**AEMC**) made a number of significant changes to the National Electricity Rules (**NER**) and National Gas Rules (**NGR**) to prevent the AER from continuing to adopt an approach that is similar to the QCA’s current approach. The key changes that the AEMC made were:
 - a) To introduce an “overall rate of return objective” to ensure that the focus is on the reasonableness of the allowed return on equity – eliminating the silo approach that focused separately on each individual parameter; and
 - b) Requiring the regulator to have regard to all relevant approaches and evidence – eliminating the focus on a single model (CAPM) that could be used without having regard to a weight of evidence suggesting that the way the regulator implemented that model produced an estimate of the required return on equity that was implausible in the circumstances.
24. The AEMC rule changes effectively rule out the mechanistic implementation of the CAPM as a method for estimating the required return on equity.
25. In the context of its cost of capital review, the QCA has an opportunity to follow the current direction of regulatory practice in Australia:
 - a) The **AEMC** has changed the NER and NGR to require energy network regulators to have regard to all relevant methods, models, data and evidence and to have a primary focus on achieving an estimate of the required return on equity that is reasonable in the circumstances. It has ruled out the previous mechanistic implementation of the CAPM using the current government bond rate and MRP=6%;
 - b) The **AER** and **ERA** are required to follow the path set out by the AEMC and are currently in the process of consulting with stakeholders and developing guidelines to explain their new approach. The new approach of the AER will undoubtedly have some influence on the practice of the **ACCC**;

⁵ IPART (2012), p. 107.

⁶ IPART (2012), p. 107.

⁷ IPART (2012), p. 107.

⁸ We discuss the relevant cases in Section 8 below.

- c) **IPART** has already departed from the mechanistic CAPM due to their conclusion that it does not produce sensible estimates of the required return on equity in the current market conditions. IPART is also conducting a review to determine how to best estimate the required return on equity going forward; and
 - d) In its most recent decision, the Independent Competition and Regulatory Commission (**ICRC**) has departed from the mechanistic CAPM and used a range of evidence to determine the allowed return on equity.⁹
26. In summary, Australian regulatory practice has already moved beyond the mechanistic implementation of the CAPM. The QCA has a present opportunity to move in the current direction of regulatory practice in Australia.
27. Whereas a WACC review in the context of the continued mechanistic implementation of the CAPM would be structured with independent work streams for individual parameters, the current approach of other regulators involves widespread consultation on issues about the range of methods, models, data and evidence that is relevant, and the process by which it should all be distilled into an allowed return on equity.

⁹ We would not advocate following the specific ICRC approach, but simply note here that the ICRC is another regulator that has already moved beyond the mechanistic CAPM.

2. The current approach of the QCA

Sharpe-Lintner CAPM

28. In every decision of the QCA to date, the estimate of the required return on equity has been based on the Sharpe-Lintner Capital Asset Pricing Model (**CAPM**).

QCA approach for estimating risk-free rate

29. The QCA currently estimates the risk-free rate as the contemporaneous yield on five-year Commonwealth government bonds – that is, the yield at (or close to) the beginning of the regulatory period.

QCA approach for estimating market risk premium

30. The QCA’s approach for estimating MRP is based on four estimates:
- a) **Ibbotson**: An historical average of market excess returns (annual observations of the difference between the return on a broad stock market index and the government bond yield);
 - b) **Siegel**: An historical average of market excess returns adjusted downwards by approximately 2%¹⁰ “based on the premise that (a) historically, unanticipated inflation artificially reduced the real return on bonds but not the real return on equities, and (b) such unanticipated inflation will not recur in future and real bond yields in the future will be higher than they were in the past;”
 - c) **Cornell**: A version of the dividend growth model (**DGM**) where the estimate of MRP is derived from dividend yields and expected dividend growth rates; and
 - d) **Surveys**: The self-reported views of those “academics, financial analysts and company managers” who respond to surveys.
31. The QCA then takes an equally-weighted average of the four estimates and rounds to the nearest whole per cent. This approach has led the QCA to adopt an MRP estimate of 6% in every one of its determinations to date. The MRP Discussion Paper also indicates that the current QCA approach would continue to produce a value of 6% in the current market conditions. Current QCA estimates are set out in Table 1 below, with the mean of 6.26% being rounded down to 6.00%

Table 1. Current QCA estimate of MRP

Method	Current estimate
Ibbotson	6.21%
Siegel	4.32%
Cornell	8.70%
Surveys	5.80%
Mean	6.26%
Median	6.00%

Source: MRP Discussion Paper, p. 11.

¹⁰ That is, an estimate of 6% would be adjusted downwards to an estimate of 4%.

32. The Ibbotson figure is an estimate of the risk premium that investors have actually received, on average, from the Australian market. Because it is a long-term historical average, it is an estimate of the MRP that investors should expect during average market conditions. Because it is a backward-looking long-term average, it will be very slow to move – every additional year that passes provides only one additional data point. Moreover, any variation in this estimate will be in the wrong direction – during financial crises when financial risk premiums are at their highest, stock prices tend to fall materially, causing a small reduction in the historical average.
33. The Siegel figure is an estimate of the risk premium that investors would have received, on average, from the Australian market, but for the assumed effect of unanticipated inflation on bonds but not stocks. Because it is also a long-term historical average, it too is an estimate of the MRP that investors should expect during average market conditions, if the assumed past effects of unanticipated inflation do not apply in the future. It implies that, in average market conditions, investors should have a forward-looking expectation that the risk premium will be approximately 2% less than what it has been historically. Because it is a long-term average, it too will be very slow to move.
34. The Cornell method uses current market data only. It is an estimate of the market risk premium that equates the present value of expected future dividends with current market prices. Relative to the two previous methods, the Cornell method has the advantage of being forward-looking, but the disadvantage of requiring estimates of another parameter (expected dividend growth). It also has the advantage of increasing (rather than decreasing) during financial crises when risk premiums are undoubtedly at elevated levels.
35. The survey figure is difficult to interpret as it depends on how many surveys are examined, the sample size and response rate, the identity and qualifications of respondents, the particular question asked, and so on. Nevertheless, the survey values the QCA has relied upon have always been very close to 6%. For example, in its 2010 QR Network Decision the QCA used a survey value of exactly 6% and in the MRP Discussion Paper it proposes a value of 5.8%. The survey estimate must remain fixed at least until the publication of a new survey that the QCA considers to be more reliable than the one (or more) that it currently uses. This means that the survey estimate is also likely to be very slow-moving.
36. In summary, the QCA places 25% weight on the historical average, 25% weight on two-thirds of the historical average, 25% weight on the forward-looking Cornell method and 25% weight on survey responses. The historical and survey estimates collectively receive 75% weight and are likely to be very slow-moving over time. The average QCA estimate from these three approaches in the MRP Discussion Paper is 5.4% and the QCA assigns 75% weight to this value. Consequently, the forward-looking Cornell estimate would need to be higher than 10% for the QCA's mean estimate to exceed 6.5% and not be rounded back down to 6.0%.¹¹
37. Moreover, to the extent that the QCA places weight on the median estimate, the current 6% estimate will be even more entrenched. For example, in periods of financial crisis when risk premiums are elevated it will inevitably be the case that the Cornell method (being the only one that is based on current market data) will produce the highest estimate of the MRP and that the Siegel method (which adjusts the historical data downwards) will be the lowest. In this case, the median will, by definition, be the mean of the Ibbotson and survey approaches with the Cornell approach effectively receiving no weight at all. In summary, the requirement that the final estimate is rounded to the nearest full percentage point effectively changes the weights applied to the four individual estimates in such a way that the only contemporaneous estimate is given zero weight.

¹¹ That is, $0.75 \times 5.4\% + 0.25 \times 10.0\% = 6.6\%$.

38. In summary:

- a) Under its current approach, the QCA would only move from its 6% estimate for MRP in circumstances where market data indicated an MRP in excess of 10%. Even in such circumstances, the median is highly likely to remain in the QCA's 6% rounding range. Consequently, it seems highly unlikely that in any market circumstances the current QCA approach would ever produce an estimate other than 6%; and
- b) In every one of its determinations to date, the QCA has adopted an MRP estimate of 6%. Even at the height of the GFC when other regulators had increased their estimates of MRP, the QCA still adopted an estimate of 6% based on its current approach.

39. Consequently, the QCA approach to estimating the required return on equity can be summarised as:

- a) Using the Sharpe-Lintner CAPM, with
- b) The risk-free rate estimated as the contemporaneous yield on five-year Commonwealth Government bonds; and
- c) MRP fixed at 6%.

3. Implications of the current QCA approach

Overview

40. In this section, we set out the relevant requirements of the Queensland Competition Authority Act 1997 and evaluate the outcomes of the current approach for determining the allowed return on equity with the requirements under the Act.

Requirements of QCA Act

41. The Queensland Competition Authority Act 1997 states that in relation to access arrangements, the objective is to:

promote the economically efficient operation of, use of and investment in, significant infrastructure by which services are provided, with the effect of promoting effective competition in upstream and downstream markets.¹²

and that:

The pricing principles in relation to the price of access to a service are that the price should generate expected revenue for the service that is at least enough to meet the efficient costs of providing access to the service and include a return on investment commensurate with the regulatory and commercial risks involved.¹³

42. In this report, we focus on the allowed return on equity and we summarise the requirements of the QCA Act in testing whether the allowed return is commensurate with the prevailing conditions in the market. If the allowed return is materially less than that which is commensurate with the prevailing conditions in the market, it would not promote the economically efficient investment in infrastructure – as capital would not be provided if the returns on offer were below what is required by investors given the prevailing conditions in the market. Moreover, if the allowed return is materially less than that which is commensurate with the prevailing conditions in the market, it cannot be said to be at least enough to provide a return on investment that is commensurate with the commercial risks involved.

The QCA's current approach

Required return on equity

43. As set out above, the current QCA approach to estimating the required return on equity can be summarised as:
- a) Using the Sharpe Lintner CAPM, with
 - b) The risk-free rate estimated as the contemporaneous yield on five-year Commonwealth Government bonds; and
 - c) MRP fixed at 6%.

¹² QCA Act, s.69E.

¹³ QCA Act, s.168A.

44. Many regulated infrastructure businesses are assigned an equity beta of 0.8 by their regulators,¹⁴ so we use that value for the sake of our examples and illustrations below.
45. These parameter estimates currently combine to produce an allowed return on equity of 7.46% p.a.:

$$\begin{aligned} r_e &= r_f + \beta_e \times MRP \\ &= 2.66\% + 0.8 \times 6\% = 7.46\%. \end{aligned}$$

Required return on debt

46. One useful point of comparison is between the QCA's allowed return on equity and its allowed return on debt in the same firm. The current QCA approach¹⁵ is to set the allowed return on debt as the sum of:
- An estimate of the yield to maturity of 10-year BBB+ corporate bonds;¹⁶
 - An allowance for the use of interest rate swaps; and
 - An allowance for debt refinancing costs.
47. The QCA determined the allowed return on debt on the basis of the firm raising 10-year BBB+ debt finance from investors, and then converting that 10-year debt into 5-year debt using a combination of interest rate swaps and credit default swaps. The QCA noted that the regulated business is not *required* to raise and manage its debt finance in this manner, but rather this was the QCA's estimate of an efficient means of raising and managing debt.
48. In the analysis that follows, we make a number of comparisons between the returns that would be available to debt and equity investors in the regulated firm. In this regard, we note that debt investors would receive the yield to maturity, but not the allowance for interest rate swaps or debt refinancing costs. Consequently, our focus is on the yield to maturity of 10-year BBB+ corporate bonds.
49. We note that the Australian Energy Regulator (**AER**) has recently estimated the yield to maturity of 10-year BBB+ corporate bonds to be 6.74%. For the purposes of our comparative analysis, we take this as an estimate of the current return to be paid to debt investors in the regulated firm.

The current QCA approach implies that equity capital is now cheaper than ever before

50. 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 current QCA approach. In particular:
- The risk-free rate has been set to the yield on 5-year Commonwealth Government securities;

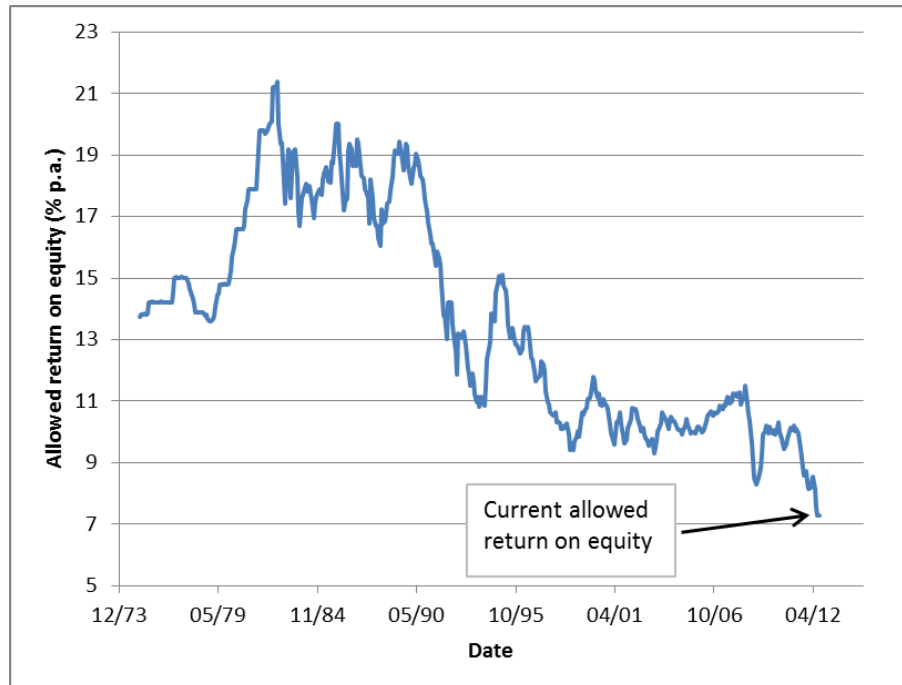
¹⁴ For example, the AER uses an equity beta estimate of 0.8 for gas pipelines, electricity transmission networks and gas and electricity distribution networks, the ERA uses an estimate of 0.8 for gas and electricity assets in Western Australia, and the QCA used an estimate of 0.8 in its last QR Network decision.

¹⁵ See the QCA's 2010 QR Network Decision. We note that these values are consistent with the equity beta of 0.8 for the purposes of our comparisons (i.e., The QCA adopted an equity beta of 0.8 and a BBB+ credit rating in that decision).

¹⁶ The QCA disaggregated this into three components – the yield on 5-year government bonds, the difference between the yields on 5-year corporate and government bonds, and the difference between the yields on 10-year and 5-year corporate bonds. The sum of the three components is the yield on 10-year corporate bonds.

- b) The market risk premium has been fixed at 6%; and
- c) Equity beta has been fixed at 0.8.

Figure 1. Allowed return on equity under the current QCA approach



Source: Reserve Bank of Australia.

Estimates of the return on equity are computed as the return that the QCA would have adopted if it had applied its approach and current parameter estimates to the government bond market data at the time.

51. Figure 1 above implies that equity capital is currently cheaper than at any time since 1975 – that investors are more prepared to make equity investments requiring lower returns than ever before. That is, the current estimate obtained by applying the current QCA approach could only be said to be commensurate with the prevailing conditions in the market for funds if those prevailing conditions were such that equity capital really was now cheaper than at any time since records have been kept.

Is equity capital really cheaper than ever before?

52. The application of the current QCA approach 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.
53. 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.¹⁷

¹⁷Zenner and Junac (2012), p. 3.

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

The 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.¹⁸

55. 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.
56. 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.
57. 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 the inevitable conclusion from the current QCA approach.
58. 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. That is, the current QCA approach may have produced estimates of the required return on equity that were plausible in other market conditions, but the outputs are implausible in the current market conditions (as explained further below). Moreover, we also show below that Australian regulatory practice is moving away from the current QCA approach. This provides the QCA with an ideal opportunity to revise its approach for estimating the required return on equity to an approach that is consistent with Australian regulatory developments, and which provides reasonable estimates in a range of market conditions.

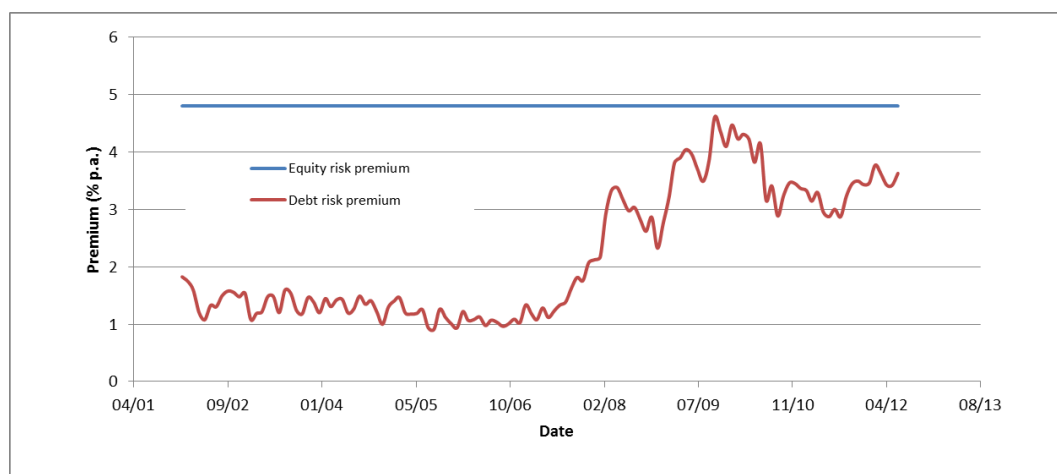
Under the current approach, regulatory estimates of debt and equity risk premiums are inconsistent

59. Figure 2 below shows:
- a) The allowed regulatory equity risk premium (computed as set out in Paragraph 50 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).¹⁹

¹⁸Zenner and Junac (2012), p. 3.

¹⁹ 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 QCA approach and parameter estimates



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

Estimates are computed as the risk premiums that the QCA would have adopted if it had applied its approach to the relevant market data at the time.

60. Figure 2 shows that the debt risk premium has increased materially since 2008. 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.
61. By contrast, the QCA's estimates of the premium that investors in the benchmark firm would require for bearing equity risk has not increased at all over the same period.
62. It is unlikely that there could be any circumstances whereby debt investors would be requiring materially higher risk premiums, but equity investors would not. 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 not 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, Damodaran [sic] (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.²⁰

63. 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.”
64. 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

²⁰ McKenzie and Partington (2011), Paragraph 106.

market for funds. 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.

65. To put this into perspective, and consistent with Figure 2 above, prior to the GFC the regulatory premium for taking on equity risk (assuming an equity beta of 0.8) was approximately 400 basis points higher than the regulatory premium for debt risk. The QCA approach would currently imply that the premium for taking on equity risk is now approximately 100 basis points.²¹ In our view, the suggestion that the premium for equity risk has fallen to this extent is implausible.

The return on equity is below the return on debt for some investors²²

Return net of imputation credits

66. Under the QCA'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.

67. It then follows that the proportion of the return from sources other than imputation credits (i.e., from dividends and capital gains) is:²³

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

68. Using the values for γ and T from the QCA's 2010 QRN Decision, for example, the return to equity holders from dividends and capital gains is:

$$r_e \left[\frac{1 - T}{1 - T(1 - \gamma)} \right] = 7.46\% \left[\frac{1 - 0.3}{1 - 0.3(1 - 0.5)} \right] = 6.14\%.$$

Return available to non-resident investors

69. 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 6.14% from the benchmark firm. By contrast those same investors can receive a fixed rate of return of 6.74% from investment grade debt in the same benchmark firm.

²¹ 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%.

²² This section introduces other WACC parameters into the comparison. Later in this report we submit that all parameters should be considered holistically with a focus on the final outcome, rather than a siloed independent focus on individual parameters. This section is an example of why a holistic approach, rather than a siloed approach should be adopted.

²³ This adjustment factor is derived in Officer (1994) and is common across the Australian regulatory framework. For example, 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.

70. 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. At this stage, we note that:

- a) The QCA assumes that the regulated firm has a strong investment grade credit rating; and
- b) Although debt holders have provided only 55% 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.

71. 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.

72. However, under the QCA's current approach, non-resident investors would be allowed a (risky) expected return of 6.14% on their equity investment. That is, the QCA's 2010 approach implies that a material number of investors will invest in residual equity in the benchmark firm for a lower return than they could receive on first-ranking investment grade debt in the same firm. In our view, this is neither reasonable nor plausible.

The current QCA approach produces estimates that are inconsistent with assumed capital structure

73. By way of example, the QCA adopted an asset beta estimate of 0.45 in its 2010 Rail Decision. This represents the QCA's estimate of the systematic risk facing equity holders if the firm was financed entirely by equity. The QCA's estimate then implies that, if the firm was financed entirely by equity, shareholders would currently require a total return of:

$$\begin{aligned} r_e &= r_f + \beta_e \times MRP \\ &= 2.66\% + 0.45 \times 6\% = 5.36\%. \end{aligned}$$

74. This also represents an estimate of the WACC, as it would be if the firm was currently financed entirely by equity. But this estimate of WACC is materially below the QCA's estimate of WACC based on the QCA's assumed efficient financing structure. That is, according to the QCA's estimates, the regulated firm's cost of capital could be materially reduced if it employed 100% equity financing.

75. That is, the current QCA approach suggests that the regulated firm could materially reduce its cost of capital by removing all debt financing. This is another feature to support the notion that the current approach should be revised.

4. Ibbotson historical mean excess returns

76. 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. 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. 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.
77. 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) have recently advised the AER 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.²⁴

78. 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 also 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.²⁵

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).²⁶

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

As noted by Professor Davis, the AER is using an ‘implicit conditional CAPM’ approach.²⁷

80. Within this framework, there is a long-run unconditional mean estimate of MRP 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.
81. The fact that the AER increased its estimate of MRP to 6.5% in its last (2009) 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

²⁴ McKenzie and Partington (2011), Paragraph 5.

²⁵ Davis (2011, p. 9).

²⁶ Davis (2011, p. 11).

²⁷ Envestra Queensland Gas Network, Final Decision, June 2011, Appendix B, p. 41.

prevailing conditions in the market for funds changes over time as the conditions in the market change.

82. In its MRP Discussion Paper, the QCA notes that the MRP is “forward-looking”²⁸ and may vary over time so that it would be conceptually incorrect to ex-ante fix the estimate of MRP at a constant 6%.²⁹
83. 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. The best illustration of this point comes from the AER’s last WACC Review. During 2008 and early 2009, global stock markets plummeted. Adding the large negative returns from this period to the existing sample of historical excess returns causes the mean to fall. But in such market conditions, risk premiums are likely to be higher, not lower. Indeed, other things equal, an increase in risk premiums must cause a fall in stock prices, and consequently a fall in the historical mean of excess returns. The AER recognised this point in its WACC Review and increased its estimate of MRP even though the mean of historical excess returns had fallen.
84. The QCA also noted this point in its 2010 Decision for QRN. In particular, the QCA noted that the dramatic falls in stock prices would have actually led to the historical average estimate of MRP being lower, at a time when risk premiums in financial markets were clearly not lower.³⁰
85. 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.

²⁸ QCA MRP Discussion Paper, p. 9.

²⁹ QCA MRP Discussion Paper, p. 16.

³⁰ QRN 2010 Draft Decision, p. 41.

5. Siegel adjustment to historical average

Implementation and effect of Siegel approach

86. In its MRP Discussion Paper, the QCA explains that the Siegel approach is based on the hypothesis that, in the historical sample period prior to 1990, inflation turned out to be higher than expected, and that this caused real returns on government bonds to be lower than they would otherwise have been. The Siegel approach is also based on the further hypothesis that the low real yields on government bonds that were observed in the historical data will not be again observed in the future. In particular, the QCA parameterises the Siegel approach as:

$$MRP_S = MRP_I + (\bar{r}_r - r_r^e)$$

where \bar{r}_r is the long-run historical real risk-free rate and r_r^e is the expected future real risk-free rate.³¹ That is, the historical average MRP estimate is adjusted by the extent to which the future real risk-free rate is expected to be higher than the historical real risk-free rate.

87. The MRP Discussion Paper further explains that it uses an estimate of the future real risk-free rate of 4% p.a. from Lally (2004). The QCA's average historical estimate of the real risk-free rate is approximately 2% (depending on when the estimate was taken), so the Siegel approach essentially reduces the historical estimate of MRP by 2%. Since the historical average and the Siegel approach are each given a 50% weighting in the final MRP estimate, the net effect is that 50% of the QCA's estimate of MRP is based on the historical average minus one per cent.³²

Issues to consider with the Siegel approach

The "it'll be different this time" argument

88. The Siegel approach is based on the notion that real government bond yields will be higher in the future than they have been in the past. But there are many features of past stock returns that some would argue are likely to be different in the future. For example, some have argued that technological advances are likely to be slower in future than they have been in the past. Others have argued that financial crises are likely to be more frequent in the future due to spill-overs between integrated capital markets. There are many "it'll be different this time" arguments that one could consider. It is not clear why unexpected inflation is the only one that the QCA considers and why it receives so much weight in the MRP estimate. The whole reason for using a long-term historical average is that there are some surprises that cause stock prices to go up and others that cause stock prices to go down. Over a long period these surprises average out. Once the process of making ex-post adjustments to historical averages for events or phenomena that we don't think will occur again, it is difficult to know when to draw the line. In our view, it is generally better to use historical data as it is, rather than an estimate of what it would have been if a particular event or phenomena had not occurred.

It hasn't been different so far

89. Siegel's prediction in the early 1990's that future real risk-free rates would be materially higher in the future has turned out to be spectacularly wrong. By way of example, the Economic Regulation

³¹ QCA MRP Discussion Paper, p. 22, Equation 11.

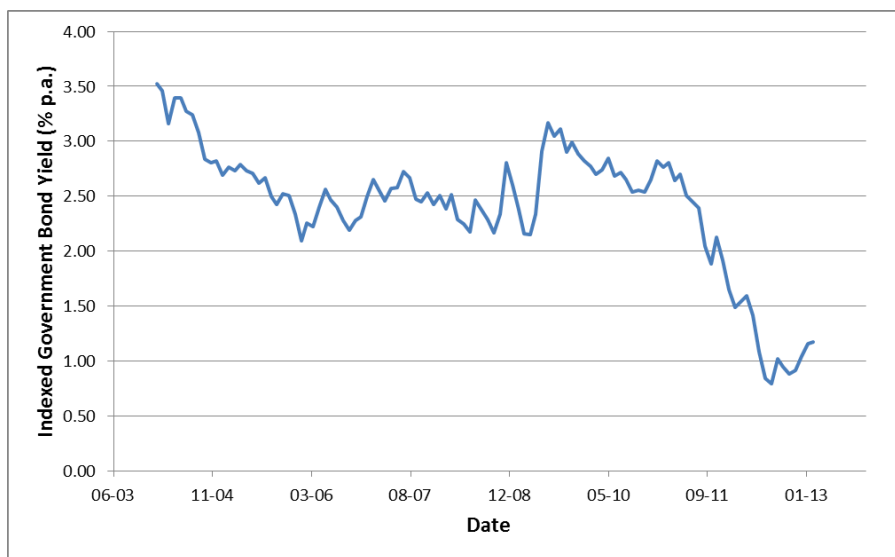
³² That is, 25% weight applied to the historical average and 25% weight applied to the historical average less 2% is equivalent to 50% weight applied to the historical average less 1%.

Authority of Western Australia (**ERA**) recently had to find a new way of estimating the real risk-free rate because its existing method produced a *negative* estimate. In its Western Power Final Decision, the ERA stated:

The Authority notes the real risk free rate derived by using Fisher’s equation is negative when the nominal risk free rate is estimated using linear extrapolation from 5-year CGS observed yields and the expected inflation rate is estimated using the geometric mean of the RBA’s inflation forecasts.³³

- 90. That is, the ERA’s approach of estimating the real risk-free rate from nominal government bonds and RBA inflation forecasts produced a negative estimate of the real risk-free rate. The ERA then turned to the yield on inflation indexed government bonds as an alternative estimate.
- 91. The QCA appears to still be using an estimate of 4% for the current forward-looking real risk free rate based on Lally (2004). That estimate was provided during the middle of one of the longest and largest stock market rallies of all time. Real rates since that time (at least as estimated using the yield on inflation-indexed government bonds) have never approached the predicted value of 4% and are currently approximately one quarter of that figure, as set out in Figure 3 below.

Figure 3. Real risk-free rates



Source: Reserve Bank of Australia.

Updated estimates should be used

- 92. If the Siegel approach is to be used, current data should be used. The yield on inflation-indexed government bonds indicates that the current forward-looking real risk-free rate is approximately 1%. If this figure is used in place of the Lally estimate of 4% from 10 years ago, the Siegel adjustment would be to increase the historical average by approximately 1% (being the difference between the historical estimate of 2% and the current estimate of 1%). Such an approach would have the advantage of increasing the historical estimate during recessions and financial crises and decreasing it during expansions – in line with the actual movement in risk premiums.

³³ ERA, Western Power Final Decision, Paragraph 1414.

No one else uses the Siegel approach

93. The final issue to be considered in relation to the Siegel approach is that no one else uses it. No other Australian regulators use the Siegel approach. Moreover, the respondents to the Fernandez (2011) survey (which the QCA proposes to use as the basis for its survey estimate of MRP) were also asked to identify books or articles that they use to support their estimate. On this question, less than half of one per cent indicated that their estimate was informed in some way by the Siegel approach.

6. Dividend growth models

QCA approach

94. In its 2010 Draft Decision for QRN,³⁴ the QCA examined two versions of the dividend growth model – the Cornell method and the discounted dividends model. The QCA provided more detail on these two models in the 2009 Draft Decision for QRN:

Cornell method – forward-looking approach where short term forecasts of the growth rate in earnings per share converge upon the forecast long-run GDP growth rate over time;

discounted dividends model – forward-looking approach where expected growth rates in earnings per share for all future years are assumed to be equal and convergence is immediate.³⁵

95. In its 2010 Draft Decision, the QCA referenced its 2009 Draft Decision and used the same estimates of MRP from the Cornell method and the discounted dividends model. The QCA's practice had been to place more weight on the Cornell method and in its MRP Discussion Paper it refers exclusively to the Cornell method.

Recent estimates

96. In its recent Draft Decisions for Victorian Gas Businesses, the AER reviewed a range of dividend growth model estimates and concluded that:

The AER notes DGM analysis is producing high positive MRP estimates.³⁶

97. A number of commercial market practitioners have also reached the conclusion that DGM-type methods are currently pointing toward materially higher than average required returns on equity. As noted above, Zenner and Junac (2012) conclude that:

the equity risk premia, however estimated, have rarely been this high.³⁷

and that:

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.³⁸

98. Nelson, Ferrarone and McGuire (2012) use a multi-stage DGM (similar to the Cornell method) to estimate the implied market risk premium. Their methodology is summarised in Appendix 2. They report a current MRP estimate for the Australian market of approximately 7.5%. This estimate does not include any assumed value of dividend imputation tax credits. If gamma is set to 0.5 as in the

³⁴ QRN 2010 Draft Decision, p. 41.

³⁵ QRN 2009 Draft Decision, p. 14.

³⁶ Envestra Draft Decision, Appendix B, p. 39.

³⁷ Zenner and Junac (2012), p. 3.

³⁸ Zenner and Junac (2012), p. 3.

QCA's 2010 QRN Decision, the total implied required return on equity for the average firm (equity beta of 1.0) is approximately 11.5%, with an implied MRP (including imputation credits) of approximately 8.5%.³⁹

Response to Discussion Paper

QCA consideration of dividend growth model evidence

99. We note that the QCA gives 25% weight to the Cornell method in determining its estimate of MRP. The QCA also notes that this is consistent with the advice that it has received from its consultant Lally (2011), who recommends that some form of dividend growth model should be considered as part of a range of evidence when estimating MRP.⁴⁰
100. Although the QCA performs an estimate of MRP using the Cornell method, and those estimates vary across different market conditions, the outcome is that the QCA has set the MRP to 6% in every determination it has made. That is, under the current QCA approach, the estimate of MRP will inevitably be 6% regardless of the estimate from the Cornell method.
101. Despite this, the Discussion Paper sets out the QCA's view that it does not adopt a long-term MRP of 6%, but rather that it also considers forward-looking evidence:

Dr Lally also rejects CEG's third claim, specifically that the general practice of Australian regulators is to estimate a long term market risk premium (of 6.0%). Dr Lally observes that the AER and QCA both estimate a market risk premium that reflects both current and long term factors. For example, the Authority applies two methods that involve long term historical data but two other methods that are forward-looking. As a result, CEG's claim in this respect is significantly less relevant for the AER and QCA than for regulators who estimate a strictly long term market risk premium (Lally, 2012b: 12).

102. This view is difficult to reconcile with the fact that, in practice, the QCA had set MRP to 6% in all of its determinations to date – even when other Australian regulators are adopting different values. This may give rise to a semantic debate about whether or not the QCA really has “had regard to” the evidence from dividend growth models, but the more important question is whether the current QCA approach of applying an *effectively* fixed MRP of 6% to the contemporaneous government bond yield is appropriate.

Use of firm-level dividend growth model

103. The MRP Discussion Paper also considers the application of the dividend growth model to individual firms to obtain a direct estimate of the required return on equity for a particular firm, or set of firms. Specifically, the firm-level DGM could be applied to the same set of comparable firms that the QCA uses to estimate beta, gearing and credit rating – to obtain a direct estimate of the required return on equity for those firms. The Discussion Paper provides three reasons for rejecting that approach, on the basis of advice from Lally (2011):

³⁹ Assuming a risk-free rate of approximately 3% and MRP of approximately 7.5%, the required return on equity for the average firm is 10.5%. Grossing up for the assumed value of imputation credits gives: $10.5\% \left[\frac{1 - 0.3(1 - 0.5)}{1 - 0.3} \right] = 11.5\%$ which implies a

grossed-up MRP of 8.5%.

⁴⁰ QCA MRP Discussion Paper, p. 17.

- a) Unreliable set of comparable firms: There are likely to be relatively few Australian exchange-listed infrastructure firms that are comparable to the firm being regulated. The reliability of any estimate is a concern when the sample size is small;
- b) Market inefficiency: The Discussion Paper argues that the DGM “assumes that the current share price of the firm matches the present value of future dividends per share. As a result, if that price is actually less (greater) than the present value of future dividends, then the resulting cost of equity estimate will be too high (low).”⁴¹ That is, if observed market prices are systematically biased relative to fair value, they should not be used; and
- c) Corporate manipulation: The Discussion Paper argues that under the firm-level DGM “the regulated firm has an incentive to manipulate its retention rate to increase its cost of equity.”⁴² That is, regulated firms may replace their efficient dividend payout policies with a different policy that is designed to trick the regulator into allowing them a higher return on equity.

104. The first of these reasons is legitimate – the available sample of Australian firms is inevitably small when this sort of analysis is being applied to a single industry (e.g., there are only five listed energy distribution firms and even fewer listed rail firms). We agree with the QCA that a very small sample may provide unreliable results. For this reason, we would advocate that regard should be had to all relevant data rather than confining the data that can be examined to a very small sample. Of course, it is the same set of firms that is available when estimating equity beta and gearing. It would be difficult to explain how a particular sample could produce a reliable estimate of beta but could not produce any relevant information about the required return on equity.

105. The second reason is based on market inefficiency – the possibility that observed market prices may be systematically above or below their true values. There are two problems with this contention:

- a) The QCA only states that there would be an issue “if” market prices are systematically biased. No evidence has been presented to suggest that prices *are* systematically biased or about the direction of the bias; and
- b) The same point would apply to *all* market prices. For example, the risk-free rate would be underestimated if government bond prices were actually less than the present value of future coupon payments.

106. The third reason is that regulated firms would alter their dividend payout policies in order to trick the regulator into allowing them a higher return on equity. It is an extraordinary proposition that officers and directors of a public corporate would deliberately employ a sub-optimal dividend payout policy in an attempt to trick their regulator into allowing them unreasonably high returns. As a general rule, the design of regulatory approaches should not be based on what might happen as a fanciful theoretical possibility.

107. In summary, our view is that the regulator should have regard to all relevant models, methods, data and evidence. We consider that the dividend growth model applied to comparable firms is relevant information and that the QCA should have regard to it in determining the allowed return on equity.

⁴¹ QCA MRP Discussion Paper, p. 17.

⁴² QCA MRP Discussion Paper, p. 17.

7. The use of survey responses

Overview

108. There have been a number of regulatory developments on the appropriate use of survey data in the last two years. The use of survey data has been the subject of merits review before the Australian Competition Tribunal and has also featured prominently in the AER's recent Draft Decisions for Victorian gas businesses.

Current AER use of survey responses

109. 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.⁴³

110. The AER sought advice on this issue from McKenzie and Partington (2011, 2012) who conclude that survey evidence suffers from "potential problems."⁴⁴ 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; and
- h) the relevance of some of the surveys is unclear given changes in market conditions since the surveys were conducted.

111. McKenzie and Partington (2012) conclude that:

Despite the potential problems, we give significant weight to the survey evidence.⁴⁵

⁴³ Envestra Draft Decision, Appendix B, p. 34.

⁴⁴ McKenzie and Partington (2012), p. 19.

⁴⁵ McKenzie and Partington (2012), p. 19.

QCA recognition of the problems with survey data

112. In its MRP Discussion Paper, the QCA also properly recognises a number of problems with the use of survey data:

The weaknesses of survey estimates are that they are sensitive to recent equity price movements. The implication is that the estimates tend to reflect the immediate past rather than the future, which is the opposite of the expectation being sought. Survey estimates are also sensitive to the way in which the survey questions are asked (i.e. ‘framing bias’). Finally, survey estimates are sample-dependent. For example, surveys of academics tend to provide lower estimates than surveys of investors (Damodaran, 2012: 18).⁴⁶

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

113. 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 regulator (the AER in that case) had 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.⁴⁷

114. 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.

115. None of these requirements are met by the survey responses on which the QCA has previously 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 below 3%. Any surveys that were administered in materially different market conditions

⁴⁶ MRP Discussion Paper, p. 24.

⁴⁷ Application by Envestra Ltd (No 2), ACompT 3, Paragraphs 162-163.

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 Case⁴⁸);
 - 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.

Only if all of these requirements are met will the survey response be consistent with the QCA'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.

116. In its MRP Discussion Paper, the QCA relies on a single survey – the unpublished working paper of Fernandez et. al. (2011). That paper posed a single question to potential respondents on the value of MRP: “The market risk premium that I am using in 2011 for my country is X%?” The respondents were not asked what they were using the market risk premium for, how they were using it, or what values they were using for any other parameters. For example, some of the survey responses were analysts for stockbroking firms. They may be using an MRP number to assist them in making a case that their clients should buy shares in a particular firm. Many of the responses were from university lecturers who may be using an MRP number in their class examples, and so on.

117. Moreover, the survey was administered in March 2011 when the yield on 10-year Commonwealth Government bonds was 5.5%. At the time of the MRP Discussion Paper, the yield had fallen to 2.95%. It is entirely possible that some of the survey respondents use a long-run historical MRP estimate together with a long-run historical estimate of the risk-free rate. It is also entirely possible that the MRP that respondents were using in a market where government bond yields are 5.5% is

⁴⁸ ACompT 8 (2009).

materially different from the estimate that would be used in a market where government bond yields are 2.95%.

118. The Fernandez et. al. (2011) survey has only 40 responses in relation to the Australian market – 15 academics, 21 broker analysts, and 4 corporate managers. Their responses ranged from 3% to 14%.

119. In summary, the Fernandez et. al. (2011) survey is:

- a) Not timely, in that respondents were surveyed in market conditions that were materially different from those at the time of the MRP Discussion Paper;
- b) Unclear, in that there is no information about what the respondents used the MRP estimate for, how they used it, or how its value might be related to other parameters such as the risk-free rate; and
- c) Unrepresentative, in that there were only 40 respondents and no information about the non-response rate.

120. It is difficult to imagine that any survey could fare worse against the criteria set out by the Tribunal.

Adjustment for imputation credits

121. Under the Australian regulatory approach, 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.⁴⁹

122. The overwhelming weight of evidence is that market practitioners make no adjustment for imputation credits. The AER 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.⁵⁰

123. In summary, we require an estimate of MRP that includes the regulator's 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 estimated – it is a mechanical function of the regulator'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:

⁴⁹ McKenzie and Partington (2012), p. 18.

⁵⁰ WACC Review Final Decision, p. 407.

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

124. In summary, an adjustment should be made and Handley (2008) has set out precisely how to do it. 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.
125. 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 QCA proposes to use. Consequently, an adjustment would still have to be made to avoid an apples-with-oranges comparison.

Conclusions in relation to survey data

126. In our view, the best information about the prevailing conditions in the market for funds comes from traded prices drawn from the market for funds, rather than from survey responses. We note that this view is consistent with the recent directions from the Tribunal.

8. Regulatory recognition of the relationship between risk-free rates and market risk premium

NSW retail electricity prices

127. 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 pushdown 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.⁵¹

128. 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.⁵²

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.⁵³

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.⁵⁴

Tribunal precedent

129. 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.”⁵⁵

130. The Tribunal case that considers the relationship between government bond yields and the market risk premium is the Energy Australia Case.⁵⁶ One of the applicants in that case, TransGrid, was

⁵¹ IPART (2012), p. 104.

⁵² IPART (2012), p. 107.

⁵³ IPART (2012), p. 107.

⁵⁴ IPART (2012), p. 107.

⁵⁵ IPART (2012), p. 108.

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.

131. 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.
132. 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.

133. 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.⁵⁷

and concluded that:

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.⁵⁸

134. 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 – implicit consistency of risk-free rate and MRP

135. 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.⁵⁹ 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

⁵⁶ [2009] ACompT 8.

⁵⁷ [2009] ACompT 8, Paragraph 112.

⁵⁸ [2009] ACompT 8, Paragraph 114.

⁵⁹ IPART estimated the risk-free rate and MRP with reference to the yield on 10-year Commonwealth Government Securities.

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.”

136. 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.⁶⁰

137. 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.⁶¹

138. 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%.⁶² This estimate of the required return on equity is consistent with either:

- a) Increasing the risk free rate from the contemporaneous estimate of 3.7% to a longer-term average estimate of 5.2%; or
- b) Adopting a contemporaneous MRP estimate of 7.5%.

Submissions to IPART

139. 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 4 below, which shows the time series of 20-day moving average of the yield on 10-year Commonwealth Government bonds.⁶³

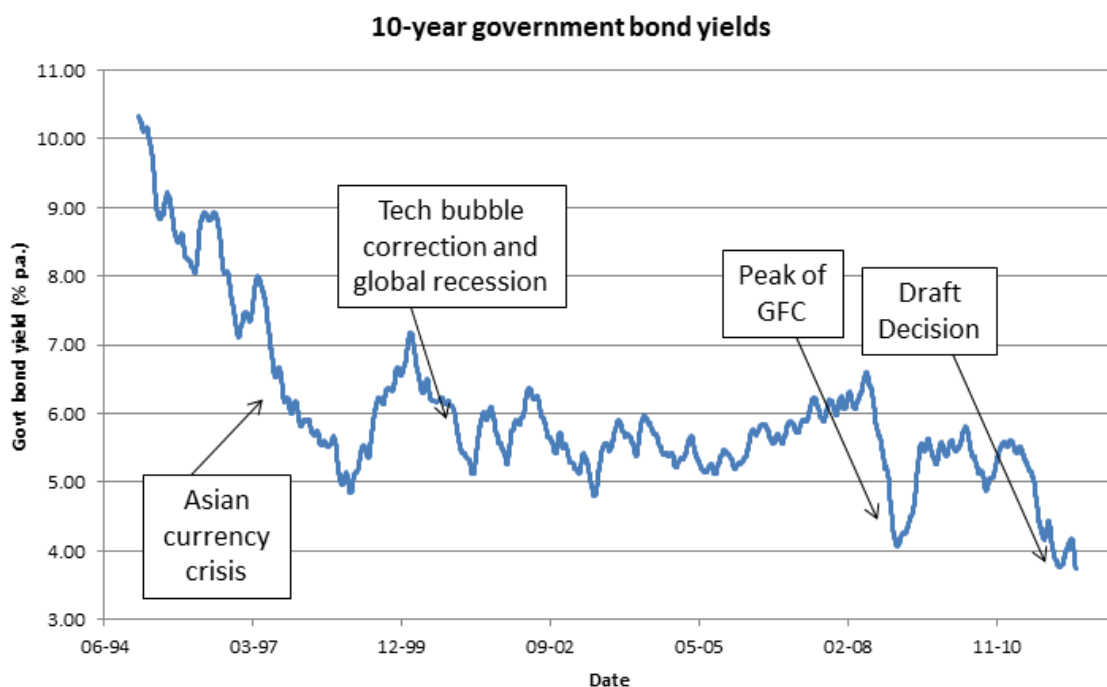
⁶⁰ IPART (2012), p. 102.

⁶¹ IPART (2012), p. 107.

⁶² 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%.

⁶³ This figure is part of the material that led IPART to modify its previous approach to obtain a more commercially reasonable outcome. The reference to the Draft Decision in that figure is a reference to IPART’s retail electricity draft decision, which was subsequently amended.

Figure 4. 10-year government bond yields

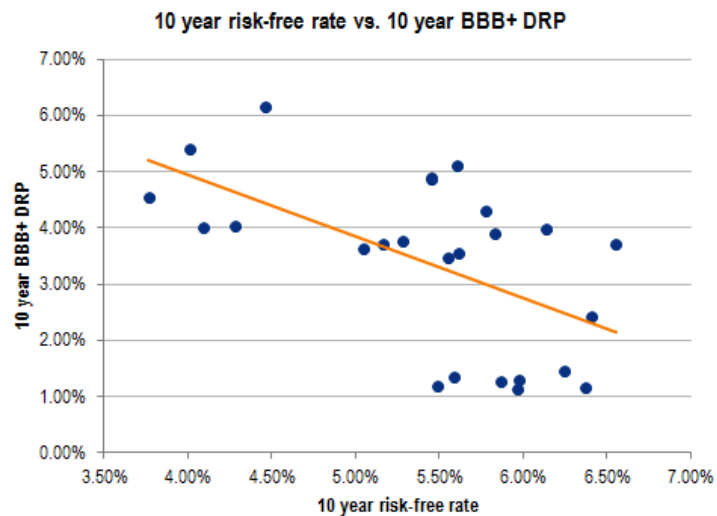


Source: Reserve Bank of Australia.

140. 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.
141. 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 4 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.
142. 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.
143. Queensland Treasury Corporation (QTC) have also examined the relationship between 10-year Commonwealth Government bond yields and risk premiums in financial markets. Figure 5 below shows the relationship between 10-year government bond yields and estimates of the 10-year debt risk premium.⁶⁴ 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.

⁶⁴ 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.

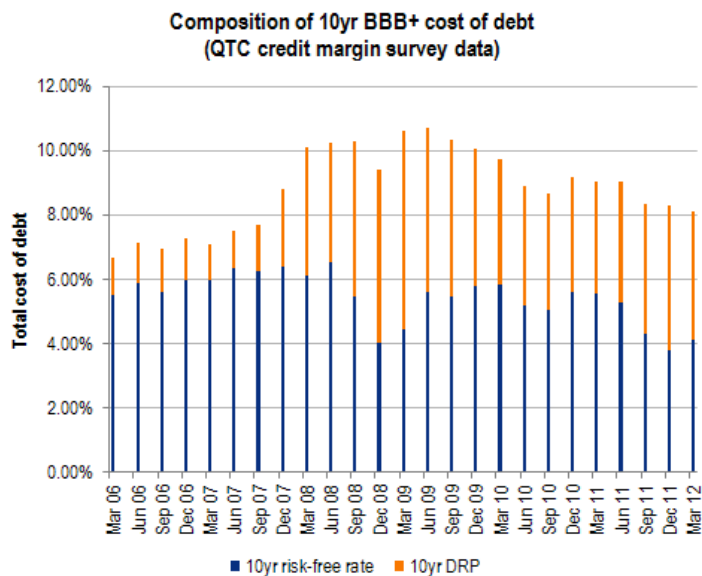
Figure 5. Inverse relationship between government bond yields and risk premiums in financial markets



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.

144. Another way to consider this relationship is to observe the stability of the total corporate bond yield, relative to its component parts – the 10-year government bond yield and the DRP. Figure 6 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.

Figure 6. 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

145. 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:⁶⁵

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.⁶⁶

146. 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.⁶⁷

147. 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.⁶⁸

148. 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 2 below.

Table 2. 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.

⁶⁵ IPART used 5-year government bond yields as a proxy for the contemporaneous risk-free rate in this case.

⁶⁶ IPART, Sydney Desalination Plant Final Decision, p. 80.

⁶⁷ IPART, Sydney Desalination Plant Final Decision, p. 94.

⁶⁸ IPART, Sydney Desalination Plant Final Decision, p. 94.

149. 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 3 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.⁶⁹ IPART considered this to be unreasonable and instead adopted a value of 11.4%, which 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%.

Table 3. Sydney Desalination Plant: Regulatory estimates of the required return on equity

	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

150. 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:⁷⁰

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.⁷¹

151. 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).⁷²

⁶⁹ That is, a firm with an equity beta of 1.0.

⁷⁰ IPART used 5-year government bond yields as a proxy for the contemporaneous risk-free rate in this case.

⁷¹ IPART, Sydney Water Final Decision, p. 198.

⁷² IPART, Sydney Water Final Decision, p. 210.

152. 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:

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.⁷³

153. 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. Table 4 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.⁷⁴ IPART considered this to be unreasonable and instead adopted a value of 11.4%, which is consistent with either:

- 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%.

Table 4. 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.

⁷³ IPART, Sydney Water Final Decision, p. 210.

⁷⁴ That is, a firm with an equity beta of 1.0.

9. Alternative approaches and the way forward for the QCA

The focus of the Discussion Paper

154. The QCA's MRP Discussion Paper is written from the perspective that the required return on equity will be estimated using only the Sharpe-Lintner CAPM and that the risk-free rate and MRP can each be estimated independently. The focus of the Discussion Paper is (separately) on:
- a) Whether government bond yields satisfy a set of theoretical requirements for use as a proxy for the risk-free rate in the Sharpe-Lintner CAPM; and
 - b) Whether, in theory, a regulator should seek to estimate MRP in order to match its regulatory allowance with the efficient cost of equity at each determination; the alternative being to have periods of material under- and over-compensation that might average out over the long run.
155. For example, the MRP Discussion Paper and the Lally Report both contain detailed discussions about how a flight-to-quality has resulted in government bond yields being at historical lows, followed by theoretical assessments of whether or not this disqualifies them from being used as estimates of the risk-free rate. There is discussion of explicit and implicit requirements for a suitable proxy of the risk-free rate for use in the CAPM, and a conclusion that current government bond yields do not violate any theoretical requirement.
156. Similarly, there is a theoretical discussion about whether the regulator should seek to match the regulatory allowance with the efficient cost of equity at the time of each determination, or whether a type of NPV=0 principle applies. The MRP Discussion Paper states that:

Dr Lally considers that the critical feature of compensation is that it should be provided over the life of the regulatory assets rather than over each regulatory cycle within the life of the assets. As a result, while a regulator's estimation process might yield a biased estimate of a parameter (e.g. the market risk premium) under certain economic conditions, the more relevant consideration is the accuracy of the method over the life of the regulated assets. In other words, a method for estimating the market risk premium should not be rejected simply because it is biased under certain economic conditions (Lally, 2012b: 13).⁷⁵

157. This implies that periods of material over-compensation and periods of material under-compensation are acceptable, so long as they average out over time. In such a case, a theoretical mathematical derivation might be able to show that the net present value of regulatory revenues is the same whether the regulator (a) seeks to allow a fair return at every determination, or (b) has some determinations with material over-compensation and equally many determinations with material under-compensation. However, there are real-world implications if the regulatory allowance is materially different from the efficient cost of equity:
- a) If the regulatory allowance is materially greater than the efficient cost, consumers will be over-paying for the regulated service. This is obviously to the short-term disadvantage of consumers and will also be to their long-term disadvantage if the mis-pricing leads them to take inefficient actions such as seeking a less efficient source of energy or delaying their own capital investment because the inflated regulated price renders their own project uneconomical; and

⁷⁵ QCA MRP Discussion Paper, pp. 16-17.

- b) If the regulatory allowance is materially less than the efficient cost, the regulated service provider will have an incentive to under-invest in efficient capital and operating expenditure which may lead to higher future prices and/or lower than efficient levels of service – neither of which are in the long-term interests of consumers.

158. But the key issue is that detailed theoretical tangents (about what a particular model assumes about the features of a proxy for the risk-free rate and about whether “a method for estimating the market risk premium should not be rejected simply because it is biased”) misses the main point. The key question is whether one obtains a reasonable estimate of the required return on equity in the current market conditions by mechanically inserting the current government bond yield into the Sharpe-Lintner CAPM with an MRP of 6%. In our view, the answer to that question is simple – the current QCA approach gives the nonsensical result that the onset of the GFC has resulted in equity being cheaper than ever before. Thus, there is an opportunity for the QCA and stakeholders to follow other Australian regulatory developments in developing a framework that is robust to the current financial market conditions.

159. To focus on selected micro-theoretical issues in relation to individual parameters would be to miss the point entirely. Rather, all stakeholders should be considering whether a particular approach produces an estimate of the required return on equity that is reasonable and plausible in the circumstances. This is because such a focus on the reasonableness of the allowance for the return on equity is required by the Queensland Competition Authority Act 1997, which states that the regulatory allowance should:

promote the economically efficient operation of, use of and investment in, significant infrastructure by which services are provided, with the effect of promoting effective competition in upstream and downstream markets.⁷⁶

and that:

The pricing principles in relation to the price of access to a service are that the price should generate expected revenue for the service that is at least enough to meet the efficient costs of providing access to the service and include a return on investment commensurate with the regulatory and commercial risks involved.⁷⁷

160. In our view, it is impossible to reasonably conclude that the above requirements of the QCA Act are met by setting, in the current financial market conditions, an allowed return on equity that is lower than at any time in the historical record. This conclusion holds whether or not certain technical conditions about model requirements of risk-free rate proxies are met, and whether or not there might exist certain theoretical conditions under which a material bias in the regulatory estimate of MRP might cancel out in the long run.

161. The MRP Discussion Paper, and the associated consultant report, devote considerable attention to independent theoretical considerations relating to individual parameters, but do not consider the overall estimate of the required return on equity. However, the fact that the current QCA approach produces estimates of the required return on equity that are the lowest on record since the onset of the GFC is something that all stakeholders should consider. Determining whether the allowed return on equity is reasonable is more important than setting out lists of explicit and implicit theoretical requirements of risk-free rate proxies.

⁷⁶ QCA Act, s.69E.

⁷⁷ QCA Act, s.168A.

The new framework in energy network regulation

162. Until recently, the Australian Energy Regulator (**AER**) had adopted an approach similar to the QCA's current approach to estimating the required return on equity in that it:

- a) Used the Sharpe-Lintner CAPM exclusively;
- b) Estimated individual parameters in isolation, resulting in it using contemporaneous government bond yields as a proxy for the risk-free rate and a 6% MRP; and
- c) Focused on the justification for individual parameters rather than on the reasonableness of the resulting estimate of the required return on equity.

163. In its recent rule change process, the Australian Energy Markets Commission (**AEMC**) made a number of significant changes to the National Electricity Rules (**NER**) and National Gas Rules (**NGR**) to prevent the AER from continuing to adopt that approach. The key changes that the AEMC made were:

- a) To introduce an “overall rate of return objective” to ensure that the focus is on the reasonableness of the allowed return on equity – eliminating the silo approach that focused separately on each individual parameter; and
- b) Requiring the regulator to have regard to all relevant approaches and evidence – eliminating the focus on a single model (CAPM) that could be used without having regard to a weight of evidence suggesting that the way the regulator implemented that model produced an estimate of the required return on equity that was implausible in the circumstances.

164. In particular, the new rules require that the allowed rate of return must achieve the **allowed rate of return objective**:

[t]he rate of return for a [Service Provider] is to be commensurate the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the [Service Provider] in respect of the provision of [services].⁷⁸

165. In applying the rate of return objective, regard must be had to:

1. relevant estimation methods, financial models, market data and other evidence;
2. the desirability of using an approach that leads to the consistent application of any estimates of financial parameters that are relevant to the estimates of, and that are common to, the return on equity and the return on debt; and
3. any interrelationships between estimates of financial parameters that are relevant to the estimates of the return on equity and the return on debt.⁷⁹

166. When determining the allowed return on equity regard must also be had to

the prevailing conditions in the market for equity funds.⁸⁰

⁷⁸ For example, see Rule 87(2)(3) of the NGR.

⁷⁹ For example, see Rule 87(2)(5) of the NGR.

⁸⁰ For example, see Rule 87(2)(7) of the NGR.

167. In its Final Determination, the AEMC was very clear about its intention that the regulator should not use a narrow formulaic approach, but should have regard to all relevant evidence while keeping a focus on the reasonableness of the allowed return on equity. For example, the AEMC noted that

The Commission also expressed concern that the provisions create the potential for the regulator and/ or appeal body to interpret that the best way to estimate the allowed rate of return is by using a relatively formulaic approach. This may result in it not considering the relevance of a broad range of evidence, and may lead to an undue focus on individual parameter values rather than the overall rate of return estimate.⁸¹

and that the rule changes were designed to:

encourage the regulator to focus on whether its overall estimate of the rate of return is appropriate.⁸²

168. The AEMC was also very clear about the need to ensure that the allowed return on equity is commensurate with the prevailing conditions in the market for equity funds. The AEMC stated that:

If the allowed rate of return is not determined with regard to the prevailing market conditions, it will either be above or below the return that is required by capital market investors at the time of the determination. The Commission was of the view that neither of these outcomes is efficient nor in the long term interest of energy consumers.⁸³

and:

The second principal requirement is that the return on equity must take into account the prevailing conditions in the market for equity funds. It reflects the importance of estimating a return on equity that is sufficient to allow efficient investment in, and efficient use of, the relevant services. However, this requirement does not mean that the regulator is restricted from considering historical data in generating its estimate of the required return on equity. Rather, it ensures that current market conditions are fully reflected in such estimates to ensure that allowed rates are sufficient for efficient investment and use.⁸⁴

169. The AEMC also noted that for a framework to produce an allowed return on equity that is commensurate with the prevailing conditions in the market for equity funds, it must be flexible enough to respond to changes in financial market conditions. One of the AEMC's primary concerns was that the mechanistic CAPM approach was "inherently rigid" such that the AER's implementation of the CAPM produced unreasonable results in the current market circumstances. The AER stated that:

⁸¹ AEMC Rule Change Final Determination, p.40.

⁸² AEMC Rule Change Final Determination, p.41.

⁸³ AEMC Rule Change Final Determination, p.44.

⁸⁴ AEMC Rule Change Final Determination, p.69.

The global financial crisis and its continuing impact through the European sovereign debt crisis have highlighted the inherent dangers in an overly rigid approach to estimating a rate of return in unstable market conditions.⁸⁵

and that its rule change would:

enable the regulator to better respond to changing financial market conditions.⁸⁶

170. In its Final Determination Guidance, the AEMC sought to address concerns that, despite its best efforts in making material changes to the Rules, the regulator would seek to continue to estimate the required return on equity via a mechanistic implementation of the CAPM. The AEMC sought to assuage these concerns, but indicated that it would not set out a list of what other information and models the regulator should consider, due to the risk that any such list *itself* would be applied in a mechanistic fashion:

A major concern expressed in numerous submissions is that under the proposed changes the regulator would still be able to, in effect, make exclusive use of the CAPM when estimating a rate of return on equity. The Commission understands this concern is potentially of considerable importance given its intention is to ensure that the regulator takes relevant estimation methods, models, market data and other evidence into account when estimating the required rate of return on equity. As discussed above, the Commission takes the view that the balance between flexibility and prescription has been adequately achieved in the final rules. It would be counterproductive to attempt to prescribe a list of models and evidence, which would almost certainly be non-exhaustive and could lead to rigid adherence to them in a mechanistic fashion.⁸⁷

171. Rather:

To determine the rate of return, the regulator is also required to have regard [to] relevant estimation methods, financial models, market data and other evidence. The intention of this clause of the final rule is that the regulator must consider a range of sources of evidence and analysis to estimate the rate of return. In addition, the regulator must make a judgement in the context of the overall objective as to the best method(s) and information sources to use, including what weight to give to the different methods and information in making the estimate. In doing so, the regulator should also have regard to taking an internally consistent approach and, to the greatest extent possible, use consistent estimates of values that are common across the process, as well as properly respecting any inter-relationships between values used.⁸⁸

and

Implicit in this requirement to consider a range of methods, models and information is that checks of reasonableness will be undertaken.⁸⁹

⁸⁵ AEMC Rule Change Final Determination, p.40.

⁸⁶ AEMC Rule Change Final Determination, p.23.

⁸⁷ AEMC Rule Change Final Determination, p.57.

⁸⁸ AEMC Rule Change Final Determination, pp. 67-68.

⁸⁹ AEMC Rule Change Final Determination, p. 69.

The way forward for the QCA

172. Although the QCA does not operate under the NGR or NER, the information set out above is useful in that it indicates the direction of regulatory practice in this country. In relation to the allowed return on equity, Australian regulatory practice is moving away from the mechanistic implementation of a single model with a narrow independent focus on individual parameters. It is moving towards an examination of all relevant evidence with a primary focus on achieving an estimate of the required return on equity that is reasonable in the circumstances.
173. In the context of its cost of capital review, the QCA has an opportunity to follow the current direction of regulatory practice in Australia:
- a) The **AEMC** has changed the NER and NGR to require energy network regulators to have regard to all relevant methods, models, data and evidence and to have a primary focus on achieving an estimate of the required return on equity that is reasonable in the circumstances. It has ruled out the previous mechanistic implementation of the CAPM using the current government bond rate and $MRP=6\%$;
 - b) The **AER** and **ERA** are required to follow the path set out by the AEMC and are currently in the process of consulting with stakeholders and developing guidelines to explain their new approach. The new approach of the AER will undoubtedly have some influence on the practice of the **ACCC**;
 - c) **IPART** has already departed from the mechanistic CAPM due to their conclusion that it does not produce sensible estimates of the required return on equity in the current market conditions. IPART is also conducting a review to determine how to best estimate the required return on equity going forward; and
 - d) In its most recent decision, the Independent Competition and Regulatory Commission (**ICRC**) has departed from the mechanistic CAPM and used a range of evidence to determine the allowed return on equity.⁹⁰
174. In summary, Australian regulatory practice has already moved beyond the mechanistic implementation of the CAPM. The QCA has a present opportunity to move in the current direction of regulatory practice in Australia.
175. Whereas a WACC review in the context of the continued mechanistic implementation of the CAPM would be structured with independent work streams for individual parameters, the current approach of other regulators involves widespread consultation on issues about the range of methods, models, data and evidence that is relevant, and the process by which it should all be distilled into an allowed return on equity.

⁹⁰ We would not advocate following the specific ICRC approach, but simply note here that the ICRC is another regulator that has already moved beyond the mechanistic CAPM.

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Appendix 1: UBS dividend growth model methodology

This appendix sets out the dividend growth methodology adopted by Nelson, Ferrarone and McGuire (2012), as it appears in that publication.

Deriving the Implied Risk Premium

The equity risk premium (ERP) reflects the difference between equity market returns and the returns on the 'risk-free' asset, typically the government bond or Treasury bill rate. The premium amounts to the added compensation required to hold the riskier asset-equities. Keeping all else constant, changes in the equity risk premium have a straightforward impact on stock prices: a rise in the equity risk premium depresses stock prices, and vice versa. It follows that a high equity risk premium is associated with depressed stock prices, a low premium with elevated stock prices.

Estimates of the ERP vary according to the model employed. An important distinction must be made between historic and forward-looking measures of the equity risk premium. The basic problem with ex-post (historical) premiums, calculated as the observed difference between past returns on stocks and government bonds, is that past patterns may not hold in the future.

The alternative we employ is a measure of the *ex ante* (or 'forward-looking') risk premium, which attempts to capture investor expectations. This implied equity risk premium is derived from a discounted cash flow model, which equates discounted future streams of earnings (cash flows) to prevailing market valuations. The equilibrating factor is the discount rate, which is the sum of the risk-free rate and the equity risk premium. Subtracting the long-term bond yield from the discount rate yields the implied equity risk premium.

In order to construct a historical series for the ERP it is necessary to gather information on what investors believed the future would look like at any given point of time in the past. Since such expectations can not be known with certainty, suitable proxies must be found. The approach used here assumes that cash flows grow proportionally to earnings, whose expected growth rate at any point in time is given by the consensus IBES estimates. These earning estimates span an initial horizon of five years. Thereafter, we assume earnings (cash flow) growth decays to its long-run equilibrium growth rate, which is proportional to forward-looking, dynamic estimates for nominal GDP.

Model specification

In the context of developing a DCF model to determine the implied risk premium, it is important to identify and discuss the underlying assumptions used in its construction.

Return to Shareholders

The first assumption concerns the return to shareholders. Typically, dividends are considered as the return to shareholders. However, dividends may not fully capture the true capacity of companies to repay investors. For example, cash can also be returned to shareholders via share buy backs. We therefore assume that shareholder returns are best proxied by free cash flow to equity (FCFE). This can be described as a model where potential dividends and share buy-backs are discounted and therefore represents a measure of what a firm can afford to pay out.

The formula for FCFE expresses the cash flows available to equity after meeting all financial commitments, including debt repayments, and after covering capital expenditure and working capital needs.

FCFE = Net Income - ((Common Equity % Total Capital) x (Capital Expenditure - Depreciation & Amortisation +(-) Δ Working Capital + Acquisitions)) - Preferred Dividends

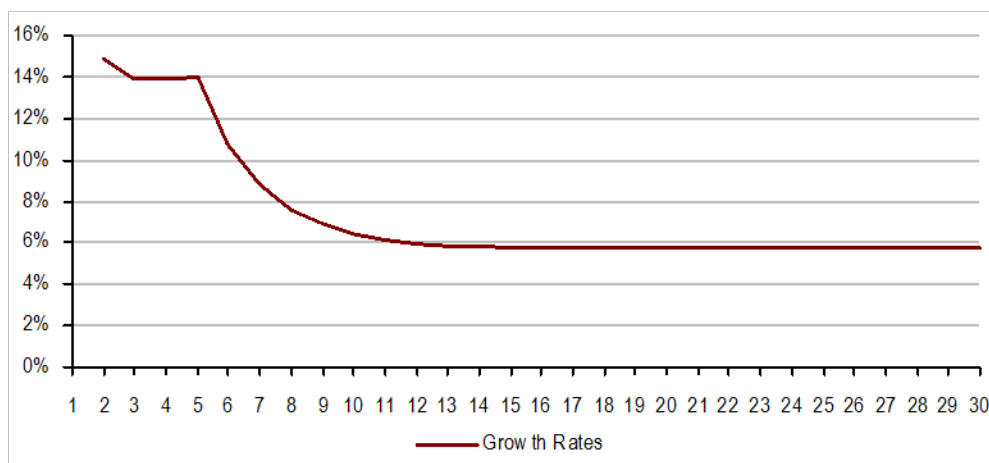
If we assume that net capital expenditures and working capital changes are financed using a mixture of debt and equity, the effect on cash flows to equity can be expressed as common equity as a % of total capital. We then take the net income and convert it to a cash flow by deducting the reinvestment needs such as capital expenditures and acquisitions. Depreciation is added back to earnings because it is a non cash charge deducted in the accounts to arrive at net income. Changes in working capital will be deducted or added to net income depending on whether an increase or decrease has occurred. Increases in working capital drain a firms cash flow, while decreases in working capital increase the cash

flow available for distribution.

Three-stage model

There exists several versions of the DCF model, from the simplest Gordon growth model to multi stage models. The Gordon growth model assumes that a company will grow at a stable rate into the future, and while this may hold true for sectors such as regulated utilities it is not representative of the future of the majority of companies. We therefore turn to a more complex three stage model, which breaks the DCF model into 3 different stages of growth.

We employ the IBES one-year and 3-5 year estimates as proxies for the first two earnings stages, respectively. In most cases, however, the 3-5 year IBES forecasts are significantly higher than reasonable estimates for long-run nominal economic growth, a condition that cannot exist in perpetuity. (Otherwise profits would gradually absorb all of national income). A transition therefore must occur between the growth rates forecast by analysts for the first five years and the long run sustainable earnings growth rate. Accordingly, from the fifth year the model fades earnings growth rates exponentially to the long run forecasts for economic growth. To make the model tractable, we must specify a terminal period, for which we have chosen 30 years.



Source: UBS

Terminal growth

A key assumption of any DCF model is the value of terminal growth. We believe that terminal growth assumptions should change with changes in expected long-run nominal economic growth (owing to shifting assumptions about factors such as labor force growth, productivity, or inflation). Instead of assuming a constant terminal value for growth, we therefore employ long-term economic forecasts to tie down terminal earnings growth estimates. In the case of the U.S., the Livingston Survey provided by the Federal Reserve Bank of Philadelphia offers long-term nominal GDP estimates from 1990. (From 1985-the beginning of the IBES series-until 1990 we employ trailing 10-year nominal GDP growth to proxy terminal growth.). For non-US countries and regions, we use the consensus forecasts for long-term economic growth provided by Consensus Economics.