Draft Report on Regulated Retail Electricity Prices 2012-13

AGL submission to the Independent Pricing and Regulatory Tribunal

Date: 11 May 2012

AGL

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Executive Summary

AGL welcomes this opportunity to provide comment on the Draft Report into 2012/13 regulated retail electricity prices released by the Independent Pricing and Regulatory Tribunal *(IPART)*.

The Draft Report has shown that the key impact on wholesale energy costs from 1 July 2012 is the introduction of a carbon price under the Clean Energy Act 2011. While AGL is in general agreement on IPART's approach to account for carbon costs, AGL has some concerns about the assumptions which underlie the updated calculation of long run marginal cost (LRMC) of generation used to set the energy purchase cost (EPC) allowance. Specifically, AGL considers that the following factors have been mis-specified:

- The weighted average cost of capital, which has been reduced from 7.8% to 6.5% pre-tax real, and

- The short-run marginal cost of new entrant coal generators.

AGL has also taken the opportunity to consider the Recommendations made by IPART in its Draft Report in relation potential regulation of NSW electricity prices into the future. In AGL's view, the current approach to setting the EPC has been highly successful in fostering competition and providing long-term certainty for the NSW retail electricity market.

1. General Comments

IPART's *Changes in regulated electricity retail price from 1 July 2012, Electricity – Draft Report, April 2012* (**Draft Report**) has shown that increases in retail electricity prices from 1 July 2012 will be due mainly to increases in network charges and the introduction of a carbon pricing mechanism. Network charges are pass-through costs under the "N+R" approach. AGL is broadly satisfied with the approach used by IPART to incorporate the impact of the carbon price into the energy purchase cost (EPC) allowance.

However, AGL is concerned about the reduction in LRMC, used to set the EPC, due to two factors:

- The weighted average cost of capital for generation; and

- The short run marginal cost of new-entrant coal generators.

AGL has provided a detailed discussion of these concerns relating to the calculation LRMC in the following section.

2. Energy Purchase cost allowance

Long run marginal cost of generation

By forecasting a reduction in the 'standalone LRMC' in the Draft Report, IPART has suggested that there has been a reduction in the long-term cost of generation in NSW. Whilst spot markets and short-term futures markets might be lower than historical levels, this does not imply that the long-term cost of generation, and in particular, the cost of capital, has reduced also.

AGL supports the current EPC approach which uses LRMC in setting the wholesale energy cost component of the regulated tariff. AGL does however have concerns with certain input assumptions and the WACC for generation used in the calculation of the LRMC for Standard Retailers regulated loads. Issues associated with the WACC are discussed below in a separate section of the submission.

Short-run marginal cost (SRMC) of new-entrant coal generators

The calculation of the 'stand-alone LRMC' of standard retailers regulated loads assumes that no generation plant currently exists, and therefore a new least-cost generation mix is priced to meet the required load. This approach relies on cost estimates of new entrant generation plant to set the price and optimise the mix of plant to deliver a least cost outcome.

The Frontier Report describes the assumptions and data sources used to develop the costs of the new-entrant generators used to calculate the 'stand-alone LRMC'. AGL is broadly satisfied that the inputs and assumptions have been developed on an appropriate basis and reflect a reasonable basis on which to calculate the LRMC. However, AGL is concerned that in the *Modelling assumptions spreadsheet by Frontier Economics April 2012* the short-run marginal cost (SRMC) of new entrant coal generation is below reasonable market expectation. Table 1 below summarises the SRMC data for existing and new entrant coal fired generation proposed by Frontier.

Table 1 – SRMC by plant ($/MWh, sent out, real $2011-12), extract from
Modelling assumptions spreadsheet by Frontier Economics April 2012

Region	Name	2012/13
NSW	Bayswater	$15.80
	Colongra	$91.85
	Eraring	$19.79
	Hunter Valley GT	$407.96
	Liddell	$16.71
	Mt Piper	$21.48
	Munmorah	$26.46
	Redbank	$14.63
	Smithfield	$41.25
	Tallawarra	$29.96
	Uranquinty GT	$79.74
	Vales Pt	$22.25
	Wallerawang	$23.85
	SC Black Coal_NCEN	$14.04
	SC Black Coal_SWNSW	$11.80

The SRMC range for new entrant generators of approximately $12-$14/MWh is below that of existing conventional generators which ranges from approximately $16-$26/MWh. The SRMC, as described by Frontier, is a function of the fuel cost, heat rate and VOM cost. AGL expects there would be some level of variation in the VOM cost for different generators depending on the specific characteristics and quality of the coal utilised. However, the fuel cost will be the main variable providing the spread of SRMC between existing generators and the new entrant SRMC. This leads AGL to question whether the fuel cost assumptions for the new entrant generators align with reasonable market expectations.

The Frontier Report provides a detailed discussion on the approach used to set coal prices for new entrant generators modelled in the LRMC. Due to concerns about the consistency of coal prices from the 2010 Determination, IPART have dismissed the estimate of prices used in recent regulatory decisions and developed a unique methodology which escalates the coal prices from the "2009 ACIL Report in line with average increases in mining cost indices over the previous ten years".[1] AGL has a number of concerns with this approach:

- Using historical fuel prices escalated by an average increase in mining costs makes no attempt to estimate the impact of current market dynamics on the fuel prices i.e. moves towards export parity prices. Since 2007, Newcastle coal spot prices have grown at a compound annual growth rate of 4.93% on a USD/AUD basis, and 8.83% when exchange rate movements are removed. AGL acknowledge that movements in spot coal prices is not analogous to changes in long term contract prices for electricity generators. However, they do highlight the influence of export demand on local thermal coal prices over the period;

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[1] Frontier Economics, *Energy costs – annual review for 2012/13. A Draft Report prepared for IPART (April 2012)*. Page 12.

- This approach is at odds with other modelling of black coal prices used to estimate the SRMC of new entrant generators in NSW. For example, as part of the 2012 National Transmission and Development Plan (NTNDP) ACIL Tasman have documented a detailed approach for forecasting future thermal coal prices for generation regions of NSW.[2] While AGL notes IPART's concerns with using the broader NTNDP dataset, the process for developing coal prices as part of the NTNDP represents a more rigorous and robust forecasting approach than applied by IPART, and results in a range of NCEN and SWNSW coal prices of $1.80 - $2.60/GJ. AGL estimate that based on these fuel costs the SRMC for new entrant coal generators in these regions would range from $17.39/MWh to $24.59/MWh (assuming a heat rate of 9,000kJ/kWh and VOM $1.19/MWh) ; and

- AGL expects that a new entrant coal generators' fuel costs should be based on a new coal supply contract reflecting the greater influence of export thermal coal prices – while noting that *we are not* suggesting absolute export parity. We consider it most unlikely that a new entrant would be able to source coal at a price that is substantially lower than is available to existing generators given coal market conditions.

The impact of the change in the coal costs for existing generators can be seen through their bidding strategies in the NEM. Generators bid their output into the NEM based on a series of price bands. The nature of a uniform, first-price auction market such as the NEM, combined with the technical operating requirements of a base-load coal-fired generator, means that these generators are incentivised to maintain the minimum stable operating load by bidding that capacity into the market at negative prices. For their first non-negative bid, base-load generators are incentivised to bid that component of their capacity at their SRMC. Bidding at SRMC allows a generator to recover the costs linked to output i.e. fuel and variable operations and maintenance. Typically, the first non-negative bids of base-load generators are fairly stable over time which reflect the fact that unless their fuel costs change, then other factors in the SRMC should not change significantly.

Figure 1 below, shows an extract of the NEM bid price history for the Eraring coal-fired electricity generator from May 2010 to April 2012. These bid prices represent the average of the first non-negative final bids placed for the four units of the Eraring Power Plant which, as discussed earlier, can rightly be interpreted as representative of the SRMC of the generator. For comparative purposes, AGL also plotted a benchmark SRMC calculated using published Newcastle coal spot prices.[3] While drivers of spot prices are different to prices for coal contracted to NSW generators, this provides a useful benchmark of the market based on a published source.

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[2] ACIL Tasman, *Fuel cost projections (Draft Report) – Natural gas and coal outlooks for AEMO modelling (December 2011)*. Page 23.

[3] SRMC calculation assumes a heat rate of 9000kJ/kWh and VOM $1.19/MWh

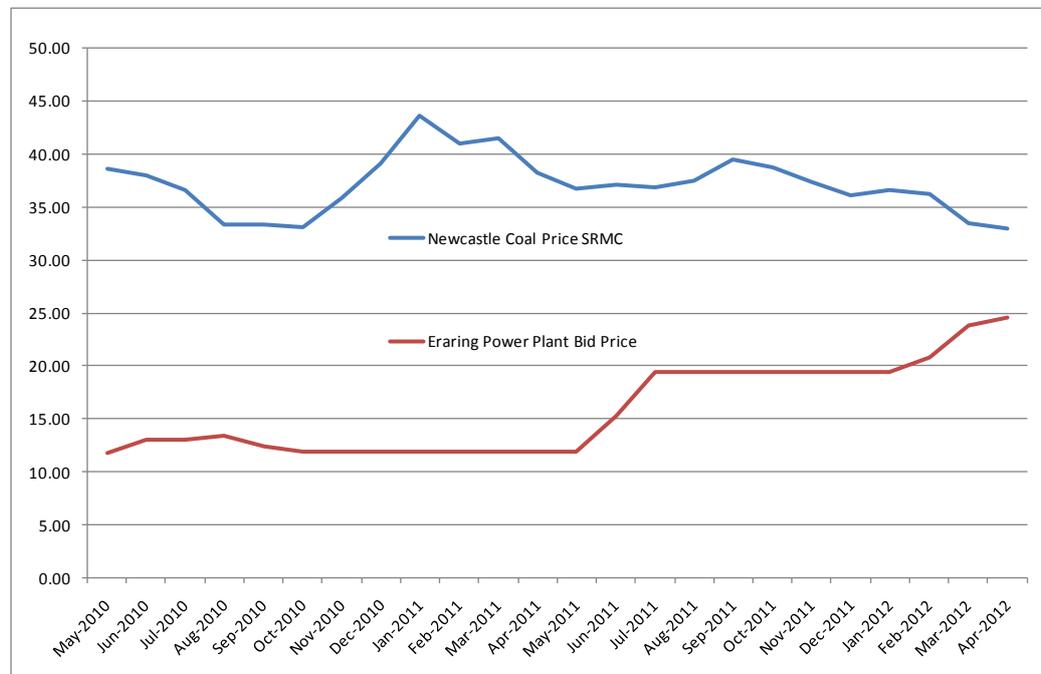**Figure 1 – Eraring Power Plant SRMC vs. SRMC using Newcastle Coal prices**

Figure 1 clearly shows the consistency over recent years in Eraring's first non-negative bid price. There are only a few changes that have occurred and these changes have been significant. It is widely acknowledged in industry that prior to May 2011, Eraring's contracts for coal supply were dominated by old agreements, and around mid-2011 to 2012 of some those contracts rolled-off and new supply contracts were struck.[4] Figure 1 shows that this has resulted in a bid price closer to the SRMC calculated using the Newcastle coal spot price than an $11/MWh SRMC.

On this basis, AGL is of the view that the new entrant coal generator SRMC used in the 'standalone LRMC' modelling underestimates the likely costs for this type of generator, and the new entrant coal generator SRMC should be equivalent to, if not greater, than the SRMC used for equivalent existing generators.

Weighted average cost of capital (WACC)

AGL is concerned that the updates to the Generation and Retail WACC in the Draft Report under estimate the cost of capital available for electricity retail and generation activities. AGL has particular concerns with the process for updating the WACC for Generation which has resulted in a reduction in the real pre-tax WACC from 7.8% in 2011/12 to 6.5% in 2012/13. The resulting WACC for Generation is substantially below what AGL considers a reasonable estimate in the current market, and the resulting reduction in the 2012/13 LRMC is contrary to the change in the cost of generation that the sector is experiencing.

AGL has identified a number of specific issues with IPARTs WACC calculation that result in the cost of capital being below what one would reasonably expect. On this basis, AGL

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[4] Intelligent Energy Systems, *Review of fuel costs. A Report to AEMO – Final. 20th January 2011*. Page 28.

engaged an independent advisory firm, SFG Consulting (SFG), to provide an independent review of the WACC for electricity generation in the Draft Report. AGL has incorporated the findings of SFG in our submission and the Final Report prepared by SFG is included in Attachment 1 of this submission.

AGL's key concerns with the update of the WACC in the Draft Report include:

Difference in Generation and Retail risk free rate

IPART has quoted different risk free rates for Generation and Retail. While the approach to calculate each risk free rate appears the same (i.e. 20-day average of the 10 year Commonwealth Government bond yield), bond yields were sampled over different time periods. Generation was sampled over the 20-day period to 3 February 2012, while Retail was sampled over the 20-day period to 19 March 2012. AGL anticipates that the risk free rate will be updated over a consistent period for both Generation and Retail for the Final Report.

Market risk premium and risk-free rate

IPART defines the market risk premium (MRP) as "the expected return over the risk free rate that investors would require for investing in a well diversified portfolio of risky assets".[5] IPART had set an MRP range in 2010 of 5.5% - 6.5% based on long term averages which according to IPART should account for short to medium term variations from the mean.

AGL is concerned that because IPART has used a significantly lower risk free rate in 2012 by comparison to long-run averages, and while the equity beta and MRP remain constant, this means that the cost of equity used in the WACC has reduced from 10.4% - 12.6% in 2011 to 8.8% - 11.0% in 2012.[6] By keeping the MRP constant and reducing the risk free rate, this drop in the cost of equity implies that a virtual wall of cheap equity capital market funding currently exists – when it is known in practice that exactly the opposite applies.

Given current conditions in the financial markets described by SFG in Attachment 1, and the lack of evidence presented by IPART to justify a reduction in the Market Return Rate, the reduction in the Market Return Rate is not justified nor is it reflective of current market conditions. SFG recommend that updating the MRP to reflect current market conditions would be appropriate, in light of the lack of evidence in the market that the rate of return sought by investors has not changed from 2011. Full details of how this should be treated quantitatively are clearly articulated in Attachment 1.

Gamma (Dividend imputation factor)

In the Capital Asset Pricing Model (CAPM), the value of the imputation tax credits for investors is represented by 'gamma'. IPART describe the inclusion of gamma in the CAPM as necessary because "if investors are receiving a tax credit from their investment, they would accept an investment with a lower return that if there were no tax credits attached to this investment".[7] IPART set a gamma range of 0.3 to 0.5 in the 2010 Determination.

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[5] IPART, *Review of regulated retail tariffs and charges for electricity 2010-2013. Electricity – Final Report (March 2010)*. Page 241.

[6] The cost of equity used in the WACC is determined using the widely accepted Capital Asset Pricing Model (CAPM). The CAPM specifies that the Cost of Equity (Ke) is determined using the following formula: *Ke = Rf + B x MRP, where Rf = Risk Free rate, B = Equity Beta and MRP = Market Risk Premium = (Rm – Rf)*

[7] IPART, *Review of regulated retail tariffs and charges for electricity 2010-2013. Electricity – Final Report (March 2010)*. Page 243.

Since that time, as detailed in Attachment 1 by SFG, the Australian Competition Tribunal (ACT) has ruled that 0.25 is the most appropriate estimate of gamma given currently available information. AGL suggests that IPART should adopt the most up to date estimate of gamma, in line with other recent Australian regulatory decisions, and their own decision in relation to the Sydney Desalination Plant.[8] Again, full details on the basis for such a necessary change are outlined in Attachment 1.

Capital structure and equity beta assumptions

The capital structure assumptions (i.e. gearing) used in the WACC calculation, which is intended to reflect the ratio of debt to equity in the financial structures operated by the business in question, involves a manifest error. AGL appreciates that IPART had not planned to review the capital structure assumption this year. However, when an input assumption is so inconsistent with industry accepted practice, it should be rectified, at least for the 2012/13 decision (acknowledging that it is impractical to correct this type of error and apply it to prior years).

The Generation WACC derived by IPART assumes that:

- a power company finances the project by issuing corporate bonds;
- credit spreads for the bonds have been priced by IPART at investment-grade, that is, the bond spreads used by IPART are based on a credit rating of BBB/BBB+
- the power company has a capital structure of 50:50 bonds and equity.

These assumptions are incompatible and in particular, the latter two assumptions simply cannot co-exist in theory, or in practice.

In order for an electricity generation firm to obtain an investment grade credit rating of BBB or BBB+ from the relevant ratings agencies (i.e. Standard & Poor's, Moody's, Fitch) the key financial metric or threshold that the power company would need to meet is

- Funds From Operations (FFO) to Interest Expense (I).

Ratings agencies clearly require an FFO/I Ratio of at least 5x to provide an investment grade credit rating. Modelling of a benchmark stand-alone generator demonstrates that the feasibility of achieving a 5x FFO/I ratio is simply not possible unless unit prices are 'sustained' dramatically higher than the LRMC of the plant – which is of course an unreasonable proposition in a competitive market environment.

To provide some context, even vertically integrated merchant utilities such as Origin Energy and AGL Energy face at least a FFO/I Ratio of 5x when dealing with the ratings agencies on their respective BBB+/BBB credit ratings. Neither Origin Energy nor AGL Energy carry more than 30% debt in their capital structures, otherwise they would be in violation of one of the key metrics used in credit assessment (i.e. FFO/I at 5x or greater).

To rectify this manifest error, IPART has two corrective measures available to it:

- Retain the existing approach to issuing long-dated investment grade corporate bonds, but reduce the implied debt levels in the capital structure to reflect BBB/BBB+ credit metrics, which will have the effect of reducing debt levels down to 25-30%, or
- Switch to a Project Finance structure which could support a 50% debt level on a merchant basis, but then apply long-dated credit facilities with credit spreads of

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[8] IPART, *Review of water prices for Sydney Desalination Plant Pty Limited. From 1 July 2012. Water – Final Report (December 2011)*. Page 93.

375-450bps, rather than the current margin range reflecting investment grade bond issuance.

There is a link between the gearing level and the assumed equity beta i.e. an increase in gearing results in more prior ranking debt, increases the risk of residual equity. As noted by AGL in earlier submissions, we do not consider a consistent equity beta across the Generation and Retail WACC appropriately acknowledges the volatility of expected returns, and therefore the risk, faced by a standalone generator. In the ACIL Tasman report used to provide capital costs in this Draft Determination an equity beta of 1.75 based on a 60% debt funding level.[9]

Market-based energy purchase cost

AGL has discussed in previous submissions to IPART our concerns with the market-based approach used by Frontier Economics to calculate the energy purchase cost and so we do not propose to reproduce those arguments here.[10]

AGL has some residual of concerns related to the change in underlying assumptions used to calculate the market-based cost in the Draft Report, in particular that insufficient information has been made available for AGL to assess the impact of these assumptions on the market-based EPC. Specific concerns include:

Demand growth assumptions

IPART has used the low growth scenario from the AEMO 2011 Electricity Statement of Opportunities (ESOO). This represents a change from previous determinations in which IPART used the medium growth scenario from earlier ESOO publications. AGL has reviewed the 2011 ESOO growth scenarios and note that there appears to be fairly minor differences between the annual energy projections and maximum demand levels for the low and medium scenarios. This is reflected in the comparison of the 2012 NSW annual average price forecasts for the low and medium growthscenario in the Frontier Report (Figure 12). However, the $4-5/MWh difference in the market-based EPC for the two scenarios implies that the level of peakiness of the resulting loads for the low and medium growth scenarios is quite different. No information has been made available on the relative peakiness of these loads and therefore it is difficult for AGL to determine whether the load shapes used in the two scenarios are reasonable, and therefore whether changing the approach from using a medium scenario is appropriate.

Input assumptions to market-based model

The Frontier Report highlights that a number of input assumptions to the market-based model have changed from previous determinations and that this has driven the outcome in the Draft Report. In the absence of further details about the impact of these assumptions within the model it is difficult for AGL to comment on whether these changes are appropriate.

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[9] ACIL Tasman, *Calculation of energy costs for 2011-12 BRCI, Draft Report (16 December 2010)*. Page 21.

[10] AGL Energy Ltd., *AGL Response to the Independent Pricing and regulatory Tribunal, Changes in regulated electricity retail prices from 1 July 2011, Draft Report (13 May 2011).* Page 5.

3. Green costs

Large-scale Renewable Energy Target (LRET)

AGL supports the use of a LRMC methodology for assessing the compliance costs associated with the LRET. AGL believes this is the most appropriate methodology given retailers of scale servicing a small customer load will invariably source a significant portion of their LGCs through long term PPAs with new entrant build renewable generation.

However, as noted in previous submissions to IPART, AGL is concerned that the using an incremental multi-year LRMC approach continues be below what we would expect for the LRMC of meeting the LRET compliance requirement for a retailer.

4. IPART recommendations on retail price regulation

AGL concurs with IPART's position outlined in the following statements in section 7.4 of the Draft Report:

> *IPART continues to support the removal of price regulation in markets where competition exists. We consider that retail competition offers the best protection to customers that retail prices will not materially exceed the efficient cost of supply. While retail price regulation remains, it is important that regulators facilitate the development of the competitive market while protecting customers from abuses of market power. In particular, they should ensure that their frameworks support evolving competition.*[11]

However, IPART then considers that they should be given "a suitable degree of discretion in making the determination. AGL considers that the current approach of using energy purchase costs based on the "higher of market prices or LRMC" has been successful in fostering competition and underpinning investment in generation in NSW. Where prices are regulated, they inevitably set the 'price-to-beat'. In AGL's view, regulated prices should be set as a safety net price and using "higher of market prices or LRMC" has been highly effective in providing the basis for setting prices which balances the customers' need for price protection and the aim of promoting retail competition.

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[11] IPART, *Changes in regulated electricity retail prices from 1 July 2012. Electricity – Draft Report (April 2012)*. Page 86.

Attachment 1

The weighted-average cost of capital for electricity generation

Report for AGL

10 May 2012

SFG CONSULTING

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

PO Box 29
South Bank, QLD 4101

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

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1. Executive summary

Background and context

1. SFG Consulting (**SFG**) has been engaged by AGL to consider the approach to estimating the weighted-average cost of capital (**WACC**) for electricity generation assets that has been adopted by the Independent Pricing and Regulatory Tribunal (**the Tribunal**) in its Draft Report on Changes in regulated electricity retail prices from 1 July 2012 (**Draft Report**).

2. We note that, in its 2010 Report on Retail Electricity Pricing, the Tribunal implied that it would update only the risk-free rate and debt risk premium parameter estimates in its annual reviews. We conclude that this approach is likely to produce unreasonable estimates of WACC in the current (unusual) conditions in financial markets. We propose that either:

    a) Adjustments to some other parameters should also be made as part of this review; or

    b) The parameters that can be changed, be estimated in a manner that is more consistent with the values that are fixed for other parameters.

Summary of conclusions

3. Our primary conclusions are:

    a) Adopting a gamma value that is inconsistent with recent decisions of other regulators, and a recent decision of the Tribunal itself, can result in allocative inefficiencies. That is, the resulting regulated retail electricity price will be different from what it would have been if the Tribunal had adopted a value of gamma that was consistent with other recent regulatory decisions and with the view of the Australian Competition Tribunal.

    b) Government bond yields tend to be at historically low levels when market risk premiums are at historically high levels. If the required return on equity is estimated by adding a fixed risk premium to the current government bond yield, the implication is that equity is cheapest precisely when financial risk premiums are at their highest. The Australian Competition Tribunal has held that such an approach will not produce appropriate regulatory estimates of WACC. Consequently, either:

        i)   The estimate of risk-free rate should not be based on the current yield on government bonds; or

        ii) The estimate of market risk premium should reflect the current conditions in financial markets.

    c) In relation to current estimates of market risk premium:

        i)   Indicators of conditions in financial markets establish that risk premiums clearly remain at elevated levels (option implied volatilities, dividend yields and yield spreads in debt markets all remain well above long-run averages);

        ii) Risk premiums in financial markets have not eased to pre-GFC levels; and

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iii) If one considers a range of 4% – 8% to be appropriate for estimates of MRP, an appropriate estimate conditional on current values of option implied volatilities, debt yield spreads and dividend yields, is in excess of 7%.

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2. Effect of changes to parameter values in current review

Changes applied in current review

4. The 2012 Draft Report notes that IPART updates a subset of WACC parameter estimates during its annual review of the total energy cost allowance. Specifically, Schedule 2, Clause 3 of the 2010 Determination sets out the components to be updated as part of the annual review.[1]

5. In its current review, IPART has made changes to three parameters that affect the estimate of pre-tax real WACC:

    a)   Risk free rate (5.4% to 3.8%);

    b)   Debt margin (1.7-3.8% to 2.4-3.9%); and

    c)   Expected inflation (3% to 2.8%)

6. The impact that each of these changes has on the estimate of pre-tax real WACC is summarised in Figure 1 below.

Figure 1
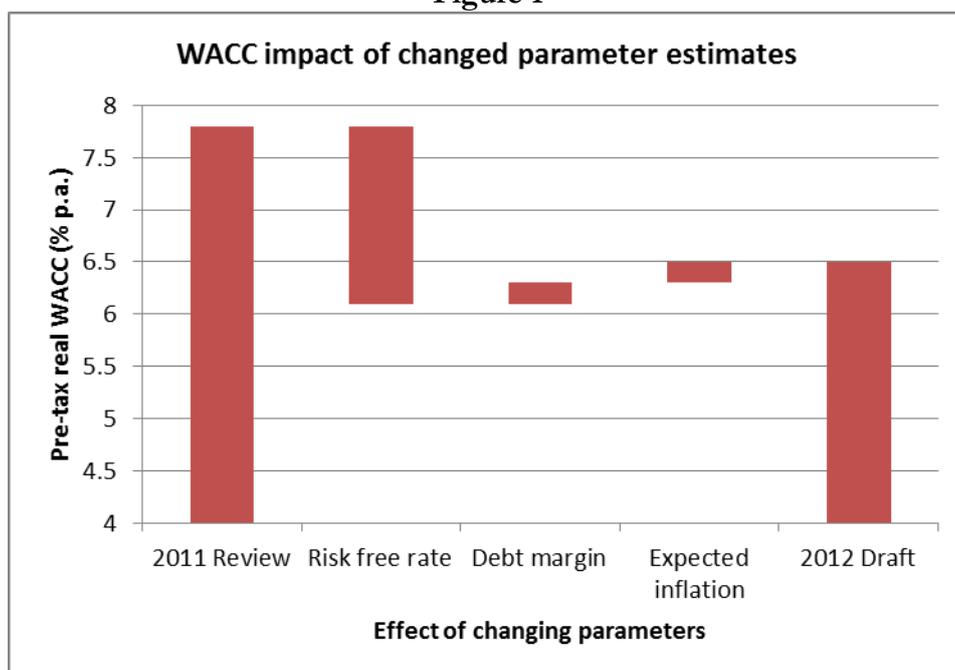
Source: Draft Report, SFG calculations.

Other changes to consider

7. In the balance of this report, we set out recommendations for changes to other WACC parameters that the Tribunal may consider as part of the current review or in its next substantive review of WACC parameters. For some parameters, we present particular reasons for considering changes to parameter values in the current review where either:

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[1] Draft Report, p. 26.

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a) It has become standard for regulators (including the Tribunal) to adopt an updated estimate of a particular parameter that is different from the estimate adopted by the Tribunal in 2010; or

b) There are multi-parameter considerations whereby a change to one parameter might imply a consequential change to another parameter.

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3. Gamma

Overview

8. In its 2010 Review, the Tribunal adopted a range of 0.3 to 0.5 for the gamma parameter. Since that time, the Australian Competition Tribunal (ACT) has ruled that 0.25 is the most appropriate estimate of gamma given the currently available information. The Tribunal's estimate of 0.25 has been adopted in every subsequent Australian regulatory decision, including IPART's recent decision in relation to the Sydney Desalination Plant.

Background and context to Tribunal review

9. Prior to the AER's last WACC Review, the long-standing regulatory precedent was to set gamma equal to 0.5, or to use a range that contained 0.5. In its WACC Review Final Decision in May 2009, the AER defined gamma to be the product of two components:

$$\gamma = F \times \theta$$

where F is the distribution ratio (the proportion of created imputation credits that are distributed to shareholders) and θ is the value of a distributed credit. Imputation credits are created whenever a firm pays a dollar of Australian corporate tax. But to distribute all of the imputation credits it creates, a firm would have to distribute 100% of its (Australian) profits as dividends. The average firm does not do this, because it retains some profits to finance future capital expenditure.

10. The AER then set gamma to 0.65. This estimate was based on:

   a) Setting F to 100%. The AER's consultant on this issue proposed that F should be set on the basis of theoretical assumption rather than market evidence; and

   b) Setting θ to 0.65 as the mid-point of two estimates:

   i)   A dividend drop-off estimate of 0.57 whereby one compares the prices of shares immediately before the ex-dividend date with the prices of the same shares immediately after, as a means of inferring the implied value of dividends and the tax credits that are attached to them[2]; and

   ii) An estimate based on ATO tax statistics about the proportion of imputation credits that are redeemed.[3]

11. The first three business to be regulated under the AER's SoRI estimate of 0.65 were ENERGEX, Ergon Energy and ETSA Utilities, all of whom sought a review by the ACT. This review took place under the National Electricity (Distribution) Rules and has become known as the *Gamma Case*.

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[2] Beggs, D.J., and C.L. Skeels, 2006. "Market arbitrage of cash dividends and franking credits," *The Economic Record,* 82 (258), 239 – 252.

[3] Handley, J.C., and K. Maheswaran, 2008. "A measure of the efficacy of the Australian imputation tax system," *The Economic Record,* 84 (264), 82 – 94.

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Issues and Tribunal findings

Estimating the distribution rate

12. The distribution rate (F) is the ratio of (a) the total amount of franking credits distributed to shareholders in a given year, to (b) the total amount of franking credits created in a given year. In the Gamma Case, the AER abandoned its contention that F should be set to 100% even before the Tribunal hearing. In its submissions to the Tribunal prior to the hearing, the AER then acknowledged that an estimate above 0.7 was unsupportable and therefore that the distribution rate should be set to 0.7. In summarising the AER's position on this issue, the Tribunal stated that:

> The AER accepts that on the material presently before the Tribunal, there is no empirical data that is capable of supporting an estimated distribution ratio higher than 0.7. The AER therefore accepts that it is open to the Tribunal to adopt a substitute distribution ratio of 0.7.[4]

13. The Tribunal then concluded and ordered that:

> In light of these submissions and the material before the Tribunal, the Tribunal concludes that the distribution ratio is 0.7 for the calculation of gamma.[5]

Estimating Theta

14. Having made a determination in relation to the distribution rate, the Tribunal then turned to the estimation of the other component of gamma, the value of distributed credits, theta. In particular, the theta parameter estimates the value, to the relevant shareholder, of a dollar of franking credits that has been distributed to them. Different shareholders will place a different value on the franking credits that are distributed to them. Resident shareholders can use franking credits to reduce their personal tax obligations, whereas non-resident shareholders obtain no benefit from franking credits. Theta represents the extent to which trading among all market participants results in some value in relation to franking credits being impounded into the stock price.

15. Two techniques for empirically estimating theta were considered by the Tribunal:

    a) Tax statistics about the proportion of distributed imputation tax credits that had been redeemed by shareholders, obtained from the Australian Taxation Office; and

    b) Dividend drop-off analysis, whereby the implied value of imputation tax credits is inferred from the price change that occurs over ex-dividend days.

16. The Tribunal held that the ATO tax statistics did not represent an estimate of market value and that the AER was wrong to have used them for that purpose.

17. This left the Tribunal with dividend drop-off analysis. On this point, the AER had sought to rely entirely on a single study by Beggs and Skeels (2006). The Tribunal held that the AER was wrong to rely on an out-dated and methodologically unsound dividend drop-off study. The Tribunal then

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[4] Australian Competition Tribunal [2010] ACompT 9, Paragraph 2.
[5] Australian Competition Tribunal [2010] ACompT 9, Paragraph 4.

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directed that SFG should conduct a "state-of-the-art" dividend drop-off study to assist the Tribunal.[6] The Tribunal also directed that the dividend drop-off study to be performed by SFG "should employ the approach that is agreed upon by SFG and the AER as best in the circumstances."[7]

18. After a number of meetings and telephone conferences and circulation of several draft versions of proposed Terms of Reference, agreement on several matters could not be reached. This required a further hearing before the Tribunal on those matters that were in dispute. At the completion of this hearing, the Tribunal made an immediate ruling, finding against the AER on all issues.

19. SFG then conducted the state-of-the-art dividend drop-off study and circulated a draft report to all parties. The AER and the regulated businesses provided comments on the draft report and these were taken into account in a revised report that was provided to all parties and to the Tribunal.

20. At the final hearing, the AER submitted that the SFG study had departed from the Terms of Reference, could be criticised on numerous other grounds, and should therefore be afforded little weight. The Tribunal rejected these submissions entirely concluding that:

> It is not necessary to set out the details of the eight issues, since they raise no important or significant questions of principle…Calling them "major compliance issues" is unnecessarily pejorative.
>
> Whether or not the terms of reference have been departed from, what is important is whether the concerns raised by the AER with the construction of the database cast doubt on the value of SFG's analysis, requiring the Tribunal to give it less weight than it otherwise would. In the Tribunal's view, they do not.
>
> The Tribunal is satisfied that the procedures used to select and filter the data were appropriate and do not give rise to any significant bias in the results obtained from the analysis. Nor was that suggested by the AER.[8]

21. The Tribunal then accepted the estimates from the SFG state-of-the-art study:

> In respect of the model specification and estimation procedure, the Tribunal is persuaded by SFG's reasoning in reaching its conclusions. Indeed, the careful scrutiny to which SFG's report has been subjected, and SFG's comprehensive response, gives the Tribunal confidence in those conclusions. [9]

22. The Tribunal went on to conclude that:

> The Tribunal is satisfied that SFG's March 2011 report is the best dividend drop-off study currently available for the purpose of estimating gamma in terms of the Rules.[10]

and

> The Tribunal finds itself in a position where it has one estimate of theta before it (the SFG's March 2011 report value of 0.35) in which it has confidence, given the dividend

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[6] Australian Competition Tribunal [2010] ACompT 7, Paragraph 146.
[7] Australian Competition Tribunal [2010] ACompT 7, Paragraph 147.
[8] Australian Competition Tribunal [2011] ACompT 9, Paragraphs 18-19.
[9] Australian Competition Tribunal [2011] ACompT 9, Paragraph 22.
[10] Australian Competition Tribunal [2011] ACompT 9, Paragraph 29.

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> drop-off methodology. No other dividend drop-off study estimate has any claims to be given weight vis-à-vis the SFG report value.[11]

Final estimate of Gamma

23. Having determined that the appropriate distribution rate is 70% and that the best dividend drop-off estimate of theta is 0.35, the Tribunal had no more work to do other than to multiply these two estimates together to obtain a gamma estimate of 0.25:

> Taking the values of the distribution ratio and of theta that the tribunal has concluded should be used, viz 0.7 and 0.35, respectively, the Tribunal determines that the value of gamma is 0.25.[12]

Implications

24. As noted above, in its 2010 Review, the Tribunal adopted a range of 0.3 to 0.5 for the gamma parameter. Since that time, the Australian Competition Tribunal (**ACT**) has ruled that 0.25 is the most appropriate estimate of gamma given the currently available information. The Tribunal's estimate of 0.25 has been adopted in every subsequent Australian regulatory decision, including IPART's recent decision in relation to the Sydney Desalination Plant.

25. Adopting a gamma value that is inconsistent with recent decisions of other regulators, and a recent decision of the Tribunal itself, can result in allocative inefficiencies. That is, the resulting regulated retail electricity price will be different from what it would have been if the Tribunal had adopted a value of gamma that was consistent with other recent regulatory decisions and with the view of the Australian Competition Tribunal.

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[11] Australian Competition Tribunal [2011] ACompT 9, Paragraph 38.
[12] Australian Competition Tribunal [2011] ACompT 9, Paragraph 42.

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4. Risk-free rate and market risk premium

Government bond yields at historical lows

26. The Draft Decision adopts an estimate of the risk-free rate that is based on a 20-day average of the yield on 10-year Commonwealth Government bonds. In recent times, the yield on 10-year government bonds has been at historical lows. Figure 2 below shows the time series of 20-day moving average of the yield on 10-year Commonwealth Government bonds.
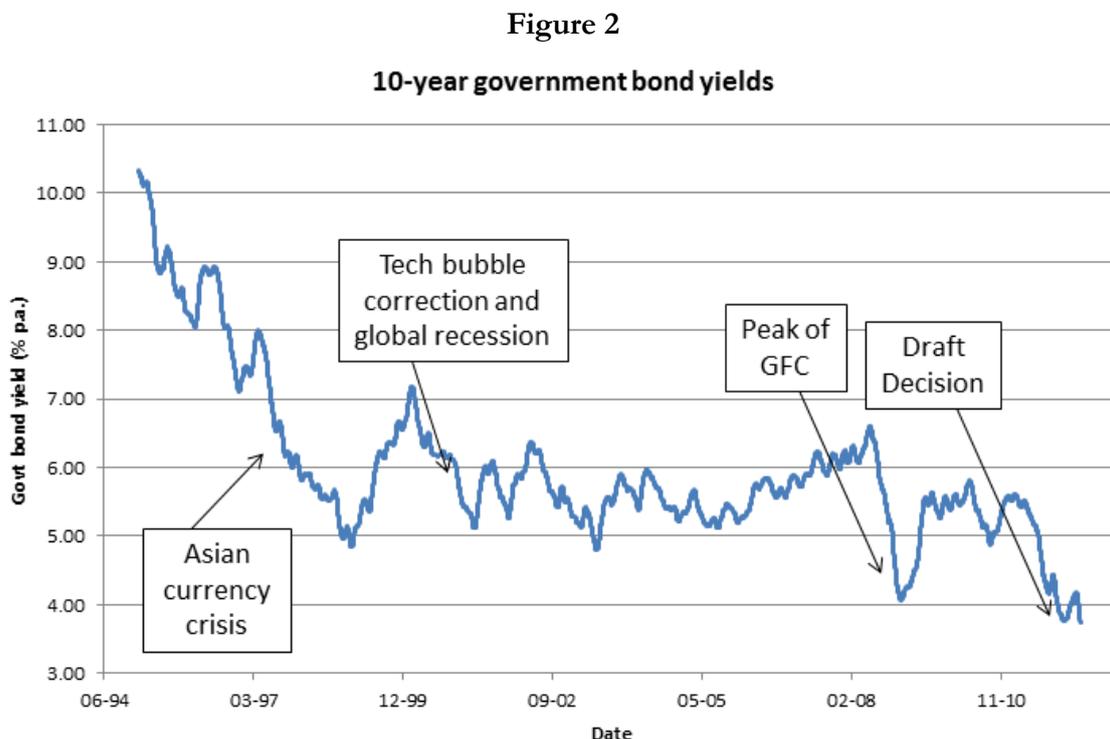
Figure 2

Source: Reserve Bank of Australia.

27. It is clear in Figure 2 that the yield on 10-year Commonwealth Government bonds was at, or close to its historical low over the last 15 years at the time of the Draft Decision and remains at that historically low level today.

The relationship between government bond yields and financial risk premiums

28. 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.

29. 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 2 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.

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30. 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. Recent election results in France and Greece have further heightened risk premiums, sending stock markets sharply lower and government bond yields to their lowest ever levels.

31. Queensland Treasury Corporation have also examined the relationship between 10-year Commonwealth Government bond yields and risk premiums in financial markets. Figure 3 below shows the relationship between 10-year government bond yields and estimates of the 10-year debt risk premium. That figure shows that debt risk premiums are heightened when government bond yields are very low. That is, at times when investors are requiring high premiums for bearing risk, government bond yields tend to be very low – consistent with a flight-to-quality effect.

Figure 3
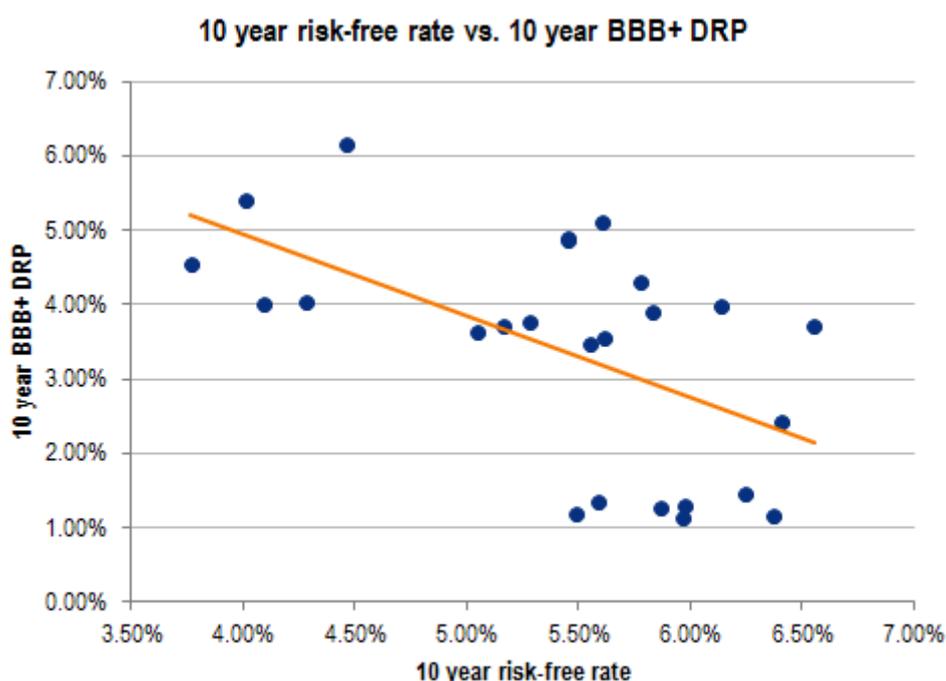
Source: Queensland Treasury Corporation.

Application of the CAPM

32. The Draft Decision estimates the required return on equity using the Capital Asset Pricing Model:

$$r_e = r_f + \beta_e \times MRP.$$

33. The beta and market risk premium parameters are effectively fixed for a period, and historically only the estimate of the risk-free rate that is updated in the annual reviews. Consequently, the required return on equity has been estimated by adding a fixed premium (currently 6%) to the estimate of the risk-free rate at the time of the annual review.

34. The design of this approach is likely to have contemplated periods of market stability, when government bond yields are stable and close to their long-run average level. However, during

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extreme periods, when government bond yields are lower than they have ever been, estimating the required return on equity by adding a fixed margin to government bond yields will produce nonsensical outcomes. In particular, that approach implies that the required return on equity is low when government bond yields are low – that the cheapest equity finance ever available was at the peak of the GFC and at the current time. This is because fixing the estimate of MRP prevents the Tribunal from recognising that government bond yields, now and at the peak of the GFC, were at historical lows precisely because risk premiums are at historical highs.

Regulatory precedent

35. The relationship between government bond yields and market risk premium has been addressed by the Australian Competition Tribunal in the TransGrid Case.[13] The relevant facts of that case are almost identical to the present case. TransGrid was regulated under Chapter 6A of the National Electricity Rules, which required the risk-free rate to be estimated using appropriate market data, whereas estimates of beta and market risk premium were fixed.

36. 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.

37. Because the Rules required a fixed long-run average estimate of MRP to be used, TransGrid proposed to use a long-run average estimate of the risk-free rate – so that the two parameters were estimated consistently in order to produce a sensible estimate of the required return on equity. The Australian Energy Regulator 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.

38. The Australian Competition 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.[14]

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.

39. The Australian Competition Tribunal allowed TransGrid to use an estimate of the risk-free rate that was closer to the long-run average, to be consistent with the long-run average estimate of MRP that was required under the Rules.

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[13] [2009] ACompT 8.
[14] [2009] ACompT 8, Paragraph 112.

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Implications for the current decision

40. The Draft Decision is based on a fixed estimate of 6% for MRP. This is a long-run average estimate of MRP. If this estimate cannot be changed for the current annual review, mixing a long-run average estimate of MRP with the current lowest-on-record government bond yield, would be "unlikely to produce a rate of return appropriate for the regulatory period." Rather, a long-run average estimate of risk-free rate together with a long-run average estimate of market risk premium is likely to produce a more sensible estimate of the required return on equity.[15]

41. The average yield on 10-year Commonwealth Government bonds from 1995 to the present (graphed in Figure 2 above) is 6.00%. Consequently, conditional on maintaining the long-run average 6% estimate of MRP, the Tribunal might consider two alternative approaches for adopting an estimate of the risk-free rate that is likely to produce more reasonable estimates of the required return on equity:

    a) Adopting a long-run average risk-free rate of 6%; or

    b) Maintaining the current estimate of the risk-free rate (from the decision for the 2011-12 period) of 5.4%.

42. An alternative approach would be to update the estimate of MRP to reflect current market conditions, as set out in the following section of this report.

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[15] In our view, this is still not a best estimate, but under the constraint of having to apply the fixed estimate of MRP, it will produce a more sensible estimate than that produced by using current government bond yields.

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5. Current conditions in financial markets

Do risk premiums in financial markets remain at elevated levels?

43. To determine whether financial market risk premiums remain at elevated levels, the standard approach is to examine a time series of variables that have been shown in the finance literature to be related to market risk premiums. The variables that are examined include the level of government bond yields, as set out above, and:

   a) Option implied volatilities – higher implied volatilities indicate higher levels of market risk and consequently higher risk premiums;

   b) The spread between the yields on highly-rated bonds and lower-rated bonds – a greater spread indicates that risk premiums are high in financial markets generally; and

   c) Dividend yields – a higher dividend yield indicates that prices are low relative to dividends, which is consistent with dividends being discounted back to present value using a higher discount rate, which is in turn consistent with higher risk premiums.

44. Fama and French (1988), Fama and French (1989) and Keim and Stambaugh (1986) demonstrate that dividend yields and default spreads are positively associated with future equity market returns relative to Treasury bill rates. This does not imply that equity market returns can be forecast with absolute precision or that these variables provide investors with a trading strategy which generates abnormally high returns. What the academic research shows is that the bond and equity market prices appear to be affected by similar risk considerations. This means that low equity prices (relative to trailing dividends) and low corporate bond prices (relative to promised repayments) reflect investors' expectations for risk and therefore their required return for bearing that risk, in both the equity and debt markets.

45. In the remainder of this section, we examine a time series of each of these variables in turn.

Option implied volatilities

46. In the Australian market, it is most common to estimate the implied volatility of the broad market using options on the ASX 200 index. These implied volatilities are computed by determining the volatility estimate that would have to be inserted into the Black-Scholes option pricing formula in order to reconcile the model price with actual traded market prices.[16] Prices for relatively short-term at-the-money call and put options are usually used for this purpose.

47. This series measures the market's perception of the forward-looking volatility of the ASX 200 index. It is therefore a measure of the *amount* of risk that market participants perceive. This is not a perfect measure of the Capital Asset Pricing Model (**CAPM**) MRP for two reasons:

   a) It is based on options with a relatively short (3 month) time horizon[17]; and

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[16] The Black-Scholes model is the industry standard model for valuing stock options. The framework was developed by Fisher Black, Myron Scholes and Robert Merton. Scholes and Merton were awarded the Nobel Prize in Economics in relation to this work in 1997 (Black died in 1995 and the Nobel Prize is not awarded posthumously).

[17] Officer and Bishop (2009) have also examined the implied volatility of 12-month options on the S&P/ASX 200 index. However, there is less historical data available for 12-month options than for shorter-dated instruments (one month and three month options).

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b) It reflects only the *amount* of risk, whereas the CAPM MRP also reflects the *price* of risk – the return that investors require for bearing each unit of risk. Both of these components, and hence the MRP, can vary over time.

48. It is clear and well-accepted that there is a positive relationship between implied volatilities and the forward-looking MRP. Higher implied volatilities are indicative of higher risk and consequently higher risk premiums. That is, when implied volatilities are materially above their long-run average level, risk premiums will also be above their long-run average levels.

49. Since implied volatilities provide an indication of the market's view about volatility over the life of the option, they provide a forward-looking view of stock market volatility. This is relevant to the estimation of MRP in that volatility is a measure of the *quantity* of risk that is associated with an equity investment – a greater amount of risk would logically require a greater premium as compensation for bearing it.

50. Although it is difficult to precisely quantify this relationship, the directional effect is well accepted.

51. Figure 4 below contains data from the beginning of 2000 to the end of January 2012. In recent times the implied volatility from option prices is higher than its average value, even where that average has been computed over the period that contains the material period of extreme values associated with the GFC. This is consistent with the proposition that the effects of the GFC have not completely washed through the system, that risk premiums remain at elevated levels, and that an MRP estimate above the long-run average estimate of 6% would be appropriate in the current circumstances. In particular, the most recent observation of implied volatility is 18.66%, which is greater than 62% of the observations since 1 January 2000. If data from the GFC period (post July 2007) is omitted from the sample, the current value of implied volatility is more than 1.2 standard deviations above the mean and is greater than 88% of the observations in the sample. We report these ex-GFC results, as the use of the full sample involves an implicit assumption that a GFC-like event occurs once every decade.

Figure 4. Option implied volatility
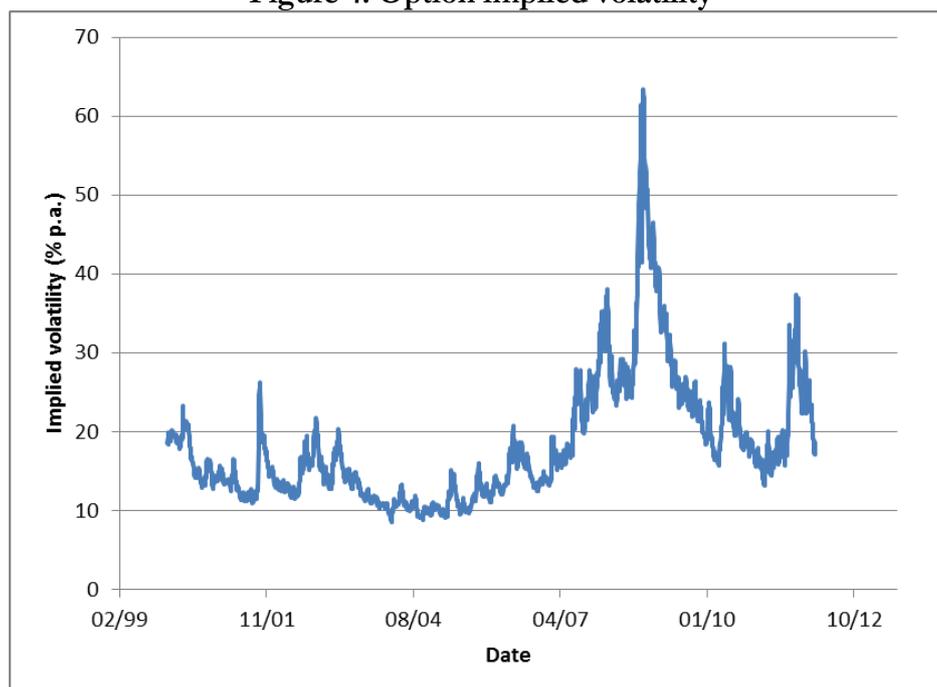
Source: Citibank ASX 200 implied volatility series, Bloomberg

Yield spreads in debt markets

52. The *default spread* is measured as the difference between an index of the yield to maturity on BBB-rated bonds and a corresponding index of AAA-rated bonds. This spread proxies for credit or default risk. During economic expansions, the spread between the yields on higher- and lower-rated bonds tends to be low as risk premiums are also low. During recessions, however, the spread widens, commensurate with an increase in risk premiums generally.[18]

53. Figure 5 below plots the spread between the DataStream AAA and BBB yield estimates. This figure is based on redemption yields for Australian corporate bonds with approximately 3-years to maturity supplied by Merrill Lynch Bank of America. It is based on data from the beginning of 2001 to the end of January 2012. This figure shows that risk premiums in debt markets have reduced since the peak of the GFC, but remain at levels much higher than before the GFC. In particular, the most recent observation of the yield spread is 3.755%, which is greater than 95% of the observations and more than 1.94 standard deviations above the mean since 1 January 2001. If data from the GFC period (post July 2007) is omitted from the sample, the current value of the yield spread is more than 22 standard deviations above the mean and is greater than all of the observations in the sample. As noted above, we report these ex-GFC results, as the use of the full sample involves an implicit assumption that a GFC-like event occurs once every decade.

54. In my view, this is evidence supporting the proposition that risk premiums in equity markets are also likely to remain at elevated levels and not to have reduced to pre-GFC levels. In particular, it would be highly unlikely that investors would currently require materially higher than average risk premiums when investing in a firm's bonds, but not when investing in the same firms' shares.

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[18] See, for example, Fama and French (1988), Fama and French (1989) and Keim and Stambaugh (1986).

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**Figure 5. Spread between AAA and BBB bonds**
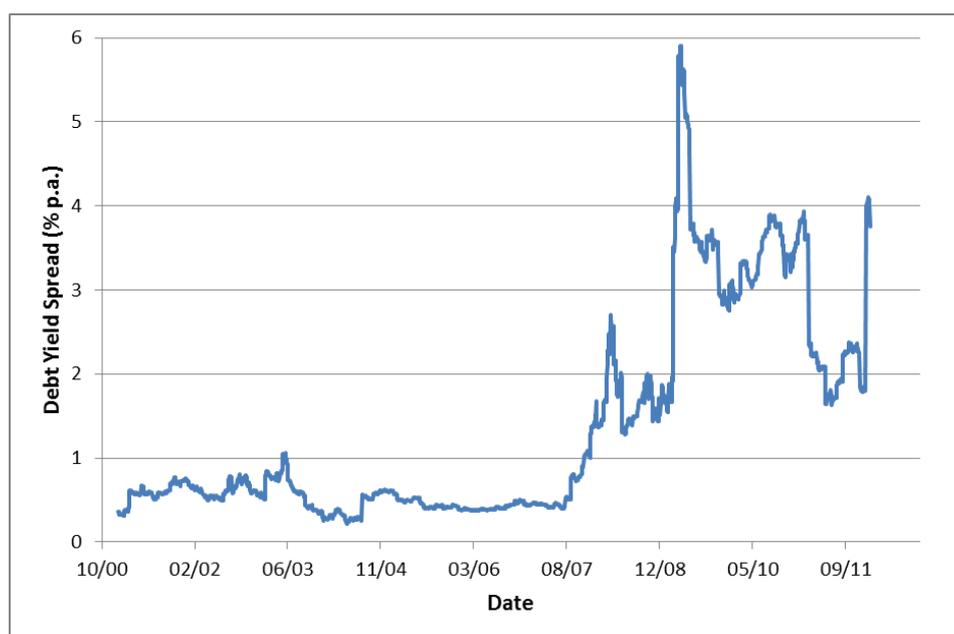
Source: Datastream

Dividend yields

55. The dividend yield is the ratio of the cash flow to shareholders by way of dividends (including payments of a return of capital and payments in relation to loan notes) to the price of the stock. When dividend yields are high, a given set of cash flows is being discounted at a higher rate, indicative of higher equity risk premiums.[19]

56. Figure 6 shows a time series of dividend yields from the beginning of January 2000 to the end of January 2012. There was a clear and dramatic increase in dividend yields during the height of the GFC. Yields have since fallen, but remain above the pre-GFC levels. The current dividend yield is 4.69%, which is larger than 87% of the observations and more than 1.02 standard deviations above the mean since 1 January 2000. If data from the GFC period (post July 2007) is omitted from the sample, the current value of the dividend yield is more than 3.3 standard deviations above the mean and is greater than all of the observations in the sample. As noted above, we report these ex-GFC results, as the use of the full sample involves an implicit assumption that a GFC-like event occurs once every decade.

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[19] See, for example, Fama and French (1988), Fama and French (1989) and Keim and Stambaugh (1986).

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Figure 6. Dividend yield on ASX 200 index
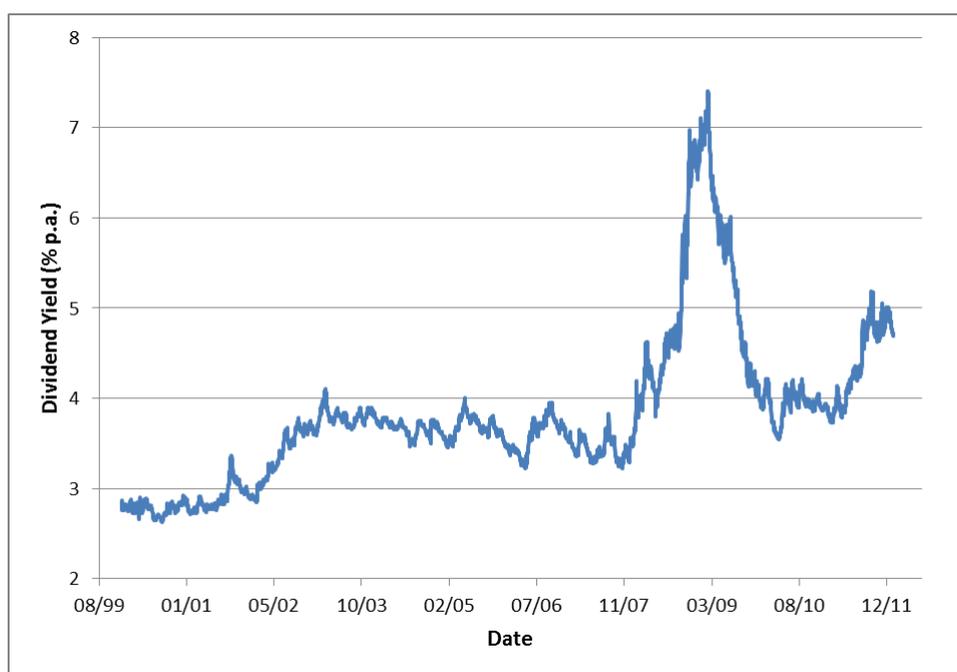
Source: Datastream

57. Many papers in the empirical finance literature (including Fama and French, 1988; Fama and French, 1989; and Keim and Stambaugh, 1986) demonstrate that dividend yields are strongly correlated with future excess stock returns. Consequently, the fact that dividend yields are currently at historically high levels indicates that market risk premiums remain at elevated levels.

Summary of empirical evidence

58. The conclusions that can be drawn from the analysis set out above are:

    a) The GFC had a pronounced effect on market risk premiums during the height of the crisis;

    b) All indicators suggest that this effect has diminished since the peak of the GFC; and

    c) These indicators remain materially above their pre-GFC levels.

59. In our view, the available financial market data supports the conclusion that the effects of the GFC have reduced, but they continue to affect risk premiums in financial markets. The available financial market data does not support the conclusion that investors view the amount of risk involved in holding a broad portfolio of equities and the price of risk (the additional return that is required in relation to each unit of risk) as now being the same as before the GFC. In our view, the turmoil in financial markets surrounding the GFC continues to have a clear effect on risk premiums in financial markets.

Effect on estimate of MRP

60. This section demonstrates how the information from relevant conditioning variables might be used to select a point estimate for the conditional MRP – one that is consistent with the prevailing conditions in the market for funds. That is, the conditioning variables are used in selecting an

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estimate of MRP because they have been shown to be informative about the prevailing conditions in the market.

61. At a simple level, the approach is as follows:

   a) We select a range for the regulatory estimate of MRP. We interpret this as a range of the conditional mean estimates that a particular regulator might adopt from time to time. The mid-point is interpreted as a regulatory estimate of the unconditional mean, and the range is interpreted as consisting of a standard 95% confidence interval around this mid-point;

   b) We note that the current values of the conditioning variables are (on average) more than one standard deviation above their long-run means; and

   c) We therefore conclude that the conditional mean estimate that is consistent with the prevailing conditions in the market (as measured by the relative values of the conditioning variables) is also more than one standard deviation above *its* mean.

Conditional MRP estimate

62. As set out above, the empirical finance literature notes that a number of variables are strongly predictive of future excess returns. Consequently, the best estimate of future excess returns is one that is conditional on these predictive variables. That is, we may be able to use these variables to determine the circumstances in which it would be appropriate to adopt an estimate of MRP above (or below) the long-run average unconditional estimate, which regulatory precedent sets to 6%.

63. The use of CAPM parameter estimates that are conditional on the relevant information that is available at the time (i.e., conditional on the prevailing conditions in the market for funds) is consistent with the framework adopted by regulators. For example, 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.[20]

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).[21]

64. 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.[22]

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[20] Davis (2011, p. 9).
[21] Davis (2011, p. 11).
[22] Envestra Final Decision, p. 41.

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65. Within this framework, there is a long-run unconditional mean estimate of MRP (which is 6% under regulatory precedent) and a conditional mean estimate that varies above and below the long-run mean 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.

66. To date, the AER and other regulators have adopted an *implicit* conditional CAPM approach. In this report, we describe a simple approach for explicitly selecting an estimate of the conditional MRP from within a range – a point is selected from within a range according to the current values of the conditioning variables relative to their average values. If the conditioning variables are currently above their average levels, this would indicate that the conditional MRP (that is commensurate with current conditions) is proportionately above its average level, and vice versa.

Range of MRP estimates

67. By way of illustrating this approach, we consider a range of regulatory MRP estimates of 4% – 8%. We have selected the mid-point of this range to coincide with the regulatory unconditional mean estimate of 6%. The width of the range is interpreted as a 95% confidence interval for the conditional MRP.

68. A number of different techniques (such as regime-switching models and dividend growth models, for example) can be used to provide information about the range of conditional MRP estimates. A regulator may have regard to a range of econometric techniques and other considerations in determining the range of conditional MRP estimates that it may adopt from time to time. In this report we consider the case where the regulator has adopted a range of 4% – 8% in order to illustrate how information from the conditioning variables can be used.

Application to current conditions in the market for funds

69. Table 1 below shows the current values of the three conditioning variables, relative to their long-run means. All three variables are well above their long-run means and take current values that are higher than the vast majority of post-2000 observations. This is clear evidence that risk premiums in financial markets are currently at elevated levels.

Table 1. Current and relative value of MRP conditioning variables

Conditioning variable	Mean since 2000	Current observation	Percentile rank of current observation	Number of standard deviations above mean
Option implied volatility	18.29%	18.66%	62%	0.05
(Omitting GFC period)	13.90%	18.66%	88%	1.22
Debt yield spread	1.35%	3.76%	95%	1.95
(Omitting GFC period)	0.51%	3.76%	>100%	22
Dividend yield	3.82%	4.69%	88%	1.02
(Omitting GFC period)	13.90%	3.39%	>100%	3.30

Source: Datastream, Bloomberg, SFG calculations.
Implied volatility figures are from the beginning of January 2000 to the end of January 2012.
Debt yield spread figures are from the beginning of January 2001 to the end of January 2012.
Dividend yield figures are from the beginning of January 2000 to the end of January 2012.

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70. Next, we note that the current values of the three conditioning variables are, on average, more than one standard deviation above their means (and materially more than this if the GFC period is omitted from the sample). That is, Table 1 suggests that it would be conservative to conclude that the current levels of the conditioning variables are, on average, more than one standard deviation above their long-run usual levels.

71. Finally, recall that the regulatory range of 4% – 8% is interpreted as a 95% confidence interval – with two standard errors above and below the regulatory mid-point estimate of 6%. Consequently, since the conditioning variables are more than one standard deviation above their means, we consider an estimate of the conditional mean MRP that is also more than one standard deviation above its mean. This yields a current point estimate of the conditional MRP in excess of 7%.

Final conclusions

72. Our main conclusions are:

   a) Indicators of conditions in financial markets establish that risk premiums clearly remain at elevated levels (option implied volatilities, dividend yields and yield spreads in debt markets all remain well above long-run averages);

   b) Risk premiums in financial markets have not eased to pre-GFC levels; and

   c) For the reasons set out above, if one considers a range of 4% – 8% to be appropriate for estimates of MRP, an appropriate estimate conditional on current values of option implied volatilities, debt yield spreads and dividend yields, is in excess of 7%.

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