Market evidence on the cost of equity

Aurizon Network Pty Ltd

22 November 2016

Building a better working world

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1. Executive summary

EY was engaged by Aurizon to undertake an empirical analysis of the application of the Capital Asset Pricing Model (CAPM) by independent experts in their estimation of the cost of equity.

The approach used by independent experts is of interest because the CAPM, which is widely used as a tool to estimate the unobservable required cost of equity, can be applied in different ways using different underlying assumptions with respect to its component parameters. The approach used by independent experts can therefore inform the way in which financial theory, market data, market knowledge and other information is considered in forming a view on the CAPM cost of equity.

Independent experts estimate the cost of equity for the purpose of valuing certain businesses and investment opportunities (transactions). An expert report sets out the expert's opinion on whether a proposed transaction is 'fair and reasonable' and/or 'in the best interests' of affected shareholders. The circumstances under which there is a requirement to prepare an independent expert report is set out in the Corporations Act and the Australian Securities Exchange (ASX) Listing Rules.

Independent expert reports are prepared by qualified and accredited independent experts, working within an explicit regime of regulation, comprising both formal statutory rules and less formal guidelines, which require that the expert be accountable for the results of their work. They therefore face strong incentives to produce analysis that is informed and accurate.

This report sets out the findings from an empirical analysis of the application of the CAPM by independent experts in their estimation of the cost of equity.

1.1 Key findings

To assess the prevailing cost of equity in the Australian market for funds, we have undertaken a review and analysis of independent expert reports. Those reports provide the best publicly available market evidence to assess the prevailing cost of equity in the Australian market for funds.

The data which underpins this review covers 1,608 independent expert reports dated between 1 January 2008 and 31 December 2015 and published in the CONNECT 4 Expert Reports database. This timeframe was selected to provide a longer term perspective of how experts estimate the cost of equity and to capture any trends in the way independent experts estimate the cost of equity. Of the 1,608 independent expert reports, 201 reports qualified for more detailed analysis to assess how the forward-looking cost of equity is estimated and applied to derive the discounted value of the expected future cash flows.

The market relies on independent expert reports to inform decisions about actual transactions, with 58% of the independent expert reports we reviewed relating to successful takeovers.[1]

In assessing the prevailing cost of equity in the Australian market for funds, we have focused on the market cost of equity (i.e. those components of the CAPM that are influenced by market-wide factors; namely, the risk free rate and market risk premium), as defined in Section 4.

Based on our review:

- Independent experts do not subscribe to a mechanistic approach in their application of the CAPM to estimate the cost of equity and, at least since the onset of the Global Financial Crisis

[1] Of the 201 reports reviewed as part of this work, 116 (or 58%) related to takeovers which were identified as successful in the CONNECT 4 Expert Reports database.

(GFC), have made adjustments to the calculated weighted average cost of capital or cost of equity to arrive at the discount rate they apply

- The way these adjustments are applied tends to differ between independent experts, but each independent expert tends to adopt the same approach to adjusting the calculated weighted average cost of capital or cost of equity over time. Refer to Section 6.3 for more evidence
- For example, in 2015, we observed that 23 of the 24 independent expert reports that qualified for our review made adjustments. This was done by either using longer term averages of the government bond yield for the risk free rate as opposed to a short term spot values, increasing the overall inputs-based CAPM cost of equity or discount rate applied based on wider market considerations or applying company or project specific risk premia
- The more mechanistic approach that is used typically by economic regulators, such as the Queensland Competition Authority (QCA), yields estimates of the market cost of equity that are below those estimated by independent experts, and in many cases, materially so
- It is not obvious why such a discrepancy should exist between the views of economic regulators and those of independent experts in respect of the cost of equity, as both are seeking to estimate a cost of equity at a point in time that reflects the requirements of investors. To the extent that economic regulators are providing a lower cost of equity than that estimated by independent experts, and the latter provides a more accurate reflection of investors' requirements, then it can be expected to have a detrimental impact on investment.

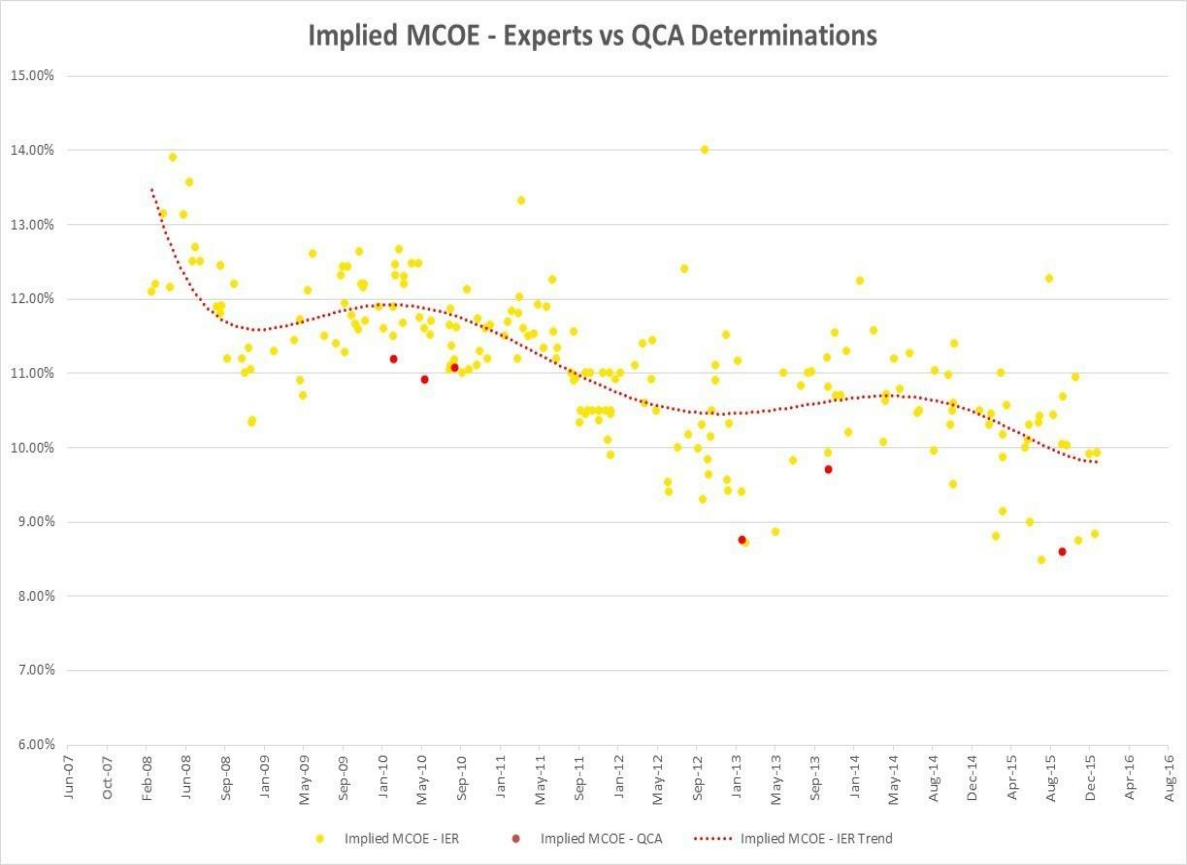
Between 2008 and 2015:

- The average market cost of equity implied by the 201 independent expert reports is 11.10%
- As a comparison, we have recalculated the market cost of equity on the date that each of the 201 independent expert reports was produced using the approach adopted by the QCA in its regulatory determinations. Based on this approach, the average market cost of equity implied by the QCA between 2008 and 2015 is 9.99%
- The average difference is over 100 basis points and much higher if imputation credits are included
- The discrepancy between the independent expert market cost of equity and the QCA market cost of equity has generally increased over the period of the analysis, as Section 6.2 illustrates (i.e. it was 187 basis points in 2015). The factor driving this increase has been the historically low risk free rates of interest that have emerged in the last few years and the differences in how this has been treated by the QCA and independent experts in setting the cost of equity.

This discrepancy is shown in the following figure which shows that the QCA's implied market costs of equity lie well below the trend line and the bottom end of the range implied by the contemporaneous independent expert reports.[2]

[2] This is prior to the consideration of imputation credits, which is discussed in Section 6.4, and which have the effect of expanding the difference between the implied market cost of equity of independent experts and of the QCA.

Figure 1: Implied Market Cost of Equity



Source: EY analysis

The table below illustrates the increasing difference between the independent expert and QCA implied market cost of equity on an annual basis.

Table 1: Summary of Implied MCOE

Year	Expert Implied market cost of equity (A)	QCA Implied market cost of equity (B)	Difference (A – B)
2008	12.05%	11.49%	0.55%
2009	11.82%	10.76%	1.06%
2010	11.71%	10.97%	0.74%
2011	11.13%	10.27%	0.86%
2012	10.59%	8.83%	1.76%
2013	10.48%	8.99%	1.47%
2014	10.76%	8.93%	1.83%
2015	10.10%	8.24%	1.87%
2008 – 2015	11.10%	9.89%	1.20%

2. Introduction

2.1 Background

The relationship between the market risk premium ("MRP") and the risk free rate has received increasing attention in the literature on economic regulation in recent years. The long lasting effects of the GFC of 2008 and the subsequent debt crisis, which saw investors switch into safe-haven liquid assets, led many governments around the world to stimulate capital markets through quantitative easing ("QE") programmes.[3] QE has had the effect of lowering the yields on government securities. In some countries, successive rounds of QE have resulted in government bond yields falling into negative territory.

The fall in government bond yields has been problematic for businesses that are subject to economic regulation. It is common practice for regulators to set regulated prices or revenues based on an allowed cost of equity that is estimated using the CAPM. However, standard regulatory practice often involves estimating the CAPM cost of equity using a fixed value for the MRP (commonly set by reference to, or with a heavy reliance on, historical average measures of the MRP) and to set the value of the risk free rate by reference to prevailing market yields on long term government bonds.

This approach has been used by a number of Australian regulators in the past, including the QCA in the past. In the post-GFC environment, this has had the effect of reducing the allowed cost of equity, and hence required revenues, of regulated businesses.

The approach taken by regulators has sparked significant debate in Australian regulatory determinations, with regulated businesses arguing that their cost of equity has not been trending down in the way reflected in regulatory determinations. The MRP is influenced, at least partially, by current and forecast conditions in capital markets and can be viewed as a measure of investors' appetite or tolerance for risk.

Prevailing market conditions that are characterised by persistently low interest rates brought about by efforts to stimulate economies and increase consumer and investor confidence are therefore also likely to be accompanied by higher levels of risk aversion.[4]

2.2 Scope of work

EY was engaged by Aurizon to undertake an empirical analysis of the application of the CAPM by independent experts in their estimation of the cost of equity.

Their approach is of interest because the CAPM, which is widely used as a tool to estimate the unobservable required cost of equity, can be applied in different ways using different underlying assumptions with respect to its component parameters. The approach used by independent experts can therefore inform the way in which financial theory, market data, market knowledge and other information is considered in forming a view on the CAPM cost of equity.

Independent experts estimate the cost of equity for the purpose of valuing certain businesses and investment opportunities (transactions). An expert report sets out the expert's opinion on whether a proposed transaction is 'fair and reasonable' and/or 'in the best interests' of affected shareholders. The circumstances under which there is a requirement to prepare an independent

[3] The Bank of England describes quantitative easing as a policy of expanding the central bank's balance sheet through asset purchases, financed by central bank money.

[4] For example, Grant Samuel stated in its assessment of the proposed acquisition of SKILLED Group that "global interest rates, including long term bond rates, are at very low levels by comparison with historical norms reflecting the liquidity being pumped into many advanced economies to stimulate economic activity. Effective interest rates are now low, if not negative in some jurisdictions. Grant Samuel does not believe this position is sustainable and the risk is clearly towards a rise in bond yields" and that the interest rates used to calculate the discount rate should recognise this. This approach has been consistently adopted by Grant Samuel since at least 2012. Refer to Section 6.3.2 for more details.

expert report is set out in the Corporations Act and the Australian Securities Exchange ("ASX") Listing Rules.

Independent expert reports are prepared by qualified and accredited independent experts, working within an explicit regime of regulation, comprising both formal statutory rules and less formal guidelines, which require that the expert be accountable for the results of their work. They therefore face strong incentives to produce analysis that is informed and accurate.

This report sets out the findings from an empirical analysis of the application of the CAPM by independent experts in their estimation of the cost of equity.

2.2.1 Our approach

To assess the prevailing cost of equity in the Australian market for funds, we:

- Reviewed all independent expert reports from the CONNECT 4 Expert Reports database issued between 1 January 2008 and 31 December 2015
- Identified those reports that included a discount rate for valuation purposes and that applied the CAPM to estimate the cost of equity
- Analysed the independent expert's approach to estimating the discount rate in these reports and assessed whether they adjusted the calculated WACC to arrive at the discount rate applied to the transaction.

This is discussed further in Section 5 of this report.

2.2.2 Disclaimer and limitations

This report may be relied upon by Aurizon only for the purpose of understanding the market cost of equity and the related issues identified. It should not be relied upon for any other purpose. Other persons accessing this report should do so for their general information only as EY has only acted for, and advised the Aurizon, and has not acted for or advised anyone else in respect of the contents of this report.

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The services provided by EY do not constitute an audit in accordance with generally accepted auditing standards, or a review, examination or other assurance engagement in accordance with auditing and assurance standards issued by the Australian Auditing and Assurance Standards Board. Accordingly, we do not provide an opinion or any other form of assurance under audit or assurance standards.

Except to the extent that we have agreed to perform the specified scope of work, we have not verified the accuracy, reliability or completeness of the information we accessed, or have been provided with by the client, in preparing this report.

2.3 Structure of this report

The remainder of this report is structured as follows:

- Section 3 describes the role of independent experts
- Section 4 sets defines the market cost of equity
- Section 5 describes the approach we have taken to the review of the independent expert reports
- Section 6 describes the results of that review for the market cost of equity and several related matters
- Section 7 summarises some related evidence.

Other detailed technical information is provided in Appendices for technical users of this Report.

- Appendix A contains the full list of independent expert reports that were the subject of our analysis
- Appendix B contains the adjustments made by the independent experts including the direct adjustments to the risk free rate.

3. The role of independent experts

Independent experts play an important role in transactions in specific circumstances.

The Corporations Act and the ASX Listing Rules specify the circumstances where an expert report must be issued to those shareholders who are affected by certain types of transactions (e.g. takeover bids, mergers/schemes, related party transactions, buy-backs, acquisitions / divestments, and others). Even where there is no requirement for an expert report under the Corporations Act or the ASX Listing Rules, the directors of a company may still voluntarily commission an expert report to assist security holders in making informed decisions in relation to certain proposed transactions (e.g. as part of assessing a bid from a party which is associated but not considered a 'related party' due to not meeting certain shareholding thresholds).

Expert reports set out the expert's opinion on whether a proposed transaction is 'fair and reasonable' and / or 'in the best interests of' affected shareholders. These terms are not defined in the Corporations Act and the ASX Listing Rules, however, guidance on their meaning and the factors which an expert should consider in arriving at its opinion is provided by ASIC in Regulatory Guide 111, Content of expert reports. Regulatory Guide 112 provides guidance on the Independence of experts.[5]

An expert must consider the value of the benefit received versus value of the benefit provided to the counterparty in expressing an opinion on the fairness of the transaction. As such, the expert's report would generally (but not always) contain a valuation of the asset(s).

Most experts have regard to the results of more than one valuation methodology in arriving at their valuation of an asset. They typically consider the results from a primary valuation methodology against other valuation methodologies. The choice of valuation methodology to employ will depend upon the specific attributes of the asset as well as the availability of reliable information.

The cost of equity is typically estimated where a discounted cash flow method of valuation is employed by the expert to value the asset, either as the primary or secondary method of valuation. The expert may decide not to value an asset using a discounted cash flow methodology in instances where it is not possible to make reliable forecasts of the future net cash flows of the asset.

The independent expert reports are prepared by accredited independent experts, working within an explicit regime of regulation, comprising both formal statutory rules and less formal guidelines, which require that the experts be accountable for the results of their work. They therefore face strong incentives to produce analysis that is informed and accurate.

The experts preparing independent expert reports which express an opinion as required by under the Corporations Act or ASX Listing Rules should be experts in their field. Section 9 of the Corporations Act defines an expert as *"a person whose profession or reputation gives authority to a statement made by him or her"*.[6] Independent experts are expected to state their qualifications and experience in the independent expert reports they prepare.

ASIC requires that experts who prepare an independent expert report:

- Cannot be associated with certain parties who have interests in the transaction for which the independent expert report is prepared
- Must disclose certain relevant interests and relationships when preparing reports required by the Corporations Act

[5] ASIC, Regulatory Guide 111: Content of expert reports, March 2011 and ASIC, Regulatory Guide 112: Independence of experts, March 2011. These guidelines superseded versions dated October 2007 and included some revisions to provide additional guidance on various matters.

[6] Commonwealth Government, Corporations Act 2001

- Must hold an Australian financial services licence which imposes obligations to manage potential conflicts of interest.

In paragraph 111.128 of Regulatory Guide 111, ASIC advises that it will consider regulatory action if it considers there are material issues about the adequacy and completeness of an independent expert's analysis, or if it has concerns about the expert's independence. Regulatory action may include revocation or suspension of the independent expert's licence.

The assumptions and estimates made for the purpose of arriving at a cost of equity, and the reasons for using that cost, are usually explicitly documented in the independent expert report. ASIC's Regulatory Guide 111 recommends that an expert:

- Justify its choice of methodology or methodologies and describe the method or methods used in its report[7]
- Disclose all material assumptions on which its report is based.[8]

Independent expert reports blend financial theory with day-to-day experience in capital markets in applying the CAPM. For example, independent expert reports often use the CAPM to estimate the cost of equity, but typically:

- Exercise discretion in the application of the CAPM and the interpretation of data (e.g. they vary how they may derive parameter estimates) in recognition of the limitations of the model
- Assess the valuation results obtained from the application of the CAPM with the values obtained from using other methods (or vice versa, depending on the respective quality of the relevant information). These other methods typically include capitalising earnings or (near term) prospective earnings using observed trading and / or transaction multiples, or estimating discount rates using the Dividend Growth Model.

Independent experts thereby corroborate the results obtained from the use of the CAPM to ensure the results accord with market expectations. The valuation produced reflects the value at a point in time, sometimes referred to as the valuation date.

The cost of equity provided in independent expert reports is the evidence of expert capital market practitioners acting independently in accordance with defined standards of independence, and based on documented and explicitly justified analysis. It is therefore the best market evidence publicly available to assess the prevailing cost of equity in the Australian market for funds.

3.1 The roles of independent experts and economic regulation

The roles of independent experts and economic regulators are different. The former is seeking to provide a fair and reasonable valuation of an asset at a point in time. The latter is seeking to set prices at a point in time for a particular period of time. In the respect of the cost of equity, however, both are seeking to estimate a cost of equity at a point in time that reflects the requirements of investors.[9] On that basis it is not obvious why a material discrepancy in their estimates should exist.

To the extent that economic regulators are providing a lower cost of equity than that estimated by independent experts, and the latter provides a more accurate reflection of investors' requirements,

[7] ASIC Regulatory Guide 111, paragraph 111.67

[8] ASIC Regulatory Guide 111, paragraph 111.75

[9] Most regulators do that by using a 10 year risk free rate (i.e. not aligned to the regulatory period) and a market risk premium that is measured consistent with that term, which is how the market risk premium is typically measured. The QCA aligns its measure of the risk free rate with the term of the regulatory period. Provided the market risk premium is measured on a consistent basis, then the results should be identical.

then it can be expected to have a detrimental impact on investment. Moreover, the prices of regulated services are likely to differ from those of non-regulated services (i.e. those observed in workably competitive markets), the outcomes of which regulation is typically seeking to replicate. Indeed, in this respect, regulated prices are likely to be more volatile than the prices of non-regulated services.

4. Defining the market cost of equity

Capital market practitioners, including those charged with preparing independent expert reports (independent experts) estimate the cost of equity for the purpose of valuing certain business and investment opportunities (transactions).

The cost of equity is typically estimated and then blended with a cost of debt to establish a discount rate (often defined as a Weighted Average Cost of Capital or WACC) which is, in turn, used to discount future cash flows expected if a transaction were to proceed.[10] The discounted value of the future net cash flows, the present value of the transaction, is a measure of the market value of the business or asset. It may be compared with the present values of alternatives to the transaction, including the alternative of "doing nothing".

The cost of equity is the return that the market expects from an investment given the risks associated with it. The actual cost of equity may change during the period in which cash flows are expected to occur. However, most valuations typically apply a single discount rate which represents a best estimate (given the information available at the valuation date) of the forward-looking discount rate anticipated to prevail over the period of the expected cash flows.

The cost of equity is not directly observable, so it must be estimated or inferred from market data. Finance theory usually guides the process of estimation and the CAPM is often applied in this process.

The CAPM explains the expected rate of return on a financial asset as the sum of a risk free rate of return and a premium for risk:

$$k_e = r_f + \beta \times (r_m - r_f)$$

where:

- ke - is the nominal post-tax expected cost or, rate of return on equity
- rf - is the nominal risk free rate of return. In Australia, it is generally measured based on the yield on the 10 year Commonwealth Government bond
- β (beta) - is the contribution which the financial asset in question makes to the riskiness of an investor's portfolio
- rm - is the expected return on the market portfolio[11]
- (rm - rf) represents the excess return over the market portfolio. It is also commonly referred to as the market risk premium or MRP

Independent experts widely use the CAPM to estimate the cost of equity.

The QCA also has applied the CAPM in its recent decisions relating to Aurizon's regulated network assets.

4.1 The market cost of equity

The focus of this report is on the market cost of equity defined as:

Market cost of equity = Risk free rate + Market Risk Premium

[10] The most commonly used WACC formulation is the after-tax nominal WACC which is calculated as the sum of [After-tax cost of Debt X Gearing] and [Cost of Equity X (1-Gearing)].

[11] As noted later in Section 4.1, the market cost of equity is the sum of risk free rate and market risk premium assuming a beta of 1.0.

It should be noted that the market cost of equity is not directly estimated by the expert; instead the expert estimates a cost of equity by including a beta factor which is specific to the asset or project being assessed, which is multiplied by the MRP. Given the expert's view on the risk free rate and the MRP, the expert's view on the market cost of equity can be estimated. The market cost of equity implicitly assumes that the beta factor equals 1.0 (i.e. the beta factor for the entire market). The market cost of equity therefore reflects the expert's view on the cost of equity for the market as a whole.

4.2 The QCA's recent decisions

4.2.1 QCA approach

The QCA outlines its current approach to the risk free rate and the MRP in its Final Decision on the cost of capital market parameters[12], published in August 2014 ("Market Parameters Decision"). This decision paper outlines the QCA's preferred approach to estimating the market parameters for the regulatory cost of equity and is applied consistently across all regulatory determinations made by the QCA from this date.

Risk free rate

The risk free rate is the rate of return on an asset with zero default risk. The QCA relies on the Commonwealth Government bond as a proxy for the risk-free asset and uses the following approach to estimate this.

The QCA outlines in its Market Parameters Decision that it sets the risk free rate by taking an average of the expected rates of return over 20 business days as close as possible to the start of the regulatory cycle. Australian regulators use averaging periods in the range of 10 – 40 business days to avoid the potential problem of pricing anomalies that could impact a single day's rate.

The QCA's current approach aims to align the term of the Commonwealth Government bond with the regulatory period (i.e. 'term-matching'). This is based on its application of the NPV = 0 Principle ("the Principle") when making regulatory decisions, which states that the value of the regulated firm's expected net cash flows should equal the investor's initial investment. For example, for firms subject to a five year regulatory period, the QCA uses the five year bond as a proxy to establish the risk free rate. Aurizon has a four year regulatory cycle so the QCA uses a four year risk free rate.

The QCA believes that this approach is necessary to satisfy the requirements of the Principle.

For UT1 and UT2 determinations, the QCA preferred to estimate the risk free rate with reference to 10-year Commonwealth Government Bonds, using an averaging period of 20 business days. However the QCA first diverted from the use of the 10-year Commonwealth Government bonds in the 2009 Aurizon determination where they used a 5-year Commonwealth Government bond in its determination of the risk free rate.

Market risk premium

The MRP reflects the additional return on equity that an investor requires to be compensated for the additional risk of investing in a market portfolio as against purchasing a risk free asset. The MRP is unobservable and must be estimated.

In its Market Parameters Decision, the QCA stated its preference for a MRP of 6.5%, having regard to the broader range of evidence at hand, and has consistently applied this position in all regulatory determinations since 1 July 2013.

The QCA refined its methodology in response to stakeholder submissions, modifying its traditional methods and examining additional information, including current financial market-related evidence.

[12] QCA, Cost of capital: market parameters – Final decision, August 2014

Since the broader range of evidence does not lend itself to an averaging or rounding procedure, the QCA assessed the information at hand and exercised its judgment to reach a final view on the appropriate rate.

In UT4, the QCA, pursuant to its refined methodology, applied four different approaches, comprising two historical methods and two forward looking methods, to estimate the MRP without disclosing the weights ascribed to each method. The QCA also examined additional information including current financial market-related evidence to make a decisions on the MRP.[13]

Prior to the Market Parameters Decision, the QCA's estimate of the MRP has been broadly consistent with the estimates from other regulators and market analysts.

4.2.2 QCA decisions

It should be noted that the market cost of equity is not directly estimated by the QCA; instead it estimates a cost of equity by including a beta factor which is specific to the asset or project being assessed, which is multiplied by the MRP. Given the QCA's view on the risk free rate and the MRP, its view on the market cost of equity can be estimated.

Table 2 shows all WACC decisions made by the QCA since 2008 as part of its regulatory decisions or access undertakings. It also includes the WACC decisions for Aurizon prior to 2008 (i.e. UT1 and UT2).

[13] These approaches are the Ibbotson historical averaging approach, the Siegel historical averaging approach, the Cornell method and survey evidence.
QCA; Cost of Capital: Market Parameters Final Decision, August 2014, page 16

Table 2: The QCA's Decisions

	Aurizon UT1	Aurizon UT2	DBCT 2006	Aurizon UT3	DBCT 2010	Gladstone Water Board 2010 - 2015	SEQ Urban Water 2011	SunWater Irrigation Prices 2012	SEQ Urban Water 2013	Queensland Rail 2013	SEQ Irrigation Prices 2014	Gladstone Water Board 2015 - 2020	DBCT 2016	Aurizon UT4	Queensland Rail 2016
Determination date	*Dec 01*	*Dec 05*	*Jun 06*	*Dec 09*	*Jun 10*	*Jun 10*	*Mar 11*	*May 12*	*Sept 14*	*Jun 13*	*April13*	*May 15*	*Apr 16*	*Apr 16*	*Jun 16*
Nominal risk free rate															
- Cost of equity estimation	9.77%	10.61%	11.84%	9.77%	11.08%	9.06%	8.85%	7.06%	6.69%	7.06%	6.19%	6.10%	7.76%	8.41%	7.20%
- Cost of debt estimation	6.41%	6.64%	7.14%	6.41%	9.04%	9.86%	9.69%	7.79%	6.49%	7.79%	6.21%	4.72%	5.00%	6.15%	4.72%
Inflation		2.50%	2.50%	2.80%	2.48%	2.50%	2.48%	2.50%	2.50%	2.00%	2.50%	2.60%	2.50%	2.50%	2.50%
Equity beta	0.76	0.9	1.0	0.8	1.0	0.65	0.66	0.55	0.66	0.80	0.55	0.64	0.87	0.80	0.80
Market risk premium	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.50%	6.00%	6.50%	6.50%	6.50%	6.50%
Debt risk premium	1.20%	1.43%	1.30%	4.75%	3.96%	4.86%	4.78%	4.03%	3.73%	3.24%	3.32%	2.80%	2.90%	2.94%	2.52%
Gearing	55.0%	55.0%	60.0%	55.0%	60.0%	50.0%	60.0%	60.0%	60.0%	55.0%	60.0%	50.0%	60.0%	55.0%	55.0%
Rate of return proposal															
Nominal vanilla WACC	7.92%	8.43%	9.02%	9.96%	9.86%	9.46%	9.35%	7.49%	6.57%	6.93%	6.20%	5.41%	6.10%	7.17%	5.73%
Implied market cost of equity															
Risk free rate	5.21%	5.21%	5.84%	5.19%	5.08%	5.18%	4.91%	3.76%	2.76%	2.81%	2.89%	1.92%	2.10%	3.21%	2.00%
Market risk premium	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%	6.50%	6.00%	6.50%	6.50%	6.50%	6.50%
Market cost of equity	11.21%	11.21%	11.84%	11.19%	11.08%	11.18%	10.91%	9.76%	8.76%	9.31%	8.89%	8.42%	8.60%	9.71%	8.50%

5. Approach to estimating the market cost of equity

In assessing the prevailing cost of equity in the Australian market for funds, the focus has been on how independent experts estimate those components of the CAPM which are influenced by market-wide factors, namely, the risk free rate and MRP. This analysis therefore focuses on the market cost of equity.[14]

The market cost of equity reflects the expected rate of return from investing in the Australian equity market as a whole. The Australian equity market has a beta of 1.0 so, in terms of the CAPM, the market cost of equity is the sum of the risk free rate of return and the market risk premium. Like the cost of equity, it cannot be directly observed.

5.1 Data selection

To assess the prevailing cost of equity in the Australian market for funds, independent expert reports have been reviewed and analysed.

In undertaking this review and analysis, the independent expert reports from the CONNECT 4 Expert Reports database have been relied on. CONNECT 4 is a web-based system, operated and maintained by the Thomson Reuters company, which provides information on companies listed on the ASX.[15]

The CONNECT 4 Expert Reports database contains specialist reports which have been produced on behalf of ASX Listed companies, dating back to 1992. The Expert Reports in this database deal with proposals including mergers/schemes, acquisitions, divestments, capital reductions, buybacks, reconstructions, de-mergers, takeovers, dual listings, spin-offs, and others. Expert Reports may also be found in other CONNECT 4 databases including the Takeovers database and Company Announcements database.

The choice of datasets used was informed by a discussion with Thomson Reuters, who advised that the Expert Reports database contains all Expert Reports that they have identified that were produced on behalf of ASX-listed companies, whereas the Takeover database only includes the subset of the Expert Reports in relation to Takeover proposals and the Company Announcements database only includes Expert Reports when available and relevant to the particular announcement.

CONNECT 4 specialises in providing information on companies listed on the ASX and, as advised by Thomson Reuters, makes the 'best efforts' to collect Expert Reports that were produced on behalf of ASX-listed companies. In cases where the relevant parties decided not to release the Expert Reports to public, the Reports might not be available in the CONNECT 4 databases.

The set of reports in the CONNECT 4 Expert Reports database is taken as being the population of reports appropriate for the purposes of the analysis and review for this assignment.

5.2 Sample selection

On Tuesday 4 October 2016, all expert reports that were issued (based on the date of the expert report) between 1 January 2008 and 31 December 2015 were extracted from the CONNECT 4 Expert Reports database.

This timeframe was selected to provide a longer term perspective of how experts estimate the cost of equity, and to capture any trends in the way independent experts estimate the cost of equity.

[14] In making such inferences, it is noted that whilst the independent expert makes assumptions on the appropriate values for the risk free and market risk premium (i.e. the market cost of equity), these assumptions are made in the process of arriving at the overall cost of equity for the asset they are valuing.

[15] Further information is available at http://www.connect4.com.au/

This period captures a period of time preceding the onset of the GFC. This sample (and subsets of it) may not necessarily reflect the entire market; indeed, it is likely to be more reflective of the type and level of transactional activity in the market. For example, during this period, a significant amount of that transactional activity has been in the resources sector. These sample issues, however, should not be a concern given that the analysis focuses on the market cost of equity.

Through the above process a total of 1,608 independent expert reports have been identified.

Of these 1,608 reports, 201 (12.5%):

- Provided enough information on how the cost of equity was estimated
- Included a valuation of a transaction
- Employed a discounted cash flow valuation method to value a company or its underlying assets/projects or a specific part of its operation, either as the principal method of valuation or as a cross-check on the results of the principal valuation method
- Used the CAPM to derive the cost of equity.[16]

The distribution of independent expert reports issued in the period 1 January 2008 to 31 December 2015, by calendar year, are shown in Table 3.

Table 3: Number of expert reports which used the CAPM to estimate the cost of equity

Year expert report issued	Number of experts reports	Number of expert reports which applied the CAPM to estimate the cost of equity
2008	170	23
2009	228	22
2010	219	32
2011	217	38
2012	190	27
2013	193	17
2014	188	18
2015	203	24
Total	1,608	201

The 201 independent expert reports which were identified as including an estimated cost of equity derived by applying the CAPM were prepared by 22 different independent experts. These experts are listed in Table 4, which shows the sample market share of the expert by number of reports produced and by transaction value, as sourced from CONNECT 4.[17]

[16] Those excluded primarily related to low value transactions or those reports where the independent expert may decide not to value an asset using a discounted cash flow methodology because it is not possible to make reliable forecasts of the future net cash flows of the asset. This also excludes those reports that estimated a cost of equity and discount rate using data from offshore markets and those that relied on other Commonwealth Government bonds (e.g. 2 year bonds) chosen for specific purposes (e.g. the life of the asset relevant to the transaction) and therefore do not provide an appropriate basis for comparison.

[17] This includes reports where Ernst & Young (EY) was the independent expert. These were prepared in accordance with the relevant sections of the Corporations Act and the ASX Listings Rules. The independent expert reports were also prepared by separate EY teams who have not been involved in preparing this report.

Table 4: Numbers of reports which used the CAPM to estimate the cost of equity by expert and by value

Name of expert	Number of reports issued	% of reports issued	% by reported transaction value
Deloitte	39	19.40%	18.26%
BDO	30	14.93%	3.98%
Grant Samuel	28	13.93%	60.32%
Grant Thornton	22	10.95%	1.80%
Lonegran & Edwards	20	9.95%	6.13%
KPMG	12	5.97%	6.36%
EY	11	5.47%	0.26%
RSM Bird Cameron	11	5.47%	0.13%
InterFinancial	6	2.99%	0.12%
Leadenhall	5	2.49%	0.05%
PwC	3	1.49%	2.39%
Crowe Horwath	2	1.00%	0.01%
Hallchandwick	2	1.00%	0.03%
Education and Management Consulting Services	1	0.50%	0.001%
HanrickCurran	1	0.50%	0.07%
PKF	1	0.50%	0.03%
Titan Partners	1	0.50%	0.004%
DMR Corporate	1	0.50%	0.03%
Haines Norton	1	0.50%	0.01%
Moore Stephens	1	0.50%	0.001%
VMC Global	1	0.50%	0.004%
Value Adviser	1	0.50%	0.01%
William Buck	1	0.50%	0.01%
Total	201	100%	100%

Of the 201 reports, 116 (or 58%) related to takeovers which were identified as successful in the CONNECT 4 Expert Reports database. [18]

All of the expert reports contained the values that the expert identified for the risk free rate, beta and MRP in the CAPM formula.

Some experts employed a modified version of the CAPM which involved including an additional asset specific risk factor (e.g. size, illiquidity, etc.). In many cases, they also provided the result of their calculated cost of equity using the CAPM (or modified CAPM), which is then used to estimate a Weighted Average Cost of Capital ("WACC") given additional assumptions on gearing and cost of debt.[19]

The expert often then subsequently adjusted the calculated WACC before arriving at the discount rate that they applied to the transaction. That is:

Final WACC applied = Calculated WACC + Adjustment

In cases where the adjustment was less than 25 basis points, this was classified as a rounding adjustment. It is important to note that in cases where the uplift was attributable to the cost of equity component, EY did not attempt to identify whether the adjustment was to the risk free rate or the MRP, as there was generally insufficient information to disaggregate the uplift in this way. In these cases, the entire adjustment was attributed to the market cost of equity.

[18] Expert reports are prepared for a range of transactions other than takeovers. CONNECT 4 does not provide statistics on successful transaction other than for takeovers.

[19] WACC = (1-Gearing %) X Cost of equity + Gearing % X (1- Tax rate) X Cost of debt

6. Results of our analysis

This section provides the results of our analysis. More specifically, it:

- Provides the results of the analysis
- Compares that to what the QCA's work suggests
- Examines the reasons for the discrepancy
- Discusses the implications for how the value of imputation credits is taken into account.

6.1 Independent experts and the market cost of equity

The views of the experts on the average market cost of equity between 2008 and 2015 can be implied by:

- Adding the risk free rate to the market risk premium as applied in these 201 reports[20]
- Where it has been identified in any of the reports that the cost of equity or the discount rate applied differs from that calculated by the expert, adding the difference to the sum of the risk free rate and the market risk premium in (a), taking into account the assumed gearing level.

Using this approach, our analysis indicates that the average market cost of equity implied by independent experts during the period from 2008 to 2015 is 11.10%. However there is significant variation in the independent experts' estimates in each year of this period, as shown in Table 5.

Table 5: Summary of Implied market cost of equity

Year	Expert Implied market cost of equity (A)
2008	12.05%
2009	11.82%
2010	11.71%
2011	11.13%
2012	10.59%
2013	10.48%
2014	10.76%
2015	10.10%
2008 – 2015	11.10%

This approach attributes any difference between the cost of equity or discount rate applied and that calculated to the market cost of equity (i.e. in addition to the risk free rate and the market risk premium), rather than attributing this difference to the cost of debt or the equity beta.

Based on our review, we observe that independent experts considered, in light of prevailing market conditions, whether:

- Observed bond yields provide a suitable basis for measuring the risk free rate of return
- It is appropriate to adopt a market risk premium higher than commonly adopted particularly in response to what is implied by the observed bond yields; and / or
- The overall cost of equity and / or discount rate calculated using the CAPM and the WACC formulae appropriately reflect market expectations.

[20] Where ranges are used, I have taken the mid-point value.

6.2 Comparison with the QCA's Decisions

The market cost of equity implied from independent expert reports from 2008 to 2015 has been compared to the market cost of equity implied in the QCA's Regulatory Decisions.

This involved:

- Taking the market cost of equity implied in each of the 201 reports
- Re-estimating the implied market cost of equity in each of the 201 reports assuming that the approach adopted by the QCA was applied in selecting the values for the risk free rate and market risk premium.[21] The implied market cost of equity obtained based this approach (averaged across the 201 expert reports) is hereinafter referred to as the 'QCA's implied market cost of equity'
- Subtracting the QCA's implied market cost of equity in (b) above, from the independent experts' implied market cost of equity in (a) above.

Appendix A provides the results of the above comparison for each of the 201 reports, and on average across the 201 reports. It shows that across 2008 to 2015:

- The independent experts' implied market cost of equity is 11.10% on average
- The QCA's implied market cost of equity is 9.89% on average
- The independent experts' estimate is 1.20 percentage points higher than the QCA's estimate.[22]

Figure 2 below highlights the discrepancy between the market costs of equity determined by independent experts and by the QCA in its Regulatory Decisions. It shows the implied market costs of equity of independent experts from 2008-2015 compared with the implied market cost of equity of QCA Regulatory Decisions.

It illustrates that the QCA's implied market costs of equity lie well below the trend line and the bottom end of the range implied by the contemporaneous independent expert reports.[23]

It is also evident from the figure that the gap between the implied market cost of equity of independent experts and the implied market cost of equity of the QCA has increased significantly since 2012. This is still the case despite the QCA increasing its MRP by 50 basis points.

[21] This involves estimating the nominal risk free rate (which we sourced from the Reserve Bank of Australia statistics F2 Capital Market Yields – Government Bonds, sourced on 11 October 2012) using a previous twenty-day average period from the date where the expert observed the risk free rate or report date where the former was not identified. Because of the uncertainty over the precise period to apply, the sensitivity of the results has been tested using different measurement periods. It does not materially alter the results.

[22] This is prior to the consideration of imputation credits, which is discussed in Section 6.4, and which have the effect of expanding the difference between the implied market cost of equity of independent experts and of the QCA.

[23] This is prior to the consideration of imputation credits, which is discussed in Section 6.4, and which have the effect of expanding the difference between the implied market cost of equity of independent experts and of the QCA.

Figure 2: Implied Market Cost of Equity

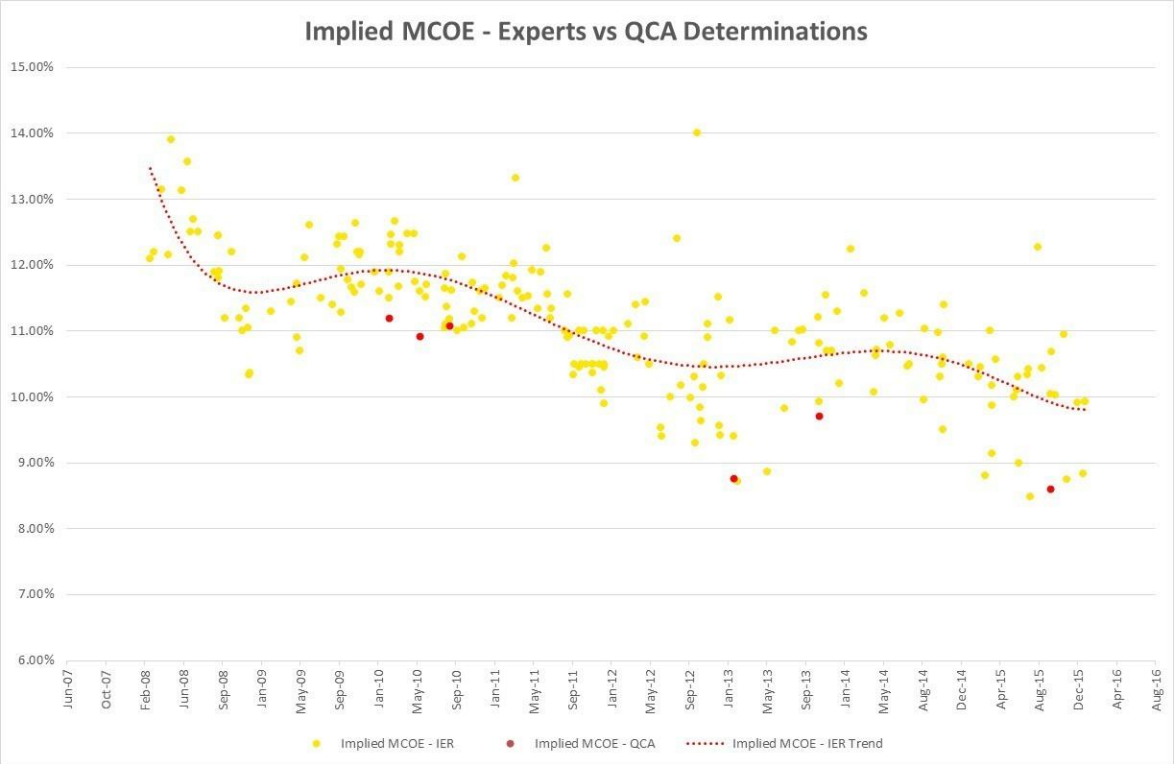


Table 6 below compares the implied market cost of equity from expert reports with the implied market cost of equity in the QCA's decisions over the period for the rail, water and ports sectors.

Table 6: Summary of Implied market cost of equity

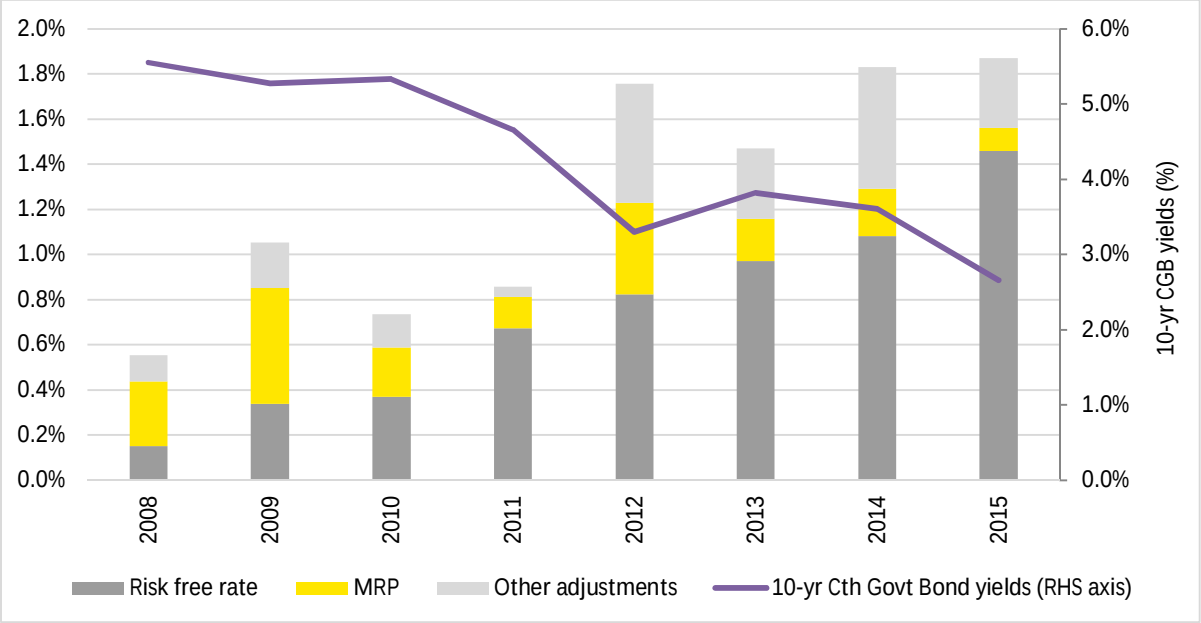
Year	Expert Implied market cost of equity (A)	QCA Implied market cost of equity (B)	Difference (A – B)
2008	12.05%	11.49%	0.55%
2009	11.82%	10.76%	1.06%
2010	11.71%	10.97%	0.74%
2011	11.13%	10.27%	0.86%
2012	10.59%	8.83%	1.76%
2013	10.48%	8.99%	1.47%
2014	10.76%	8.93%	1.83%
2015	10.10%	8.24%	1.87%
2008 – 2015	11.10%	9.89%	1.20%

Figure 3 shows the difference between the experts' implied market cost of equity and the QCA's implied market cost of equity between 2008 and 2015 and shows whether the difference is attributable to:

- Different values assumed for the risk free rate
- Different assumed MRP
- Other adjustments adopted by the independent experts.

The figure also compares this with the yields on 10-year Commonwealth Government Bonds.

Figure 3: Difference between IERs' and QCA's implied market cost of equity by component



It shows that the difference between the market cost of equity as implied by the independent experts and the QCA:

- Was largely driven by the MRP in 2008 and 2009
- Since 2010, has become more influenced by different assumptions for the risk free rate and adjustments to the discount rate made by the independent experts
- The difference in the MRP also spiked in 2012, driven by the increased estimates implied by independent experts. The reasons are not entirely clear and may not be consistent across experts, but were likely to be driven by the decline in global equity markets at the time which were reflected in difficulties in raising equity capital and a greater risk premium being demand by investors[24]
- Is inversely related to the trend in the overall risk free rate (i.e. average yields on 10 year Commonwealth Government Bonds).

6.3 The reasons for the discrepancy

The reasons for this discrepancy are explained by examining how independent experts apply the CAPM.

6.3.1 How independent experts apply the CAPM

In developing the independent expert reports, the key objective is to estimate a discount rate and, in particular, to obtain their best estimate of a cost of equity for the relevant business at a point in time, which reflects their perceptions of investor expectations.

In applying the CAPM to estimate the cost of equity in the Australian market, independent experts as a starting point commonly:

- Estimate the risk free rate based on the yield on a long term (typically 10 years for Australian assets) Commonwealth Government bond observed as at the valuation date (or in the immediate period preceding it)

[24] For example, refer to Deloitte, Independent Expert Report and Financial Services Guide: Gloucester Coal Ltd, April 2012, page 108

- Apply a value for the MRP that is consistent over time, with 6% being the minimum and most commonly applied point estimate[25]
- Select a value for beta that is, where sufficient information is available, consistent with the observed range for beta and gearing levels of comparable publicly listed companies.

It is also apparent that most independent experts consider the CAPM as a tool which provides guidance to derive the appropriate cost of equity and discount rate. This is evident from how the discount rate and, the cost of equity in particular, are defined and estimated. For example:

- The discount rate and the cost of equity are often defined as a range as opposed to a point estimate to avoid spurious precision. There is also generally more uncertainty (and hence, room for estimation error) associated with estimating a value for each component of the cost of equity compared to the cost of debt
- Independent experts consider a range of factors in their selection of parameter values to achieve the key objective, including the reliability of the data they observe and the degree to which the data is consistent with their knowledge of the asset they are valuing.

As a result, independent experts modify their application of the CAPM to ensure that it yields costs of equity and / or discount rates which are consistent with market expectations.

These approaches to selecting parameter values or deriving the cost of equity or discount rate are employed by independent experts across all stages of the estimation process to:

- All the parameters that theoretically make up the cost of equity:
  - the risk free rate
  - the market risk premium
  - the equity beta, potentially including its derivation (e.g. gearing)
- The overall cost of equity estimate itself or discount rate, both implicitly and explicitly, apparently in lieu of selecting different parameter values. These are, for example, evident from the difference between the calculated discount rate and the discount rate which the independent expert applied to discount cash flows.

Independent expert reports in 2015

Based on our assessment of the 24 independent expert reports in 2015 that qualified for our review, the independent experts made adjustment in 23 instances.[26] We observed that experts applied the CAPM in different ways, including:

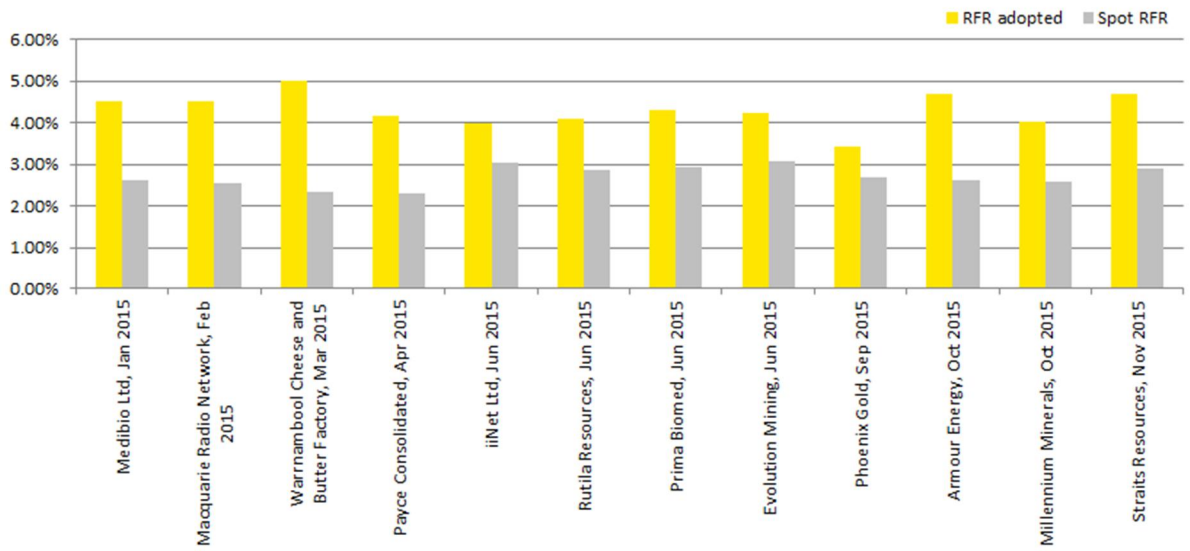
- Applying company or project specific risk premia (i.e. adding an "alpha" factor to the conventional CAPM formula) to account for risk factors not captured by beta. One report (Grant Thornton, for Medibio Limited) applied a total beta factor as opposed to the standard systematic risk only measure of beta
- Using longer term averages of the government bond yield for the risk free rate as opposed to a short term, contemporaneous or "spot" value
- Increasing the overall inputs-based CAPM cost of equity or discount rate applied based on wider market considerations.

[25] This does not suggest that valuation experts view MRP as constant, as they often make adjustments to the risk free rate or the overall cost of equity to reflect the prevailing market conditions.
[26] The 7 reports in 2015 that did not appear to make any adjustments were produced by Grant Thornton (4), BDO (2) and KPMG

Of the 23 independent expert reports that made adjustments, we identified 12 reports where the independent expert made direct adjustments to the risk free rate. In other words, the expert adopted a higher risk free rate in its report than the prevailing spot risk free rate at the time.

The figure below compares the risk free rate adopted by the expert against the prevailing spot risk free rate at the date of the expert report for these 12 reports. Of the 12 reports which made such direct adjustments, the average adjustment was 1.60 percentage points (range of 75 basis points to 267 basis points). Six of these assessments based the risk free rate on five year averages of the 10 year government bond yield, whilst two assessments adopted a 10 year averaging window.

Figure 4: Direct adjustments to the risk free rate[27]



In the case of iiNet for example, the expert, Lonergan Edwards adopted a risk free rate in its report of 4% which was almost 1 percentage point higher than the then prevailing yield on the 10 year Australian government bond. Lonergan Edwards noted that:

> "*In our view, the application of the current (very low) government bond yields and long-term average MRP is inappropriate in the context of determining required equity rates of return (discount rates). Theoretically, the anomalous currently low government bond interest rates could be allowed for by increasing the MRP. However, as it is difficult to reliably measure short-term movements in the MRP, we have instead increased the risk-free rate for the purposes of estimating required equity rates of return. This is consistent with the approach adopted by other valuation experts and the investment analysts which provide research reports on ii Net."*[28]

In addition to the direct adjustments to the risk free rate, we identified 4 independent expert reports (which included 6 discount rate assessments, given the assessment of Asciano in September 2015 contained multiple assessments) with uplifts at the overall WACC level (i.e. WACC applied exceeded calculated WACC) not explicitly attributed to asset / project specific factors.[29] All of these assessments were undertaken by Grant Samuel and all cited factors such as low government bond yields as the primary reason for the adjustment.

[27] Note that we observed differences in the risk free rates quoted by BDO in their assessment of the discount rate for Coalspur Mines (February 2015) and CIC Australia (March 2015) however, we have not included these in the chart above. In both assessments, the risk free rate used in the calculation of the cost of equity differed from the value indicated in the risk free rate discussion. The source of the variation in both is unexplained.

[28] Lonergan Edwards & Associates Limited, Independent Expert Report, iiNet Ltd, 10 June 2015, page 104.

[29] Note that we have excluded the February 2015 expert report for Coalspur Mines. The expert did not included a project specific risk factor in the CAPM formula but explained that the choice of the higher than calculated WACC that it applied was to adjust for project specific risk. We have also excluded the March 2015 expert report for CIC Australia which applied a higher uplifted WACC for more distant future cash flows as the expert attributed the uplift to project specific risks.

Table 7: Market cost of equity uplifts based on adjustments made to the overall WACC

Company	Expert	Expert report date	Calculated market cost of equity	Adjusted market cost of equity	EY assessed MCOE uplift
TOLL	Grant Samuel	1/04/15	8.50%	9.15%	+ 0.65%
Novion	Grant Samuel	14/04/15	8.32%	10.56%	+ 2.24%
SKILLED Group	Grant Samuel	24/06/15	8.80%	12.27%	+ 3.47%
Asciano – Pacific National	Grant Samuel	29/09/15	8.80%	10.05%	+ 1.25%
Asciano – Patrick T&L	Grant Samuel	29/09/15	8.80%	10.74%	+ 1.94%
Asciano – Building and Auto Products	Grant Samuel	29/09/15	8.80%	10.27%	+ 1.47%
Average			8.67%	10.51%	+ 1.84%

6.3.2 Relevant examples of how independent experts apply the CAPM

There are a few expert reports which warrant closer examination as they provide relevant examples of how market considerations affect an independent expert's assessment of the cost of equity and / or discount rate.

Independent experts tend to adopt the same approach to reflecting market considerations in their estimates of the cost of equity or discount rate. Of the independent experts that used the CAPM to estimate the cost of equity between 2008 and 2015, the top 8 experts by number of reports (which together developed 86% of the 201 reports in our review, as shown in Table 4) specifically noted how their assessments of the appropriate cost of equity or discount rate were impacted by market considerations.

Grant Samuel's recent assessment of the proposed acquisition of SKILLED Group appears to apply a cost of equity of 12.8% when its calculated cost of equity was 9.4%. It stated as follows:

> *"In Grant Samuel's opinion, these calculations understate the true cost of capital. In this context:*
>
> - *anecdotal information suggests that equity investors have substantially repriced risk since the global financial crisis and that acquirers are pricing offers on the basis of hurdle rates well above those implied by theoretical models. However this has yet to be translated into the measures of market risk premium (at least those based on longer term historical data). In this regard, an increase in the market risk premium of 1% (i.e. from 6% to 7%) would increase the calculated WACC range to 8.2-9.3%;*
> - *global interest rates, including long term bond rates, are at very low levels by comparison with historical norms reflecting the liquidity being pumped into many advanced economies to stimulate economic activity. Effective real interest rates are now low, if not negative in some jurisdictions. Grant Samuel does not believe this position is sustainable and the risk is clearly towards a rise in bond yields. Conceptually, the interest rates used to calculate the discount rate should recognise this expectation (i.e. they should be forecast for each future period) but for practical ease market practice is that a single average rate based on the long term bond rate is generally adopted for valuation purposes. Some academics/valuation practitioners consider it to be inappropriate to add a "normal" market risk premium (e.g. 6%) to a temporarily depressed bond yield and therefore advocate that a "normalised" risk free rate should be used. On this basis, an increase in the risk free rate to (say) 5% would increase the calculated WACC range to 9.5-10.5%; and*
> - *analysis of research reports on SKILLED indicates that brokers are currently adopting WACCs in the range [of] 10.8-11.5% with a median of 11.1%."*[30]

Grant Samuel made similar statements in respect of its expert reports for Novion Proprety Group (where it also applied a different discount rate to that estimated). This report also stated that:

> *"strict application of the CAPM at the present time gives results that are uncharacteristically low (primarily because of very low government bond rates) and are inconsistent with other measures."* [31]

[30] Grant Samuel, Independent Expert Report for SKILLED Group Limited: Offer by Programmed Maintenance Services Limited, 21 August 2015, page 59

The discussion by Grant Samuel around earnings multiples raises a key issue relevant to the implied market cost of equity, particularly given the circumstances that relate to the ongoing dispute between regulated utilities and the regulators such as the QCA (i.e. significant recent falls in the 10 year Commonwealth Government bond yield). It specifically provides corroborating evidence on the extent to which the market cost of equity might have changed in recent times.

Grant Samuel finds little evidence based on observed trading multiples over time that the recent falls in Government bond yields have been incorporated into market valuations, which may explain why they (and other independent experts) are reluctant to reflect that in their valuations. For example, Grant Samuel's reports for Novion Proprety Group specifically noted that the repricing of risk can be:

> *"... evidenced through the decline in earnings multiples (relative to the peak in 2007) although it has yet to be translated into the measures of market risk premium (at least those based on longer term historical data)."* [32]

The intent of Grant Samuel's approach appears to be consistent with the other major independent experts.

For example, Deloitte adopted a value for the (equity) MRP which was different from the value adopted for the same parameter in immediately prior expert reports on numerous instances. Similar practices were also adopted by BDO and Lonergan Edwards. Deloitte cites similar reasons as Grant Samuel to explain why it adopted a value of 7.5% for the market risk premium (in its July 2015 report on Energy Developments Limited).[33] Deloitte noted that:

> *"We have considered both the historically observed EMRP and the prospective approaches as a guideline in determining the appropriate EMRP to use in this report. Australian studies on the historical risk premium approach generally indicate that the EMRP would be in the range of 5% to 8%.*
>
> *In recent years it has been common market practice in Australia in expert's reports and regulatory decisions to adopt an EMRP of 6% to 7.5%.*
>
> *The recent severe decline in equity values worldwide and the difficultly companies are experiencing in raising equity capital may be indicative of investors demanding a greater risk premium. In addition, with particular regard to expected future cash flows and observed bond default spreads, current prospective measures appear to indicate an increase in the EMRP.*
>
> *Having considered the various approaches and their limitations, we consider an EMRP of 7.5% to be appropriate."*

Most of the other experts chose to adjust the spot risk free rate as a method to reflect market conditions.

KPMG noted in its assessment of Consolidated Media Holdings that:

> *"Recent market volatility and risk aversion by investors, driven by macro-economic uncertainty, particularly in Europe, has contributed to bond yields trading at historical lows. Further, market evidence indicates that bond yields and the MRP are strongly inversely correlated. In this context, it is important that any assessment of the risk-free rate should be made with respect to the position adopted in deriving the MRP, and there are two relevant options available when undertaking this exercise:*
>
> - *Adopt a historical MRP as a proxy for the expected MRP and adjust the spot risk-free rate to take into account the relationship highlighted above; or*

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[31] Grant Samuel, Independent Expert Report for Novion Property Group: Proposed Merger with Federation Centres, 14 April 2015, page 67

[32] Grant Samuel, Independent Expert Report for Novion Property Group: Proposed Merger with Federation Centres, 14 April 2015, page 68

[33] Deloitte, Independent Expert Report and Financial Services Guide: Energy Developments Limited, 3 September 2015, page 58

- *Adopt the spot risk-free rate and adjust the MRP for the perceived additional risks attaching to equity investments implicit from historically low (or high as the case may be) risk free-rates to reflect the current investment environment and the inverse relationship between the two variables.*

For the purposes of our analysis, we have adopted the former approach and applied a historical estimate of the MRP and adjusted the risk-free rate accordingly."[34]

In its 2015 independent expert report for Straits Resources, BDO noted that:

Commonwealth Treasury bond yields are currently at historically low levels. In our view, the current low yield levels may not persist over the medium to long term.

Having regard to the above, in our view an appropriate risk free rate to use in calculating the cost of equity capital for Straits is the 10 year average of the rate on 10-year Commonwealth Treasury Bonds."[35]

PwC noted that:

"While lower equity market values in recent years reflect investor assessments of likely future cash flows, the current state of equity markets is not consistent with the view that the significantly lower Government Bond rates have fed through into a significantly lower cost of equity. Instead it appears that Government Bond rates in Australia (along with a number of other major markets including the USA and UK) are abnormally low reflecting "flight to quality" among investors in response to global economic uncertainty.

Accordingly, we consider that it is not necessarily appropriate to use the observed spot Government Bond rate in conjunction with the long term estimate of equity market risk premium of 6% for the Australian market at 31 December 2011…

Combining the financial market estimate of inflation of 2.5% and a real risk free rate of 2.5% implies a longer term risk free rate for Australia in the order of 5.1% or 1.4% above the spot Government Bond yield at 31 December 2011.

In terms of adjustment to reflect the abnormally low level of Government Bond yields, this could arguably be made by

- *Adding an amount to the spot measure of Rf*
- *Adjusting the measure of EMRP used to reflect an additional short term component of risk over and above the depressed measure of Rf.*

For the purposes of estimating the cost of equity, we have added an amount to Rf and retained the long term measure of EMRP."[36]

Grant Thornton stated in its report for Rutila Resources Limited that:

"Given the noises nature (sic) around the existing short-term risk free rate, we have placed more emphasis on the risk free rate observed over a longer period of time. Based on the above, we have adopted the risk free rate of 4.07%, which is based on the 5 year average yield on the 10 year Australian Government Bond."[37]

Lonergan Edwards[38] and RSM Bird Cameron[39] also tend to make similar adjustments to the risk free rate.

[34] KPMG, Independent Expert Report, 24 September 2012, Consolidated Media Holdings Limited, 24 September 2012, page 92

[35] BDO, Independent Expert's Report, Straits Resources Limited, 10 November 2015, page 60

[36] PwC, Independent Expert's Report on the proposed merger with Whitehaven Coal Limited, Aston Resources Limited, March 2012, page 88

[37] Grant Thornton, Independent Expert's Report and Financial Services Guide, Rutila Resources Limited, 19 June 2015, page 60

[38] For example, refer to Lonergan Edwards & Associates Limited, Independent Expert's Report, Country Road Group, 21 July 2014, page 56

[39] For example, refer to RSM Bird Cameron, Financial Services Guide and Independent Expert's Report, Otis Energy, November 2014, page 42.

6.4 Formulation of the discount rate and the value of imputation credits

It is evident from the independent expert reports reviewed that the formulation of the discount rate typically applied by independent experts is different to that applied by the QCA. Independent expert reports typically apply a nominal post-tax discount rate, as discussed in Section 4 of this report.

The QCA estimates what is often referred to as a 'vanilla' discount rate. The QCA's approach incorporates a pre-tax cost of debt with a post-tax cost of equity, which effectively means that all tax effects are accounted for within the net cash flows rather than in the discount rate.

It is also evident that in calculating a discount rate, independent experts do not assign a value to imputation credits. Since 1 July 2015, the QCA values imputation credits at 0.47 in their regulatory decisions. Prior to this, imputation credits were valued at 0.50.

The value of imputation credits can be taken into account by adjusting the discount rate applied to net cash flows, or by adjusting the net cash flows (in particular, by adjusting the tax cash flows).[40] The value of imputation credits has the effect of lowering the allowed cost of equity, and therefore the returns to equity holders. This is because:

- Imputation credits reflect the tax credit investors receive from the Government on dividends that have been paid on a franked basis (i.e. taxed at the corporate level). In effect, investors receive a credit against their personal tax liability for the corporate tax that the company has already paid on the dividends
- To the extent that imputation credits have any value to investors, that value will be incorporated into the lower returns investors require from investing in equity (i.e. a lower market cost of equity). This is because investors will receive part of their required return in the form of the tax credit from the government.

To allow an "apples for apples" comparison between the market cost of equity implied from independent expert reports and the QCA's implied market cost of equity, it is therefore necessary to include the difference in the value assigned to imputation credits by independent experts and the QCA.

To estimate the difference in value for the period from 2008 - 2015 I have considered the proportion of the return which the equity holder receives from the government by way of a tax credit as follows:

- The company pays tax (T) at the rate of 30% on each dollar of pre-tax profits. As such it can distribute dividends worth \$1-T to the shareholder
- As the dividends have been subject to corporate tax, the government provides imputation credits of T to the shareholder
- If imputation credits are valued by investors, the credits provided by the government would be worth gT to the investor, where g represents the value of imputation credits
- The shareholder's total return is therefore the sum of the first and third points above or 1-T(1-g). Of this, the proportion provided by the company is (1-t) and the proportion provided by the government (or not required to be provided by the company) is gT.

If the corporate tax rate (i.e. T) is 30% (on average) and the QCA assigns a value of 0.47 (post 1 July 2015) and 0.50 (pre 1 July 2015) to imputation credits (i.e. g), we estimate that the market cost of equity needs to be reduced by around 17% to remove the value that the QCA attributes to imputation credits.

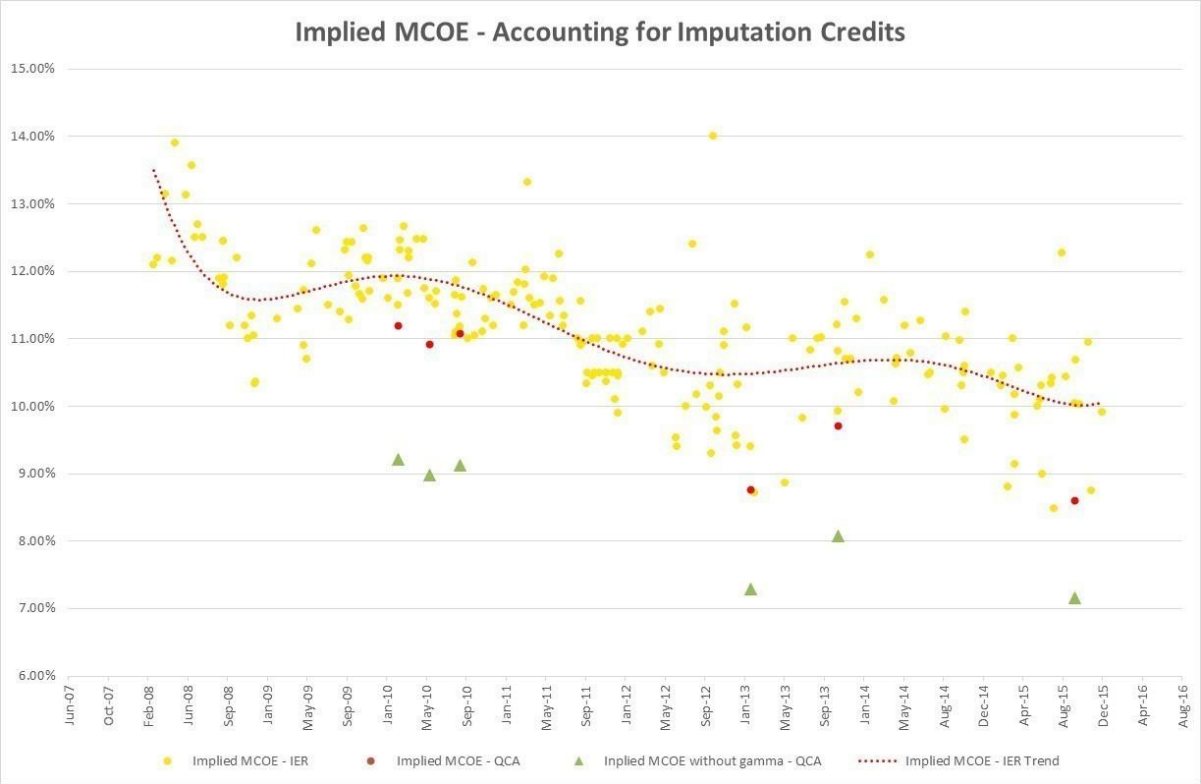
[40] Where the adjustment is made in the net cash flows, it is necessary to use a consistently defined discount rate.

This equates approximately to around 1.7 percentage points percentage points difference in the average market cost equity implied by the QCA determinations and the average implied market cost of equity using the QCA's approach accounting for imputation credits.[41]

This amount should be added to the differences observed in section 6.2 if an appropriate comparison is to be made between the market cost of equity implied from independent expert reports and the market cost of equity implied by applying the QCA's approach.

Figure 5 below illustrates the difference between the IER implied market cost of equity and the QCA implied market cost of equity accounting for the impact of imputation credits. It further highlights the fact that the QCA's market cost of equity is significantly lower than that of the IER.

Figure 5: Implied market cost of equity accounting for imputation credits



6.5 Other issues

As part of this analysis, we also focused on 3 specific aspects of the independent experts' estimation of the market cost of equity.

- Infrastructure sector – has there been any significant trend in the cost of equity or equity betas specifically, as estimated by independent experts over the period?
- Risk free rate – has there been any evidence that independent experts have relied on an approach other than using 10 year Commonwealth Government bonds as a proxy for the risk free rate?
- Imputation credits – has there been any evidence of a consistent trend in relation to the treatment of imputation credits by independent experts, either in general or by particular experts?

[41] In practice, it means that the QCA's implied market cost of equity is, on average, overstated by this amount.

6.5.1 Infrastructure sector

The CONNECT 4 Experts Report database categorises independent expert reports using the Global Industry Classification Standard (GICS), an industry standard developed by MSCI Inc and Standard & Poor's. The GICS does not include a subset for 'infrastructure', so we have instead identified the following GICS industries as a proxy for our purposes:

- Utilities
- Transportation
- Telecommunication.

These are the GICS industries that most closely align with the definition of "infrastructure". However we note that utilities, transportation and telecommunication as defined by the GICS industries do not necessarily reflect the equivalent risk profile of Aurizon.

Based on this definition, we identified 24 independent expert reports in the 'infrastructure' sector[42] out of the 201 that qualified for our review. Between 2008 and 2015, the difference between the market cost of equity as implied by independent experts (11.28%) and the QCA (10.01%) is 1.27 percentage points, only slightly higher than the differential observed in the overall dataset (1.12 percentage points).

6.5.2 Risk free rates

Based on our analysis, the overwhelming majority of independent expert reports relied on 10 year Commonwealth Government bonds as the basis for estimating a proxy for the risk free rate. There were at least five (5) independent expert reports that qualified for our review that relied on other Commonwealth Government bonds as a proxy for the nominal risk free rate of return in their analyses. These were excluded these because this approach was chosen for specific purposes (e.g. the life of the asset relevant to the transaction) and do not provide an appropriate basis for comparison for our purposes.

Most notably, BDO's independent expert report for Signature Capital Investments[43] applied a 5 year risk free rate term to calculate the cost of equity based on the period of Signature's expected investment cash flows, which were not consistent with long term investments. Incenta also omitted BDO's report for Signature Capital Investments as it "is not comparable to those assessing long term investments, which apply a 10 year risk free rate".[44]

Overall, the number of independent expert reports that relied on an approach other than the 10 year Commonwealth Government bonds represents a significant minority (i.e. 2 per cent).

6.5.3 Imputation credits

There is no evidence that market practitioners (i.e. independent experts) take information on imputation credits into account in estimating required rates of returns, as implied by the analysis in Section 6.4. Of the 201 reports we reviewed, we did not identify any reports that aim to account for the value of imputation credits.

Grant Samuel makes no explicit allowance for the impact of Australia's dividend imputation system in its MRP. It specifically states that:

> *"... the evidence gathered to date as to the value of the market attributes to franking credits is insufficient to rely on for valuation purposes. The studies that measure the value attributed to franking credits are based*

[42] Note that this definition of infrastructure based on the GICS industries may include segments of the industry which are not directly comparable to the typical definition of infrastructure for our purposes (e.g. the GICS definition of telecommunications includes companies such as My Net Fone Pty Ltd, an internet service provider).

[43] BDO, Independent Expert's Report for Signature Capital Investments, 8 May 2013

[44] Incenta, Update of evidence on the required return on equity from independent expert reports, May 2014, page 21

on the immediate value of franking credits distributed and do not address the risk and other issues associated with the ability to utilise them over the longer term. More importantly, Grant Samuel does not believe that such adjustments are widely used by acquirers of assets at present."[45]

A similar approach to imputation credits is adopted by Deloitte, BDO and Lonergan Edwards.

Deloitte share a common view across their Independent Expert Reports concluding the following about the impact of dividend imputation:

"We have not adjusted the cost of capital or the projected cash flows for the impact of dividend imputation due to the diverse views as to the value of imputation credits and the appropriate method that should be employed to calculate this value… In our view, the evidence relating to the value that the market ascribes to imputation credits is inconclusive."[46]

In all recent decisions, BDO consistently calculate WACC without adjusting for dividend imputation. Similarly, Lonergan Edwards adopt the following view in their Independent Expert Reports:

"Given free capital flows between developed countries and the small size of the Australian stock market (as a percentage of global markets), the cost of capital of listed companies (other than perhaps regulated infrastructure assets) should be assessed in a global context ignoring Australian imputation. This is the approach generally adopted by independent experts."[47]

Based on this, there is strong evidence that independent experts consistently do not attempt to account for the value of imputation credits.

[45] Grant Samuel, Independent Expert's Report, Asciano, 30 September 2015, page 315

[46] Deloitte, Independent Expert's Report, Energy Developments Limited, 3 September 2015, page 63

[47] Lonergan Edwards, Independent Expert's Report, iiNet, 10 June 2015, page 102

7. Other evidence

This section presents some other evidence relevant to the conclusions drawn in Section 6. In particular, it:

- Summarises the conclusions of other similar studies a number of which have been undertaken
- Examines at the evidence of what other regulators are doing in the current market environment.

7.1 Other studies of the cost of equity

There have a number of similar studies undertaken on how independent experts have estimated the cost of equity. The public studies include:

- EY (2012)[48]
- SFG (2013)[49]
- Incenta (2014)[50]
- Incenta (2015).[51]

According to these studies, it is clear that the approach taken by independent experts to estimate the components of the cost of equity differs from that taken by regulators such as the Australian Energy Regulator (AER). In particular, independent experts blend financial theory, market data, market knowledge and other information, to inform the way they apply models such as the CAPM. They do not apply such models in the way the AER does.

As shown in EY (2012), SFG (2013), Incenta (2014) and Incenta (2015), and summarised below, this fundamental difference in their approach is clearly reflected in the estimates of the market cost of equity implied by independent experts, as compared with using the AER's approach.

Table 8: Summary of findings from previous reports

Non-asset specific uplifts made to overall WACC or cost of equity			
Study	Period covered	AER Implied market cost of equity	Expert implied market cost of equity
EY (2012)	1 Jan 08 – 10 Oct 12	9.5%	10.7%
SFG (2013)	10 Oct 12 – 26 Apr 13	8.5%	10.2% to 11.6%
Incenta (2014)	27 Apr 13 – 20 Apr 14	10.2%	12.2%
Incenta (2015)	21 Apr 14 – 31 Jan 15	10.1%	10.5%

Note: All figures do not adjust for imputation credits

This shows that there continues to be material differences in the market cost of equity estimated by independent experts and implied using the regulator's approach (in this case, the AER).

The above findings do not capture direct adjustments made by the independent expert to the risk free rate (as identified in Figure 4 of this report). Our analysis indicates that direct adjustments to the risk free rate ranging from an uplift of 75 basis points to 267 basis points over the spot risk free rate, were made in 12 independent expert reports in 2015.

[48] EY, Market evidence on the cost of equity: Victorian Gas Access Arrangement Review 2013-2017, 8 November 2012

[49] SFG, Evidence on the required return on equity from independent expert reports: Report for the Energy Networks Association, June 2013

[50] Incenta, Update of evidence on the required return on equity from independent expert reports, May 2014

[51] Incenta, Further update on the required return on equity from independent expert reports, Jemena Gas Networks, Jemena Electricity Networks, ActewAGL, Ausgrid, AusNet Services, Australian Gas Networks, Citipower, Endeavor Energy, Energex, Ergon, Essential Energy, Powercor, SA PowerNetworks and United Energy, February 2015.

These findings confirm that applying the CAPM in a mechanistic way will lead to MCOE estimates (and most likely discount rate and rate of return estimates) that are out of line with the overall views of independent experts. To the extent that independent expert views are more consistent with the broader views of market practitioners, which we believe is likely to be the case, the mechanistic application of the CAPM will result in regulated businesses being denied the opportunity to recover a reasonable allowance for their required return on capital.

This is even before an increment is added to the independent expert values to allow for the value that regulators ascribe to imputation credits, as discussed in Section 6.4 of this report and noted by both SFG and Incenta in their previous studies.

Appendix A Reports analysed for cost of equity

Company Name	Independent Expert	Expert Report Date	Independent Expert Market Cost of Equity (A)	QCA's Implied Cost of Equity (B)	Difference (A – B)
CMI Ltd	InterFinancial	20/02/2008	12.10%	12.54%	-0.44%
Anzon Energy Ltd	Deloitte	3/03/2008	12.20%	12.62%	-0.42%
Olympia Resources Ltd	BDO	26/03/2008	13.14%	12.26%	0.88%
Austral Gold Ltd	InterFinancial	15/04/2008	12.15%	12.12%	0.03%
CBD Energy Ltd	VMC Global	24/04/2008	13.91%	12.19%	1.72%
DoloMatrix International Ltd	PKF	26/05/2008	13.13%	12.34%	0.79%
Bemax Resources Ltd	Lonergan & Edwards	26/05/2008	13.57%	12.65%	-0.01%
Sydney Gas Ltd	Grant Thornton	23/06/2008	12.50%	12.76%	-0.26%
ARC Energy Ltd	Deloitte	30/06/2008	12.70%	12.77%	-0.07%
Macquarie Capital Alliance Group	Deloitte	16/06/2008	12.50%	12.62%	-0.12%
Anzon Australia Ltd	KPMG	16/06/2008	11.90%	11.68%	0.22%
Origin Energy Ltd	Grant Samuel	15/09/2008	11.80%	11.63%	0.18%
CMI Ltd	InterFinancial	17/09/2008	12.45%	11.59%	0.86%
ERG Ltd	Ernst & Young	17/09/2008	12.45%	11.59%	0.86%
Sunshine Gas Ltd	Deloitte	20/08/2008	11.91%	11.56%	-0.04%
Portman Ltd	KPMG	11/09/2008	11.20%	11.37%	-0.17%
Grange Resources Ltd	Lonergan & Edwards	28/10/2008	12.20%	10.74%	1.46%
Mount Gibson Iron Ltd	KPMG	21/11/2008	11.20%	10.31%	0.89%
Babcock & Brown Communities Group	Deloitte	28/11/2008	11.00%	10.12%	0.88%
Australian Zircon NL	BDO	10/12/2008	11.34%	9.85%	1.49%
Pacific Energy Ltd	BDO	16/12/2008	11.05%	9.75%	1.30%
Gindalbie Metals Ltd	Deloitte	19/12/2008	10.33%	9.68%	0.65%
Perilya Ltd	Ernst & Young	24/12/2008	10.37%	9.63%	0.74%
Hutchison Telecommunications (Australia) Ltd	Lonergan & Edwards	26/02/2009	11.30%	9.32%	1.98%
Macquarie Communications Infrastructure Group	Deloitte	31/03/2009	11.44%	9.78%	1.66%
Consolidated Rutile Ltd	Ernst & Young	17/04/2009	11.72%	9.92%	1.80%
Gloucester Coal Ltd	PwC	18/05/2009	10.90%	9.92%	0.98%
Dioro Exploration NL	KPMG	27/05/2009	10.70%	10.15%	0.55%
Olympia Resources Ltd	BDO	11/06/2009	12.11%	10.44%	1.67%
Macquarie Leisure Trust Group	Lonergan & Edwards	25/06/2009	12.60%	10.72%	1.88%
CBH Resources Ltd	Grant Thornton	31/07/2009	11.50%	10.92%	0.58%
Macquarie Airports	KPMG	4/09/2009	11.40%	11.15%	0.25%
CMI Ltd	InterFinancial	18/09/2009	12.32%	11.03%	1.29%
Warwick Resources Ltd	BDO	8/09/2009	12.43%	10.99%	1.44%
Felix Resources Ltd	Deloitte	30/09/2009	11.94%	10.97%	0.97%
eBet Ltd	Grant Thornton	2/10/2009	11.28%	10.96%	0.32%
WebSpy Ltd	BDO	9/10/2009	12.43%	10.95%	1.48%
WestSide Corporation Ltd	Deloitte	20/10/2009	11.78%	11.09%	0.69%
Lend Lease Primelife Group	Deloitte	28/09/2009	11.66%	11.28%	1.02%

Company Name	Independent Expert	Expert Report Date	Independent Expert Market Cost of Equity (A)	QCA's Implied Cost of Equity (B)	Difference (A – B)
Macquarie Media Group	Ernst & Young	28/10/2009	11.59%	11.31%	0.28%
Moly Mines Ltd	BDO	13/11/2009	12.63%	11.30%	1.33%
United Minerals Corporation NL	Deloitte	16/10/2009	12.20%	11.25%	0.95%
Fox Invest Ltd	BDO	25/11/2009	12.16%	11.16%	1.00%
IOR Group Ltd	Deloitte	30/11/2009	12.20%	11.11%	1.09%
Drummond Gold Ltd	InterFinancial	30/11/2009	11.70%	11.07%	0.63%
Alinta Energy Group	Grant Samuel	12/01/2010	11.90%	11.06%	0.84%
Dioro Exploration NL	KPMG	28/01/2010	11.60%	11.12%	0.48%
CBH Resources Ltd	Grant Thornton	26/02/2010	11.50%	10.94%	0.56%
Macarthur Coal Ltd	Lonergan & Edwards	26/02/2010	11.90%	10.94%	0.96%
Gloucester Coal Ltd	Deloitte	3/03/2010	12.31%	10.96%	1.35%
Victoria Petroleum NL	Deloitte	5/03/2010	12.46%	10.97%	1.49%
Seven Network Ltd [The]	Deloitte	22/02/2010	12.67%	11.05%	1.05%
CBH Resources Ltd	Grant Thornton	26/02/2010	11.67%	11.16%	0.51%
KFM Diversified Infrastructure and Logistics Fund	Deloitte	29/03/2010	12.30%	11.18%	1.12%
Entellect Solutions Ltd	RSM Bird Cameron	30/03/2010	12.20%	11.21%	0.99%
Consolidated Media Holdings Ltd	Deloitte	23/04/2010	12.47%	11.40%	1.07%
CVC Property Fund	Haines Norton	14/05/2010	12.48%	11.32%	1.16%
CBH Resources Ltd	Grant Thornton	27/04/2010	11.75%	11.31%	0.44%
Arrow Energy Ltd	Deloitte	2/06/2010	11.60%	11.00%	0.60%
Gloucester Coal Ltd	Deloitte	19/06/2010	11.51%	10.87%	0.64%
Jupiter Mines Ltd	Ernst & Young	22/06/2010	11.70%	10.88%	0.82%
Centennial Coal Company Ltd	Ernst & Young	16/08/2010	11.05%	10.72%	0.33%
iiNet Ltd	Lonergan & Edwards	18/08/2010	11.64%	10.71%	0.93%
Australian Power and Gas Company Ltd	Grant Thornton	19/08/2010	11.10%	10.70%	0.40%
Healthscope Ltd	Grant Samuel	20/08/2010	11.86%	10.69%	0.51%
Gloucester Coal Ltd	Deloitte	24/08/2010	11.37%	10.66%	0.71%
Mosaic Oil NL	PwC	1/09/2010	11.18%	10.56%	0.62%
Nullarbor Holdings Ltd	Hallchandwick	7/09/2010	11.61%	10.52%	1.09%
Prime Infrastructure Group	Grant Samuel	24/09/2010	11.00%	10.69%	0.31%
Mako Energy Ltd	RSM Bird Cameron	8/11/2010	12.13%	10.87%	1.26%
Intoll Group	Ernst & Young	14/10/2010	11.05%	10.89%	0.16%
MAC Services Group Ltd [The]	Grant Samuel	9/11/2010	11.10%	11.00%	0.10%
Copper Strike Ltd	RSM Bird Cameron	11/11/2010	11.73%	11.03%	0.70%
Northern Energy Corporation Ltd	Lonergan & Edwards	17/11/2010	11.30%	11.08%	0.22%
Sigma Pharmaceuticals Ltd	Deloitte	3/12/2010	11.60%	11.17%	0.43%
Dominion Mining Ltd	KPMG	9/12/2010	11.20%	11.17%	0.03%
Engin Ltd	Lonergan & Edwards	20/12/2010	11.64%	11.21%	0.43%
Alinta Energy Group	Grant Samuel	1/02/2011	11.50%	11.19%	0.31%
ING Industrial Fund	Deloitte	10/02/2011	11.69%	11.24%	0.45%
White Energy Company Ltd	Deloitte	22/02/2011	11.84%	11.28%	0.56%
Tower Australia Group Ltd	Lonergan & Edwards	11/03/2011	11.20%	11.24%	-0.04%

Company Name	Independent Expert	Expert Report Date	Independent Expert Market Cost of Equity (A)	QCA's Implied Cost of Equity (B)	Difference (A – B)
RHG Ltd	Deloitte	16/03/2011	11.80%	11.19%	0.61%
Rialto Energy Ltd	RSM Bird Cameron	18/03/2011	12.02%	11.16%	0.86%
Mintails Ltd	Hallchandwick	24/03/2011	13.32%	11.12%	2.20%
Redflex Holdings Ltd	Lonergan & Edwards	31/03/2011	11.60%	11.09%	0.51%
Spark Infrastructure Group	Lonergan & Edwards	13/04/2011	11.50%	11.12%	0.38%
Gloucester Coal Ltd	Deloitte	16/05/2011	11.53%	11.19%	0.34%
Copper Strike Ltd	RSM Bird Cameron	14/05/2011	11.92%	11.18%	0.74%
Engin Ltd	Lonergan & Edwards	1/06/2011	11.34%	11.07%	0.27%
Cellestis Ltd	Deloitte	10/06/2011	11.90%	10.99%	0.61%
Global Petroleum Ltd	BDO	28/06/2011	12.26%	10.83%	1.43%
QMASTOR Ltd	BDO	20/07/2011	11.56%	10.81%	0.75%
Centrebet International Ltd	Lonergan & Edwards	8/07/2011	11.20%	10.77%	0.43%
Qube Logistics	Deloitte	11/07/2011	11.34%	10.76%	0.58%
ConnectEast Group	Deloitte	22/08/2011	11.00%	10.06%	0.94%
Telstra Corporation Ltd	Grant Samuel	31/08/2011	11.56%	9.88%	1.32%
Mikoh Corporation Ltd	RSM Bird Cameron	1/09/2011	10.90%	9.86%	1.04%
Copper Strike Ltd	RSM Bird Cameron	6/09/2011	10.93%	9.85%	1.08%
Northern Energy Corporation Ltd	Deloitte	19/09/2011	10.33%	9.78%	0.55%
Eastern Star Gas Ltd	Grant Samuel	22/09/2011	10.50%	9.76%	0.74%
Centro Retail Group	Grant Samuel	29/09/2011	11.00%	9.47%	1.53%
Centro Properties Group	Grant Samuel	5/10/2011	11.00%	9.67%	1.33%
Bondi Mining Ltd	InterFinancial	7/10/2011	10.45%	9.66%	0.79%
Oceania Capital Partners Ltd	Deloitte	10/10/2011	10.50%	9.66%	0.84%
Coal & Allied Industries Ltd	Lonergan & Edwards	21/10/2011	11.00%	9.79%	1.21%
Fosters Group Ltd	Grant Samuel	26/10/2011	10.50%	9.84%	0.66%
Wentworth Holdings Ltd	Leadenhall	15/11/2011	10.50%	9.81%	0.69%
Bow Energy Ltd	Grant Samuel	16/11/2011	10.50%	9.79%	0.71%
Syngas Ltd	Grant Thornton	17/11/2011	10.36%	9.76%	0.60%
AUSTAR United Communications Ltd	Grant Samuel	8/12/2011	10.50%	9.33%	1.17%
Brockman Resources Ltd	Deloitte	14/12/2011	10.10%	9.27%	0.83%
Living and Leisure Australia Group	Grant Thornton	20/12/2011	11.00%	9.22%	1.78%
DoloMatrix International Ltd	Lonergan & Edwards	22/12/2011	10.50%	9.23%	1.27%
Murchison Metals Ltd	KPMG	23/12/2011	9.90%	9.23%	0.67%
My Net Fone Ltd	Leadenhall	23/12/2011	10.44%	9.23%	0.77%
KIP McGrath Education Centres Ltd	Crowe Horwath	5/01/2012	10.91%	9.23%	1.68%
oOh!media Group Ltd	Grant Thornton	20/01/2012	11.00%	9.28%	1.72%
Aston Resources Ltd	PwC	6/03/2012	11.10%	9.67%	1.43%
CMI Ltd	Lonergan & Edwards	29/03/2012	11.40%	9.71%	0.79%
Ludowici Ltd	Grant Thornton	3/04/2012	10.60%	9.68%	0.92%
ING Real Estate Community Living Group	Deloitte	24/04/2012	10.92%	9.42%	1.50%
Gloucester Coal Ltd	Deloitte	26/04/2012	11.44%	9.39%	2.05%
Nexbis Ltd	Grant Thornton	9/05/2012	10.50%	9.11%	1.39%
Genesis Resources Ltd	RSM Bird Cameron	13/06/2012	9.54%	8.43%	1.11%

Company Name	Independent Expert	Expert Report Date	Independent Expert Market Cost of Equity (A)	QCA's Implied Cost of Equity (B)	Difference (A – B)
Spotless Group Ltd	Grant Samuel	15/06/2012	9.40%	8.41%	0.59%
Norton Gold Fields Ltd	Grant Thornton	13/07/2012	10.00%	8.47%	1.53%
Hastings Diversified Utilities Fund	Grant Samuel	3/08/2012	12.40%	8.40%	0.60%
Westgold Resources Ltd	BDO	16/08/2012	10.18%	8.62%	1.56%
Arafura Resources Ltd	BDO	13/09/2012	9.99%	8.65%	1.34%
Consolidated Media Holdings Ltd	KPMG	24/09/2012	10.30%	8.62%	1.68%
Bremer Park Ltd	Moore Stephens	28/09/2012	9.30%	8.61%	0.69%
Duet Group	Grant Samuel	3/10/2012	14.00%	8.60%	0.40%
MediVac Ltd	RSM Bird Cameron	12/10/2012	9.84%	8.56%	1.28%
Pluton Resources Ltd	BDO	17/10/2012	9.63%	8.52%	1.11%
Focus Minerals Ltd	BDO	23/10/2012	10.15%	8.51%	1.64%
Stanmore Coal Ltd	Lonergan & Edwards	25/10/2012	10.50%	8.53%	1.97%
CGA Mining Ltd	BDO	5/11/2012	10.90%	8.60%	1.51%
Integra Mining Ltd	Ernst & Young	7/11/2012	11.11%	8.62%	2.49%
Cortona Resources Ltd	BDO	14/11/2012	9.41%	8.72%	0.69%
Australian Infrastructure Fund	Grant Samuel	7/12/2012	11.51%	8.68%	0.52%
Realm Resources Ltd	RSM Bird Cameron	11/12/2012	9.56%	8.68%	0.88%
Wentworth Holdings Ltd	Leadenhall	17/12/2012	10.32%	8.73%	1.59%
Macmahon Holdings Ltd	Ernst & Young	14/01/2013	11.17%	8.85%	2.32%
Endocoal Ltd	Ernst & Young	25/01/2013	9.40%	8.84%	0.56%
YTC Resources Ltd	BDO	5/02/2013	8.72%	8.87%	1.35%
Coalspur Mines Ltd	BDO	7/05/2013	8.86%	8.75%	0.11%
Polymetals Mining	Grant Thornton	31/05/2013	11.00%	8.68%	2.32%
Elemental Minerals	BDO	1/07/2013	9.82%	8.83%	0.99%
ILH Group	DMR Corporate	13/10/2014	10.83%	8.92%	1.91%
Australian Power and Gas	Grant Thornton	13/08/2013	11.00%	8.82%	2.19%
Gujarat NRE Coking Coal Ltd	BDO	26/08/2013	11.02%	8.88%	0.84%
Clough	Grant Samuel	11/10/2013	11.21%	9.09%	0.91%
Spencer Resources	Leadenhall	13/11/2013	9.93%	9.09%	0.84%
Australasian Wealth Investments	BDO	14/10/2013	10.81%	9.09%	1.72%
RHG	Deloitte	5/11/2013	11.55%	9.18%	1.82%
Cockatoo Coal	Grant Thornton	8/11/2013	10.70%	9.19%	1.52%
Blackwood	Grant Thornton	25/11/2013	10.70%	9.22%	1.48%
Greencross Limited	Deloitte	11/12/2013	11.30%	9.26%	2.04%
FRR Corporation Ltd	Leadenhall	17/12/2013	10.21%	9.24%	0.97%
CFX Retail Property Trust	Grant Samuel	7/02/2014	12.24%	9.18%	0.92%
Envestra	Grant Samuel	4/03/2014	11.58%	9.18%	1.02%
Wolf Minerals	BDO	2/04/2014	10.07%	9.21%	0.85%
TriAusMin	Value Adviser	9/04/2014	10.62%	9.23%	1.39%
Westfield	Grant Samuel	11/04/2014	10.71%	9.23%	0.77%
Nexus Energy Ltd	Deloitte	5/05/2014	11.19%	9.18%	2.01%
David Jones Ltd	Grant Samuel	22/05/2014	10.79%	9.06%	0.94%
Aquila Resources	Grant Samuel	20/06/2014	11.26%	8.99%	0.71%
Gondwana Resources Ltd	BDO	16/07/2014	10.47%	8.83%	1.64%
Country Road Ltd	Lonergan & Edwards	21/07/2014	10.50%	8.80%	1.70%
Armidale Investment Corporation Ltd	Titan Partners	2/09/2014	9.95%	8.78%	1.17%
Wotif.com Holdings Ltd	Grant Samuel	5/09/2014	11.03%	8.79%	0.71%
MDS Financial Group Ltd	William Buck	17/10/2014	10.97%	8.81%	2.16%

Company Name	Independent Expert	Expert Report Date	Independent Expert Market Cost of Equity (A)	QCA's Implied Cost of Equity (B)	Difference (A – B)
Solco Ltd	Crowe Horwath	24/10/2014	10.30%	8.74%	1.56%
Nexus Energy Ltd	Lonergan & Edwards	30/10/2014	10.50%	8.72%	1.78%
Arena REIT	KPMG	3/11/2014	10.60%	8.70%	1.90%
Empire Oil and Gas NL	KPMG	3/11/2014	9.50%	8.70%	0.80%
Otis Energy Ltd	RSM Bird Cameron	6/11/2014	11.40%	8.69%	2.71%
Medibio Limited	Grant Thornton	22/01/2015	10.50%	8.20%	2.30%
Macquarie Radio Network	Grant Thornton	19/02/2015	10.30%	8.00%	2.30%
Coalspur Mines Ltd	BDO	26/02/2015	10.45%	7.95%	1.30%
CIC Australia Limited	BDO	13/03/2015	8.81%	7.95%	0.86%
Warrnambool Cheese and Butter Factory	Grant Thornton	26/03/2015	11.00%	7.92%	3.08%
TOLL	Grant Samuel	1/04/2015	9.15%	7.89%	0.61%
Norton Gold Fields Ltd	Deloitte	2/04/2015	9.87%	7.88%	1.99%
PAYCE Consolidated Ltd	HanrickCurran	2/04/2015	10.17%	7.88%	2.29%
Novion	Grant Samuel	14/04/2015	10.56%	7.83%	0.49%
iiNet Ltd	Lonergan & Edwards	10/06/2015	10.00%	8.16%	1.84%
Rutila Resources	Grant Thornton	19/06/2015	10.10%	8.14%	1.96%
Prima Biomed Ltd	KPMG	22/06/2015	10.30%	8.14%	2.16%
Evolution Mining Ltd	EY	23/06/2015	9.00%	8.14%	0.86%
Skilled Group	Grant Samuel	24/06/2015	12.27%	8.03%	0.77%
Energy Developments	Deloitte	20/07/2015	10.33%	8.63%	1.70%
Flinders Mines	Deloitte	24/07/2015	10.42%	8.60%	1.82%
Sirius Resources	BDO	29/07/2015	8.48%	8.58%	1.33%
Phoenix Gold Limited	BDO	2/09/2015	10.44%	8.48%	1.96%
Asciano	Grant Samuel	29/09/2015	10.05%	8.49%	0.31%
Armour Energy	BDO	2/10/2015	10.68%	8.50%	2.18%
Millenmium Minerals Limited	Grant Thornton	14/10/2015	10.03%	8.50%	1.53%
Straits Resources Limited	BDO	10/11/2015	10.95%	8.48%	2.47%
Naracoota Resources Limited	BDO (relying on Valutech)[52]	18/11/2015	8.75%	8.57%	0.18%
Polynovo Ltd	Education & Management Consulting Services	21/12/2015	9.91%	8.71%	1.20%
	AVERAGE		11.12%	9.99%	1.12%

[52] BDO produced this independent expert report but relied on Valutech to undertake the discount rate assessment which was used as an input into BDO's work.

Appendix B Adjustments made by independent experts

Direct adjustments to the risk free rate

Company name	Independent expert	Expert report date	Risk free rate applied	Spot risk free rate	Direct adjustment to risk free rate	Midpoint MRP	Expert's calculated market cost of equity (midpoint)	Market cost of equity – QCA's approach
Medibio Ltd	Grant Thornton	22/02/2015	4.50%	2.60%	+1.90%	6.00%	10.50%	8.70%
Macquarie Radio Network	Grant Thornton	19/02/2015	4.30%	2.55%	+1.75%	6.00%	10.30%	8.50%
Warrnambool Cheese and Butter Factory	Grant Thornton	26/03/2015	5.00%	2.33%	+2.67%	6.00%	11.00%	8.42%
Payce Consolidated Ltd	HanrickCurran	2/04/2015	4.17%	2.30%	+1.87%	6.00%	10.17%	8.38%
iiNet Ltd	Lonergan & Edwards	10/06/2015	4.00%	3.05%	+0.95%	6.00%	10.00%	8.66%
Rutila Resources Ltd	Grant Thornton	19/06/2015	4.10%	2.88%	+1.22%	6.00%	10.10%	8.64%
Prima Biomed	KPMG	22/06/2015	4.30%	2.95%	+1.35%	6.00%	10.30%	8.64%
Evolution Mining	EY	23/06/2015	4.25%	3.00%	+1.25%	6.00%	11.85%	8.64%
Phoenix Gold	BDO	2/09/2015	3.44%	2.69%	+0.75%	7.00%	10.44%	8.48%
Armour Energy Ltd	BDO	2/10/2015	4.68%	2.62%	+2.06%	6.00%	10.68%	8.50%
Millennium Minerals Ltd	Grant Thornton	14/10/2015	4.03%	2.59%	+1.44%	6.00%	10.03%	8.50%
Straits Resources	BDO	10/11/2015	4.70%	2.89%	+1.81%	6.00%	10.95%	8.48%
Average			4.29%	2.71%	+1.59%	6.09%	10.40%	8.55%

Source: EY Analysis

Non-asset specific uplifts made at the overall WACC or cost of equity level

Company name	Independent expert	Expert report date	Risk free rate applied	Midpoint MRP	WACC uplift	Midpoint gearing	Cost of equity uplift	Expert's Implied market cost of equity	Market cost of equity – QCA's approach
Toll Holdings Ltd	Grant Samuel	1/04/2015	2.50%	6.00%	0.50%	23%	0.65%	9.15%	8.39%
Novion	Grant Samuel	14/04/2015	2.32%	6.00%	1.85%	18%	2.24%	10.56%	8.33%
Skilled Group Ltd	Grant Samuel	24/06/2015	2.80%	6.00%	2.60%	25%	3.47%	12.27%	8.53%
Asciano – Pacific National	Grant Samuel	29/09/2015	2.80%	6.00%	1.00%	20%	1.25%	10.05%	8.49%
Average			2.67%	6.00%	1.46%	20.2%	1.84%	10.51%	8.44%

Source: EY Analysis

Note:

1. Uplifts exclude rounding adjustments, which are defined as adjustments of 25 basis points or less
2. Uplifts were observed for Coalspur Mines and CIC Australia however the relevant expert reports indicated that this was to account for project-specific risk

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