Review of the WACC for Gladstone Area Water Board

A report prepared in the context of GAWB's 2020-25 regulatory period

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Executive Summary

Synergies Economic Consulting (Synergies) has been engaged by Gladstone Area Water Board (GAWB) to establish the weighted average cost of capital (WACC) that it should apply for the 2020-25 regulatory period.

GAWB's overall approach to proposing a WACC for the 2020-25 regulatory period is to adopt a reasonable commercial position, including having regard to the price impacts of its proposed WACC estimate. This overall approach has entailed Synergies and GAWB undertaking a 'ground-up' review of each WACC parameter's estimation methodology having regard to the Queensland Competition Authority's (QCA's) approaches in its recent decisions and the approach taken by the QCA in its 2015 WACC review for GAWB. A summary of our positions on key WACC input parameter estimates is as follows.

Capital structure

Based on our analysis of listed comparators and relevant regulatory decisions, we have retained the current assumption of 50% for GAWB's gearing ratio. This ratio is the same as the QCA's 2015 WACC review for GAWB. It is lower than the 60% gearing assumption currently adopted for Seqwater, reflecting GAWB's concentrated and predominantly industrial customer base.

Return on equity

We have calculated the return on equity using the Sharpe-Lintner Capital Asset Pricing Model (SL CAPM) consistent with the QCA's current practice. This requires estimates of the risk-free rate, market risk premium and beta.

Risk-free rate

Consistent with the long-term time horizon of infrastructure investment, we have calculated the risk-free rate based on a 10-year term to maturity. Based on a 20-day average to 30 August 2019, the risk-free rate is 0.94%, a historical low. This is also the approach adopted by the QCA in its 2019 draft decision for Queensland Rail.

Market risk premium

We have applied a market risk premium (MRP) of 7.0% for GAWB's WACC estimate. In our view, the application of the QCA's current range of approaches and weightings results in too low an estimate of the MRP, especially given the substantial decrease in the risk-free rate and the relatively low weight assigned to the Wright MRP estimation

methodology. In addition, the current MRP estimate using the QCA's preferred Cornell Dividend Growth Model (DGM) is well below DGM estimates generated by other Australian regulators.

Beta

We have adopted an asset beta of 0.45 for GAWB. This corresponds to an equity beta of 0.73 assuming the QCA's debt beta assumption of 0.12 and a gearing ratio of 50%. This is an increase from the asset beta of 0.40 in the QCA's 2015 WACC review for GAWB and is supported by empirical evidence we have gathered from listed entities. Given the industrial nature of GAWB's largest customers, we have supplemented the listed comparator set of water utilities with four mining and industrial services companies.

Considering that the QCA applies an asset beta of 0.41 for Seqwater, our first principles analysis indicates that GAWB's concentrated customer base and industrial exposure leads to higher systematic risk, and thus 0.45 denotes a lower bound for the asset beta.

Return on debt

We have calculated the return on debt using the on-the-day approach. Our estimate has been calculated using RBA and Bloomberg data, consistent with the QCA's approach in its 2019 draft decision for Queensland Rail. As at 30 August 2019, the on-the-day return on debt estimate is 3.10%.

Despite using the on-the-day approach for this 2020 price review, we consider that it is open to GAWB to use the trailing average approach to estimate the return on debt under its price monitoring framework at some future point.

Gamma

We have identified several concerns regarding the QCA's approach to estimating both the distribution rate and theta components of gamma, which should be considered as part of GAWB's 2020 price review. However, in developing a preliminary WACC estimate for GAWB, we have applied the QCA's existing methodology used in the Aurizon Network UT5 2018 final decision and Queensland Rail 2019 draft decision. This results in a current gamma estimate of 0.484.

Preliminary WACC estimate for GAWB

Based on the parameter assumptions above, our preliminary post-tax nominal vanilla WACC (WACC3) estimate for GAWB is 4.57%. This is considerably lower than the WACC of 5.41% approved by the QCA in the 2015 final decision for GAWB and used to

set prices commencing 1 July 2015. This largely reflects decreases in market parameters, particularly the risk-free rate, which flows through to both the return on equity and debt estimates.

Our preliminary WACC estimate will need to be updated to reflect changes in market parameter values close to the commencement of GAWB's 2020-25 regulatory period.

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1 Introduction

Synergies Economic Consulting (Synergies) has been engaged by Gladstone Area Water Board (GAWB) to review the weighted average cost of capital (WACC) that it should apply for the 2020-2025 regulatory period.

With GAWB's assistance we have undertaken a 'ground-up' review of each WACC parameter's estimation methodology having regard to QCA approaches in its recent decisions and the approach taken by the QCA in its 2015 WACC review for GAWB.

Based on this detailed review, Synergies recommends two changes to the QCA's current approaches to determining GAWB's firm-specific parameters and market-wide parameters.

Specifically, for the asset beta component of the return on equity, we share GAWB's concern that the QCA's approved estimate of 0.40 in its 2015 WACC review is too low. We provide supporting arguments in Chapter 3 of our report for an increase in this estimate to at least 0.45.

For the market risk premium (MRP), we consider that the QCA's current assumption of 6.5% (assuming a 10-year risk-free rate) taken from the Queensland Rail 2019 draft decision results in an inadequate return on equity when combined with a risk-free rate that is currently at historically low levels. Based on our analysis, we recommend an MRP of at least 7.0%, with increasing weight given to the Wright MRP methodology.

The rest of this report is structured as follows:

- Chapter 2 – discusses GAWB's capital structure.
- Chapter 3 – calculates GAWB's return on equity (including the risk-free rate, market risk premium and beta).
- Chapter 4 – estimates the return on debt.
- Chapter 5 – considers the value of imputation credits (gamma).
- Chapter 6 – presents our preliminary WACC estimate for GAWB.

2 Capital structure

The purpose of this section is to identify an appropriate long-term benchmark gearing ratio for GAWB based on domestic and international entities with comparable risks and having regard to relevant regulatory precedent.

In a perfect capital market, finance theory provides that the valuation of a firm is unaffected by its capital structure. However, in practice, the assumptions underpinning a perfect capital market do not hold and as such capital structure can have valuation impacts. Clearly, this is relevant to a consideration of the capital structure applying to GAWB.

The assessment of capital structure (or gearing) in the WACC calculation is therefore based on an assessment of an 'optimal' long-term target capital structure for GAWB given its risk profile and the industry within which it operates. In practice, we see numerous and sometimes disparate factors affecting the capital structure adopted by firms within the same industry (for example, different financing strategies, investment needs, owner preferences, tax treatments).

Of all the WACC parameters, determining the optimal benchmark capital structure is especially imprecise. In theory, we would expect to observe the gearing levels of firms in the same industry to cluster within a range, although in practice this range is often very wide, spanning 50% or more of the possible range. However, the capital structure assumption is based on establishing what the maximum efficient long-term gearing level for the business is likely to be. It is not based on the firm's actual gearing. This ensures that the firm is not rewarded for maintaining an inefficient capital structure.

Over time, we tend not to observe material changes in benchmark gearing levels, particularly for utilities. We begin by looking at evidence from comparable entities followed by relevant regulatory precedent.

2.1 Comparable listed companies

Although our beta analysis in Chapter 3 draws on water utilities and mining and industrial services companies given GAWB's customer base, for gearing purposes we consider it is sufficient to focus solely on water utilities. This is because while mining and industrial services companies that are supplied by GAWB are relevant for establishing GAWB's exposure to systematic risk, they are less relevant for establishing an appropriate gearing ratio, as water utilities have different investment requirements owing to their substantial infrastructure component.

In Table 1, gearing levels for the listed comparator set of water utilities range from 14% to 71%. The average and median gearing ratio is 39%. Further discussion of the comparator set is provided in Chapter 3.

Table 1 Listed water utilities gearing summary

Company	5 year gearing estimate
United Utilities Group PLC	54%
Severn Trent PLC	50%
Pennon Group PLC	44%
Aqua America Inc	26%
Cia de Saneamento Basico do Estado de Sao Paulo (SABESP)	38%
Aguas Andinas	26%
Companhia de Saneamento do Parana	39%
TTW PCL	14%
China Water Affairs Group Limited	45%
Kangda International Environmental Co., Ltd.	71%
AS Tallinna Vesi	18%
Average	39%
Median	39%
Minimum	14%
Maximum	71%

Note: The gearing estimates presented here are based on the ratio of net debt to the market value of equity and are expressed in terms of debt-to-value ratios.

Source: Bloomberg, Synergies' calculations

2.2 Regulatory precedent

Table 2 below shows that 60% is the most frequently applied gearing ratio in Australian regulatory decisions for water utilities. There are two exceptions to this.

First, the QCA has previously adopted a gearing ratio of 50% for GAWB, in part due to the concentrated nature of its customer base and associated demand (see first principles analysis in Section 3.3.3 of this report) and its dependence on a single catchment, which result in GAWB having an elevated risk profile relative to Seqwater (which has a QCA-approved gearing ratio of 60% for regulatory purposes).

Second, the ERA applied a gearing ratio of 55% in its inquiry into efficient costs and tariffs for the Water Corporation, Aqwest and Busselton Water in 2017, based on updated evidence from listed comparators.

Table 2 Recent Australian regulatory gearing decisions for water utilities

Water utility	Regulator	Year	Gearing ratio
Gladstone Area Water Board (GAWB)	QCA	2015	50%
Seqwater	QCA	2018	60%
Various NSW water utilities	IPART	2018	60%
TasWater	OTTER	2018	60%
Water Corporation, Aqwest and Busselton Water	ERA	2017	55%
Melbourne Water	ESC	2016	60%
Goulburn-Murray Water	ESC	2016	60%
SA Water	ESCOSA	2016	60%

Source: Synergies database

2.3 Conclusion on capital structure

Having regard to the evidence from comparable listed entities as well as from regulatory precedent, we consider there are not strong grounds to change the gearing ratio of 50% for GAWB. This is approximately the midpoint of the most frequently applied gearing level in regulatory decisions (60%) and the average and median of the listed comparator set (39%).

However, given that GAWB is exposed to a concentrated and predominantly industrial customer base, a lower gearing ratio could be supported due to the additional equity risk for GAWB arising from this situation. To this end, GAWB may need to reconsider the appropriateness of this gearing assumption at future price reviews.

3 Return on equity

The Sharpe-Lintner Capital Asset Pricing Model (SL CAPM) is expressed as follows:

$$Re = R_f + \beta_e * [E(R_m) - R_f]$$

Where:

R_f = the risk-free rate of return

$E(R_m)$ = the expected return on the market

$[E(R_m) – R_f]$ = the market risk premium

β_e = equity beta (measures systematic risk)

Each of these components are considered in turn.

3.1 Risk-free rate

The risk-free rate is used in estimating the return on equity and debt. There are three main decisions to be made:

- the risk-free proxy used
- the term to maturity
- the averaging period.

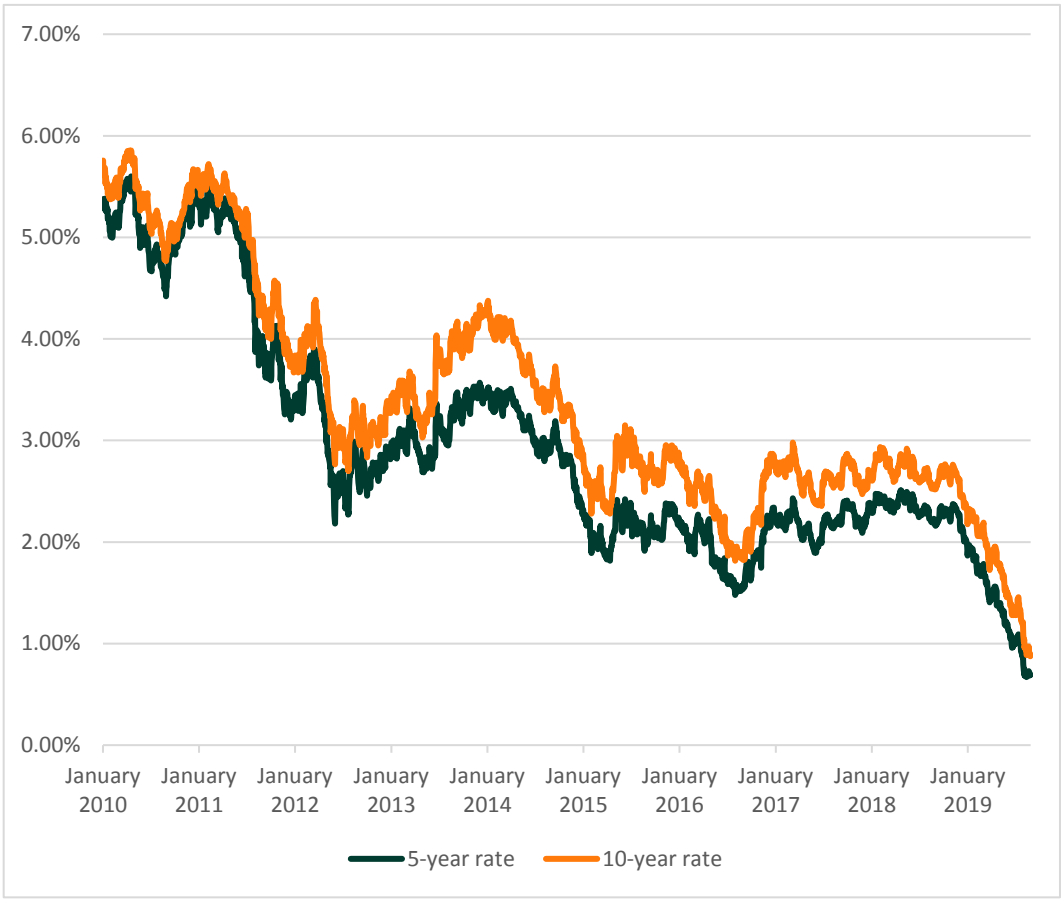
3.1.1 Proxy

The Commonwealth Government bond yield is most commonly used as a proxy for the risk-free rate in Australia, including by the QCA. We consider the Commonwealth Government bond yield remains the best proxy for the risk-free rate in an Australian context.

Recent trends in the risk-free rate

Figure 1 shows that risk-free rates of all maturities have declined significantly in recent months up to August 2019. This has likely been driven by decreases in the RBA cash rate, as well as changing market expectations about interest rates based on economic conditions globally.

Figure 1 Trend in Commonwealth Government bond yields, 2010-present



Data source: RBA data

3.1.2 Term to maturity

In Australia, the term to maturity most commonly applied for investors in infrastructure with long economic lives is ten years. This is consistent with the long-term forward-looking horizon over which it is assumed investors are forming their return expectations under the SL CAPM. Furthermore, in Australia, the ten-year bond is the longest dated government debt instrument with high liquidity and readily available data, which is why it is one of the most commonly used proxies for the risk-free rate in regulatory decisions.

For its Aurizon Network UT5 final decision, the QCA exercised discretion in reaching the final WACC estimate. One of the alternative approaches to its bottom-up WACC methodology that it considered was the use of a 10-year bond term for the risk-free rate, rather than a regulatory term-matched bond, which has historically been the QCA's practice.

In the 2019 Queensland Rail draft decision, the QCA made this reliance on a 10-year risk-free rate more explicit, perceiving merit in considering a 10-year bond term for direct use in a bottom-up WACC assessment. Although this decision remains at the draft stage, the use of a 10-year bond term would bring the QCA into alignment with other Australian economic regulators, who predominantly use a 10-year risk-free rate in their assessments for a range of infrastructure categories.

The QCA considered that adopting this position would contribute towards a return on investment that is at least commensurate with the commercial and regulatory risks facing Queensland Rail. The QCA also noted that other Australian economic regulators have generally accepted the argument that the term of the bond should be a proxy for the life of the regulated asset. We concur with this reasoning, and accordingly we have assumed a 10-year term for the risk-free rate.

3.1.3 Averaging period

In general, corporate finance, academic and regulatory practice is to use short averaging periods close to the date of the commencement of the relevant period (in this case, the regulatory period). This is intended to mitigate problems that may occur if there is a spike in yields on the day that the rate is applied. Accordingly, we have assumed a 20-day averaging period for the risk-free rate. Over a short time horizon though, the choice of averaging period is likely to be of little consequence.

3.1.4 Risk-free rate estimate

Based on a 20-day average of the 10-year Commonwealth Government bond yield to 30 August 2019, our preliminary estimate of the risk-free rate for GAWB is 0.94%.[1] This estimate will need to be updated close to the commencement of GAWB's 2020-25 regulatory period.

3.2 Market risk premium

The MRP is the amount an investor expects to earn from a diversified portfolio of investments (reflecting the market as a whole) that is above the return earned on a risk-free investment. The key difficulty in estimating the MRP arises from it being an expectation and therefore not being directly observable. Whilst the MRP is an inherently forward-looking parameter, the difficulty with observing or inferring it from market

[1] Because the quoted rates are semi-annual, they need to be converted to annual effective rates using the following formula: Annual effective rate = (1+ semi-annual rate/2)^2 -1.

data means that there is valuable information about its value in historical data (historical averages of excess returns from the market above the relevant risk-free rate).

A range of methods have been developed to estimate the MRP falling broadly into two approaches – historical (Ibbotson, Siegel and Wright) and forward-looking (such as Dividend Growth Models (DGMs)). Several Australian regulators also have regard to MRP surveys of financial and equity market practitioners, which can be informative provided they are timely, robust and representative of market sentiment.

In estimating the MRP, the QCA's current weightings for the methods it uses is as follows:

- Ibbotson – 25%
- Cornel DGM – 25%
- Practitioner surveys – 20%
- Siegel – 15%
- Wright – 15%.

3.2.1 QCA precedent on the MRP

The QCA has historically adopted an MRP of 6.5% in conjunction with a risk-free rate that has a term to maturity equal to the length of the regulatory period. This was the methodology used in GAWB's 2015 WACC decision. However, in its UT5 draft decision for Aurizon Network in December 2017, the QCA approved Aurizon Network's proposed MRP of 7.0%. The QCA stated that in light of stakeholder submissions, it had reviewed its position on the Wright approach and will now give "more regard to estimates from the Wright method."[2]

In reaching this conclusion, the QCA noted that its analysis suggesting greater stability in the MRP than the return on equity over time was "not determinative, given the limitations identified."[3] The QCA maintained this approach in both the Seqwater Bulk Water Price Review 2018-21 in March 2018, and the Aurizon Network UT5 final decision in December 2018.

In its 2019 draft decision for the 2020 Queensland Rail draft access undertaking, the QCA applied a 10-year risk-free rate instead of a risk-free rate matching the regulatory

[2] QCA (2017). Aurizon Network's 2017 draft access undertaking, Draft decision, December, p.493.

[3] QCA (2017), p.493.

period.[4] The use of a 10-year risk-free rate led the QCA to decrease its MRP to 6.5% because its methodology relies in part on approaches that respond to changes in interest rates. In our view though, and as elaborated below, an MRP of 7.0% (or higher) is appropriate even when using a 10-year risk-free rate, especially given that the 10-year rate has fallen substantially in recent times. In fact, the current 10-year risk-free rate is now well below any of the 5-year risk-free rate estimates that the QCA has adopted in previous decisions.

Given the inherent volatility in the risk-free rate over time, it is informative to evaluate the expected value of the total market return outcome (measured as the risk-free rate plus the MRP). Because the equity beta we have proposed for GAWB is less than one, the total market return does not perfectly coincide with GAWB's return on equity. However, an assessment of total market returns allows a comparison of parameter assumptions across both regulatory and commercial spheres by removing firm-specific considerations.

We turn now to a detailed examination of the MRP methodologies that comprise the QCA's MRP estimate and explore whether this approach achieves an adequate total market return under current market conditions.

3.2.2 Ibbotson and Siegel MRPs

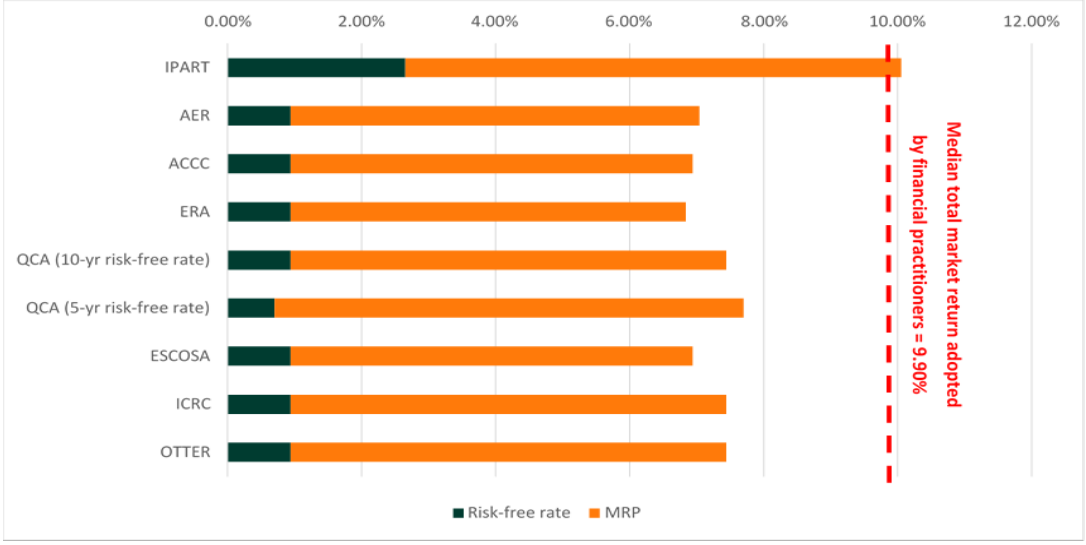
The Ibbotson MRP is calculated as the long-term average of the market return minus the risk-free rate. This results in a relatively stable MRP over time, which may be inappropriate when the risk-free rate is below its long-run average, as has been the case since the Global Financial Crisis. This trend has accelerated in recent months. Nevertheless, this remains the historical method most frequently favoured by Australian economic regulators.

Figure 2 shows a wide range for the total market return currently applied by Australian economic regulators. Where relevant, we have updated the risk-free rate for each regulator based on current market data to ensure that we are making comparisons at the same point in time.[5]

[4] QCA (2019), Queensland Rail's 2020 draft access undertaking, Draft Decision, April, p.32.

[5] IPART calculates its risk-free rate as the midpoint of a short-term and 10-year average risk-free rate estimate.

Figure 2 Market returns applied by Australian regulators



Note: Risk-free rates for all other Australian regulators (except IPART) are based on the current 10-year risk-free rate of 0.94%
Data source: Various regulatory decisions

The total market return ranges between a minimum of 6.84% for the ERA and a maximum of 10.05% for IPART. This compares to a total market return of 7.44%-7.70% for the QCA depending on whether a 5-year or 10-year risk-free rate is used.[6] This estimate remains well below the median total market return applied by financial practitioners according to our analysis of the Connect 4 database presented in this section.

What is evident about most of the Australian regulators estimating total market returns at or below 8% is that they typically combine a short-term average of the risk-free rate with a long-term average of the historical excess return (such as the Ibbotson MRP). If the short-term risk-free rate is reflective of conventional market conditions, then this is less likely to be problematic. Current market conditions are far from this ideal, with Commonwealth Government bond yields close to all-time lows.

This is not to say that the long-term averaging period for the MRP is inappropriate. It is wholly appropriate that a long-term data series should be employed, where available. However, regard must be had to the range of risk-free rates that have underpinned these historical excess returns over time. Between 1883 and 2018, the average government bond yield was 5.5%.[7]

[6] As discussed at the beginning of this section, the choice of risk-free rate for the QCA approach also influences the MRP that is applied.

[7] Indeed, the average bond yield across shorter sampling periods is higher (between 6.2% and 7.7%).

The QCA's most recent Ibbotson MRP estimate (in January 2019) is 6.2%, while the most recent Siegel MRP estimate is 5.6% (also in January 2019). Given that these estimates are typically updated annually, we anticipate that these will remain the QCA's assumed values for the remainder of 2019. The QCA identifies "statistically defensible" weights for the Ibbotson and Siegel MRPs as 25% and 15%, respectively. The QCA argues this set of weights places relatively more emphasis on the two methods that are entirely independent of each other (the Ibbotson and Cornell DGM methods). In so doing, it argues this maximises the use of the information available (and reduces the mean square error of the estimate).

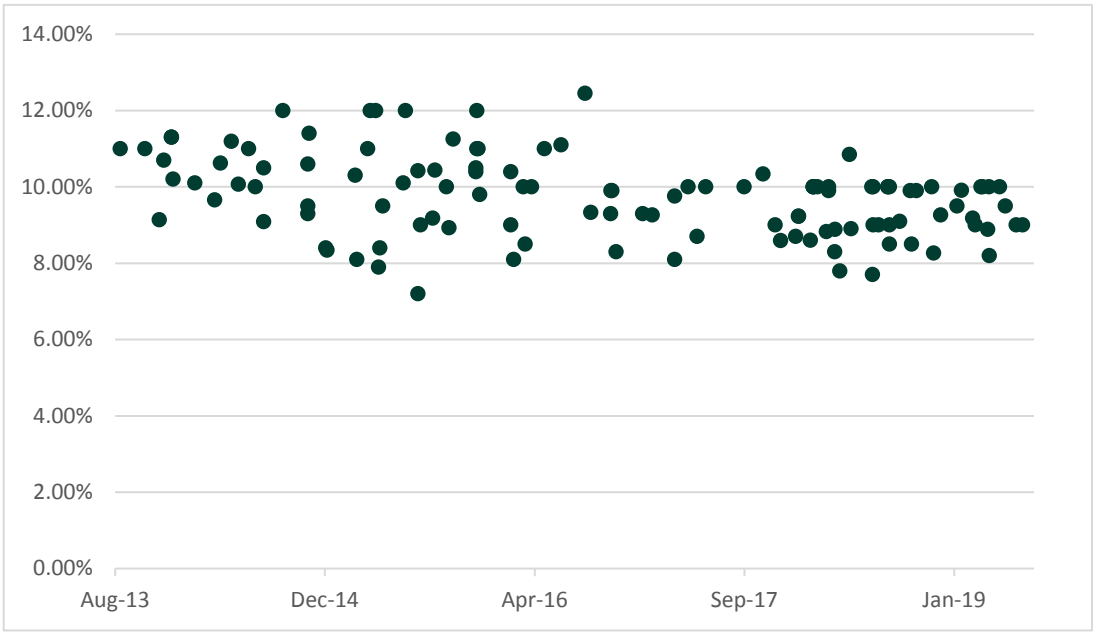
However, given we consider the short-term risk-free rate is not reflective of conventional market conditions, the QCA's existing weightings for the Ibbotson and Sigel MRPs are not appropriate.

3.2.3 Surveys and independent expert reports

The QCA currently applies an MRP of 6.8% based on MRP estimates used in independent expert reports and results from surveys. The QCA applies a weighting of 20% for this method.

Synergies has used data on independent expert reports extracted from the Connect 4 database to generate estimates of the post-tax total market return. The median post-tax total market return for reports published from January 2013 to present is 9.90% (with an average of 9.72%), as shown in Figure 3 below. We observe a modest decline in the total market return since the end of 2017, with estimates used by independent experts clustering between 8% and 10%. This remains consistent with a point estimate for the total market return of around 9%.

Figure 3 Post-tax total market returns implied by independent expert reports



Data source: Connect 4, Synergies calculations

Overall, the market evidence that we have presented is consistent with the QCA's MRP assumption of 6.8% from market surveys and independent expert reports. However, the QCA appears to incorporate this value into its overall MRP estimate without taking account of the tendency for market practitioners to combine such MRP estimates with risk-free rates based on longer-term averages.

The average market return of 9.72% observed in this sample consists of an MRP of 6.27% and risk-free rate of 3.45%. The corresponding contemporaneous risk-free rate (as commonly applied in regulatory processes) over the sample period was on average 2.75% (70 basis points lower). Consequently, retaining an on-the-day approach to the risk-free rate under current market conditions, which gives a risk-free rate of 0.94%, implies that 6.8% provides only a lower bound for the effective MRP that financial practitioners would apply.

Recent market commentary highlights that it is imperative to consider the relationship between the MRP, the risk-free rate and the return on equity. In an October 2018 independent expert report, KPMG highlighted that "market evidence indicates that bond yields and the market risk premium are strongly inversely correlated." They go on to stress that:[8]

> It is important that any assessment of the risk-free rate should be made with respect to the position adopted in deriving the market risk premium. As the market risk

[8] KPMG (2018a). Scottish Pacific Group Limited – Independent Expert report, 24 October, p.97.

> premium is based on a long-term view of the market, it is also important to do the same with the risk-free rate to ensure the combination of the risk free rate and market risk premium represents an appropriate return in the current investment environment.

This suggests to us that a comparison of total market returns (i.e. risk-free rate plus MRP) is relevant. In an earlier January 2018 report, KPMG also stated that, "On balance, we consider adopting the spot Government Bond yield in isolation of a change in the MRP to be inappropriate and therefore have applied an adjusted risk-free rate."[9] With the 10-year Commonwealth Government bond rate still at near record low levels, this comment remains highly applicable to GAWB's WACC estimate, especially if Australian Commonwealth Government bond yields decline further, which is a distinct possibility.

Countering arguments that current interest rate conditions constitute a "new normal", Grant Samuel argued in a separate report that they do not believe the current position is sustainable over the long term, and that "the risk is clearly towards a rise in bond yields."[10] Grant Samuel then went on to observe that some academics and 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. It contends that this approach "has become increasingly common among broker analysts."[11]

The risk-free rate has decreased even further since this independent expert report was written, so the low interest rate phenomenon is an increasingly relevant consideration. Although KPMG and Grant Samuel propose an adjustment to the return on equity via the risk-free rate rather than the MRP, both experts make clear that it is inappropriate to combine a long-term estimate of the MRP (as given by the Ibbotson or Siegel methodologies) with a contemporaneous estimate of the risk-free rate (as given by the on-the-day approach).

A key theme emerging from this market commentary is that a bottom-up compilation of WACC parameters is not enough in isolation of the wider consideration of an overall return on equity outcome capable of incentivising investment. When return on equity parameters, such as the risk-free rate, depart significantly from their long-term averages, it is imperative that this is at least partially accommodated in the total market return.

Based on this recent evidence, we consider it is imperative to ensure that the sum of the risk-free rate and MRP provides an adequate overall return on equity. It is also important

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[9] KPMG (2018b). Altona Mining Limited – Independent Expert's report, 9 January 2018, p.95.

[10] Grant Samuel (2018). Billabong International Limited – Proposal from Boardriders, Inc., 13 February, p.51.

[11] Grant Samuel (2018), p.52.

to note that the risk-free rate is now even lower than it was at the time of these commentaries, which suggests that the dampening effect on the allowable return on equity from using a long-term estimate of the MRP with a contemporaneous estimate of the risk-free rate will be even more pronounced at the present time.

3.2.4 Wright MRP

The Wright MRP is calculated as the long-term average of the return on the market. This results in a relatively stable return on equity over time, which is more consistent with evidence from financial markets. Evidence from market practitioners above indicates that the required return on capital does not necessarily change one-for-one with observed government bond yields, especially when yields are low.

In an article for the RBA Bulletin, Lane and Rosewall (2015) investigate market practice on the relationship between interest rates and investment decisions in Australia. The authors, from the Economic Analysis Department of the RBA, employ evidence from the RBA's business liaison program, which conducts discussions with market contacts who are CEOs, CFOs or operations managers from primarily mid-sized and large-sized firms on an annual or semi-annual basis. These businesses are selected on the basis that their views are more likely to be reflective of economy-wide trends rather than firm-specific factors.

The RBA's primary finding is that "the capital expenditure decisions of many Australian firms are not directly sensitive to changes in interest rates."[12] Instead, "Australian firms tend to require expected returns on capital expenditure to exceed high 'hurdle rates' of return that are often well above the cost of capital and do not change very often." The authors also remark that this phenomenon is not confined to Australia, with other advanced economies exhibiting similar patterns of hurdle rates sometimes several percentage points above the contemporaneous WACC.

More broadly, post-GFC evidence supports the notion that the required return on equity is relatively stable over time. This point was implicitly made by Glenn Stevens, former Governor of the RBA, in a speech to the Australian American Association:[13]

> But another feature that catches one's eye is that, post-crisis, the earnings yield on listed companies seems to have remained where it has historically been for a long time, even as the return on safe assets has collapsed to be close to zero (Graph 2). This seems to imply that the equity risk premium observed *ex post* has risen even as the risk-free rate has fallen and by about an offsetting amount. Perhaps this is partly

[12] Lane, K. & Rosewall, T. (2015). Firms' investment decisions and interest rates, RBA Bulletin, June quarter 2015, p.1.

[13] Glenn Stevens, Address to The American Australian Association Luncheon, New York, USA – 21 April 2015.

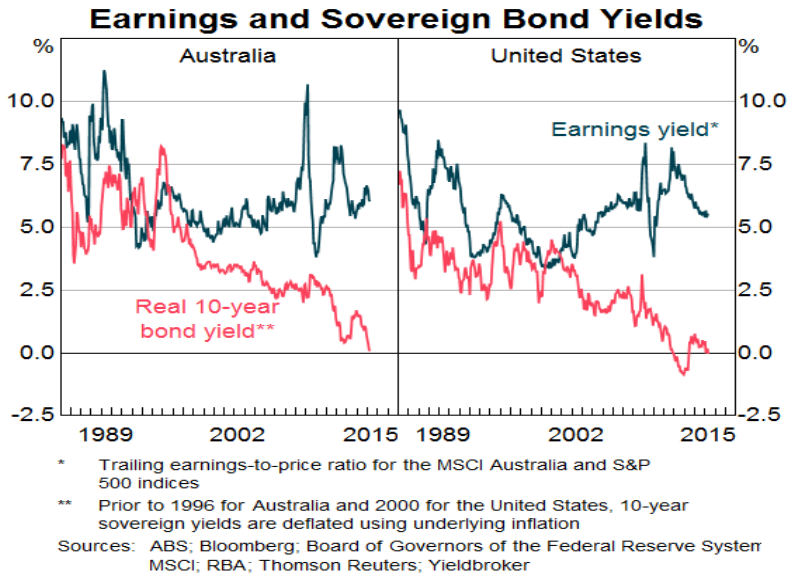
explained by more sense of risk attached to future earnings, and/or a lower expected *growth rate* of future earnings.

Or it might be explained simply by stickiness in the sorts of 'hurdle rates' that decision makers expect investments to clear. I cannot speak about US corporates, but this would seem to be consistent with the observation that we tend to hear from Australian liaison contacts that the hurdle rates of return that boards of directors apply to investment propositions have not shifted, despite the exceptionally low returns available on low-risk assets.

The possibility that, *de facto*, the risk premium being required by those who make decisions about real capital investment has risen by the same amount that the riskless rates affected by central banks have fallen may help to explain why we observe a pick-up in financial risk-taking, but considerably less effect, so far, on 'real economy' risk-taking.

The graph the Reserve Bank Governor referred to is reproduced in Figure 4.

Figure 4 Earnings and sovereign bond yields



Source: RBA

The QCA's most recent Wright MRP estimate was 8.9% (January 2019) based on a risk-free rate of 2.28%. Because the Wright MRP varies inversely with the risk-free rate, it needs to be updated to reflect the recent decreases in the risk-free rate. The January 2019

decision implies a total market return of approximately 11.18%.[14] Updating the QCA's Wright MRP estimate to 30 August 2019 would result in an MRP of 10.24%.[15]

The QCA has previously indicated that it assigns only a 15% weighting to this approach. In light of recent market conditions, we consider a strong case can be made for this weighting to be increased. The Ibbotson and Siegel MRPs are less relevant indicators when the risk-free rate deviates from its historical long-run average. We recommend that the weighting assigned to the Wright MRP should be at least 25%.

3.2.5 Cornell Dividend Growth Model

DGMs are forward looking approaches which estimate the market risk premium by reference to dividend yields, long-term expected dividend growth and a transitional path between these values. Three Australian economic regulators (IPART, the QCA and the ERA) rely to varying extents on DGMs to inform their MRP estimate, and we consider that there is merit in augmenting the MRP estimate with a forward-looking component.

The QCA's most recently published Cornell DGM estimate, in January 2019, was 5.1%. This estimate is clearly an outlier among other DGM estimates recently calculated by three other Australian regulators, AER, IPART and the ERA. These are shown in Table 3 and are also displayed visually in Figure 5 below.

Table 3 Recent regulatory DGM estimates

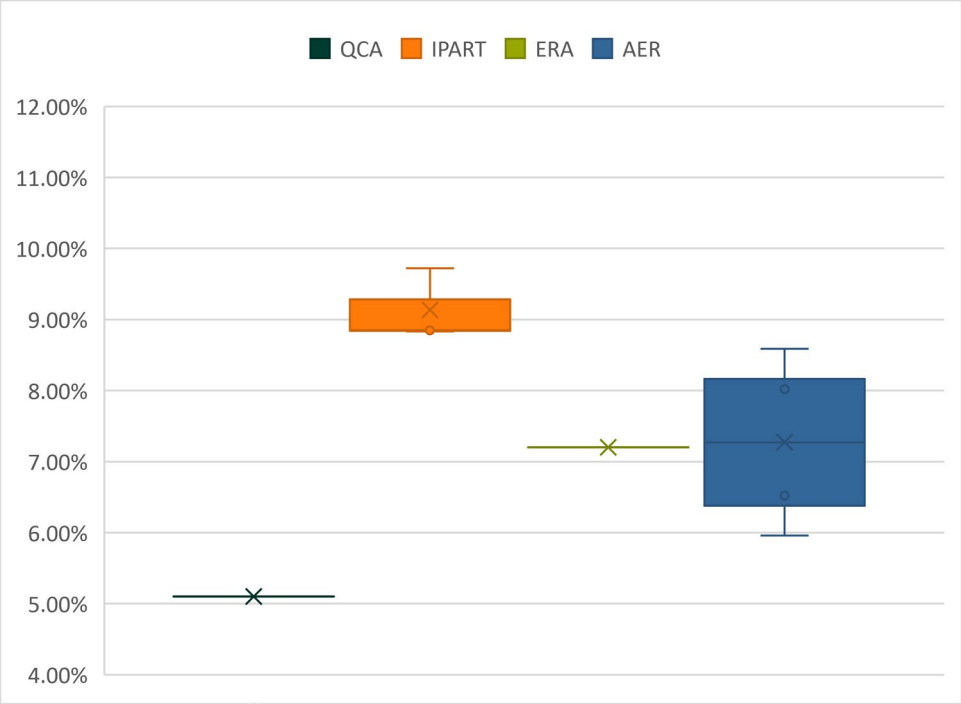
Regulator	Date	Methodology	Estimate
QCA	January 2019	Cornell DGM	5.1%
IPART	January 2019	Damodaran	8.83%
		Bank of England (2002)	9.72%
		Bank of England (2010)	8.85%
ERA	October 2018	Two-stage DGM	7.2%
AER	December 2018	Various	6.52%-8.02% (5.96%-8.59% applying sensitivity analysis)

Note: All regulators listed here assume a 10-year risk-free rate in their analysis
Source: Various regulatory decisions

[14] Total market return = risk-free rate + MRP = 2.28% + 8.9% = 11.18%

[15] Revised MRP = total market return – updated risk-free rate = 11.18% - 0.94% = 10.24%

Figure 5 Range of regulatory DGM estimates



Note: The crosses for each regulatory denote the mean DGM MRP estimate
Data source: Synergies analysis of various regulatory decisions

We acknowledge that these estimates may differ due to differences in timing, but it is clear any such differences alone are not capable of explaining this gap. Most likely this relates to adjustments that the QCA makes to long-run growth assumptions, to which MRP models are extremely sensitive. The 25% weighting the QCA assigns to the Cornell DGM means that these parameter assumptions have a significant bearing on its MRP estimate.

In light of evidence from other Australian regulators' use of the DGM methodology presented here, we recommend this weighting should be no higher than 15%.

3.2.6 Conclusion on the MRP

Even if the QCA is to now adopt a 10-year risk-free rate in its determinations, there remains reasonable grounds for an MRP of at least 7.0% to be applied, especially given the recent substantial declines in the risk-free rate to new historically low levels. Our recommendation is that more weight should be given to the Wright MRP methodology, especially when risk-free interest rates are well below their long-term averages, as is now the case.

Increasing the weight assigned to the Wright MRP would involve offsetting decreases to other methodologies that comprise the QCA's approach, such as the relatively high

weighting the QCA assigns to the Ibbotson and Siegel MRPs. The QCA could also consider revising the growth assumptions underpinning its persistently low Cornell DGM estimates, which are clearly not delivering outcomes consistent with market dynamics or other indicative regulatory estimates, or else consider decreasing the 25% weighting.

For the purpose of GAWB's 2020 WACC estimate, we have applied an MRP of 7.0% based on the following minimal amendments to the QCA's MRP weighting scheme:

- Ibbotson MRP: 25% (no change, but weighting could plausibly be reduced given current market conditions).
- Siegel MRP: 15% (no change, but weighting could plausibly be reduced given current market conditions and methodological limitations).
- Surveys and independent expert reports: 20% (no change).
- Wright MRP: 25% (increased from 15% in light of current market conditions).
- Cornell DGM: 15% (decreased from 25% due to concerns about the robustness of the estimate).

This approach retains the QCA's currently-assumed weightings for the Ibbotson MRP, Siegel MRP and surveys/independent expert report estimates. Meanwhile, it reduces the weighting assigned to the Cornell DGM, fully offset by an increase in the Wright MRP weighting to 25%.

This reallocation of weights achieves two objectives. Firstly, by giving more weight to the Wright MRP, the overall MRP estimate is more responsive to changes in the risk-free rate, which is consistent with market evidence we have presented regarding investor expectations regarding the return on equity. Secondly, reducing the weight on the Cornell DGM ameliorates any issues arising from the assumptions or adjustments underpinning the QCA's application of the model; recent estimates emanating from the QCA's Cornell DGM are clearly outliers among Australian economic regulators using DGMs. We recommend that GAWB should monitor DGM estimates from other Australian economic regulators and other sources, and it may need to revisit the weighting on the Cornell DGM accordingly.

Applying these revised weightings results in a weighted average MRP of 7.08%. We firmly believe that these weighting adjustments are more likely to lead to an adequate return on equity for GAWB under existing atypical equity and debt market conditions. (A simple average of these approaches is 6.79%, which also results in an MRP of 7.0% following the QCA's standard approach of rounding the MRP to the nearest half percent.) That being said, we consider an MRP of 7.0% remains a very conservative

assessment, especially given recent movements in the risk-free rate. We have conservatively retained the QCA's preferred weightings on the Ibbotson and Siegel MRPs but decreases in these weightings would be defensible on the basis of current market data, with a higher weighting than 25% given to the Wright MRP.

3.3 Beta

There are three key sources of information that can inform the assessment of an entity's systematic risk, namely:

- Benchmark results from comparable entities
- First principles analysis
- Regulatory precedent.

In undertaking an empirical analysis of beta estimates, reference needs to be made to an appropriate set of listed comparators for whom equity betas can be estimated.

3.3.1 Listed comparable companies and regulatory precedent

The QCA, following advice from its advisor, Incenta, applied an asset beta for GAWB of 0.40 in 2015. More recently, Incenta determined an asset beta of 0.41 for Seqwater. While only fractionally lower, it is questionable why GAWB's beta should be below Seqwater's asset beta given the different systematic risks of each entity. In practice, this occurs because Incenta uses a virtually identical sample of comparator firms for both water businesses.[16]

Although listed water utilities would seem a natural starting point for sourcing comparators, the first principles analysis below shows that the beta estimate arising from such a sample is likely to establish, at best, a lower bound for GAWB's own systematic risk exposure. Given that GAWB's largest customers are involved in activities linked to the mining and resources processing sectors, we have investigated beta estimates for relevant companies that operate in the mining or industrial services sector.

In effect, the composition of GAWB's customer base imparts on it aspects of a mining or industrial services company's risk profile. Although we are not proposing to place full weight on these kinds of firms, this evidence allows us to establish a suitable range for GAWB's asset beta, from which a point estimate can be identified as informed by the first principles analysis.

[16] Incenta did use a comparator set of toll roads to form an upper bound for Seqwater's asset beta, but this did not affect the final estimate of 0.41.

3.3.2 Beta estimation

Betas have been estimated based on five years of monthly returns, regressed against the relevant domestic share market index using Ordinary Least Squares. We also eliminated any firms with:

- a t-statistic of less than 2 (we consider this is particularly important in measuring the statistical significance of the beta estimate)
- an R^2 less than 0.1.

For the QCA's 2015 GAWB review, Incenta also applied a market capitalisation threshold of USD200 million, which we have adopted here. Previously, Incenta has restricted their comparator sample to firms from either English-speaking countries or Western Europe. We consider that this is potentially too strong a restriction, possibly limiting the size and robustness of the sample by more than is necessary or prudent.

Instead, we have filtered the sample on the basis of FTSE (Financial Times Stock Exchange) country classifications. These country criteria are used in a wide array of global index funds and also frequently appear in media reports and academic literature. This is likely to be a more robust and informative classification than language or geography, as FTSE considers various market quality indicators such as market liquidity, stock market oversight, whether equity and foreign exchange markets are free and "well-developed", level of transaction costs, and brokerage quality. We have restricted our comparator set to countries with a Developed or Advanced Emerging rating.[17]

Incenta has previously expressed reservations about reliance on R^2 as a filtering criterion. In essence, a low R^2 suggests that the movements of the market index explain only a small proportion of the variation of the stock under investigation. This contravenes the theory underpinning the CAPM, which stipulates that the return on a stock depends on its correlation with the market. It would be unreasonable to expect an extremely high R^2 as there are many idiosyncratic events that affect an individual stock. However, if less than 10% of the variation in the stock can be explained by the market, this calls into question the reliability of the estimate. In any case, we place primary emphasis on statistical significance as measured by t-statistics and filtering according to R^2 does not change the results materially.

The resulting equity betas were de-levered to produce an asset beta using the Conine formula. Whilst we do not endorse the use of a non-zero debt beta, we have applied the QCA's current assumption of 0.12 in our estimate of GAWB's WACC.

[17] FTSE Russell (2019). FTSE Equity Country Classification March 2019 interim update, 29 March.

The average gearing levels for each business were calculated using annual data over the five-year period (using the ratio of net debt to market value of equity).

Results

The listed water utilities that emerged from the filtering process described above are presented in Table 4. The median and average asset beta are 0.52 and 0.49, respectively, when rounded to two decimal places.

Table 4 Comparable companies asset beta summary

Company	Country	5 year asset betas	Company description
United Utilities Group PLC	UK	0.410	United Utilities Group PLC manages and operates the regulated electricity distribution, water, and wastewater networks in North West England. The Company also manages other infrastructure assets in the United Kingdom and overseas.
Severn Trent PLC	UK	0.421	Severn Trent Plc supplies water, waste, and utility services throughout the United Kingdom, Europe, and the United States. The Company offers a range of water purification, sewage treatment and disposal, and recycling services. Severn Trent also provides utility companies with a range of information technology and software solutions, as well as engineering consultancy services.
Pennon Group PLC	UK	0.390	Pennon Group Plc operates and invests primarily in the areas of water and sewerage services and waste management. Their principal subsidiary, SouthWest Water Limited, holds the water and sewerage appointments for Devon, Cornwall and parts of Somerset and Dorset. Viridor Waste Limited operates a waste treatment and disposal businesses in the United Kingdom.
Aqua America Inc	US	0.317	Aqua America, Inc. is a water utility company. The Company supplies water to residential, commercial, industrial, and public customers. Aqua America serves residents through its water and wastewater operations in the Northeastern Southeastern, and Midwestern United States.
Cia de Saneamento Basico do Estado de Sao Paulo (SABESP)	Brazil	0.680	Cia de Saneamento Basico do Estado de Sao Paulo (SABESP) collects, treats, and distributes water. The Company also engineers and constructs water distribution infrastructure and water treatment systems.
Aguas Andinas	Chile	0.536	Aguas Andinas S.A. distributes potable water and offers sewage treatment services in the Metropolitan Region of Chile. The company operates four processing plants.
Companhia de Saneamento do Parana	Brazil	0.667	Companhia de Saneamento do Parana supplies water to the state of Parana in Brazil, including the city of Curitiba, and several other towns.
TTW PCL	Thailand	0.336	TTW PCL is a water utility company that supplies water in the provinces of Nakorn Pathom and Samut Songkram.
China Water Affairs Group Limited	Hong Kong	0.547	China Water Affairs Group Limited, through its subsidiaries, supplies city water and sewage treatment. The Company supplies raw water and tap water, treats sewage, constructs water supply pipe networks, and installs water meters.
Kangda International Environmental Co., Ltd.	Hong Kong	0.521	Kangda International Environmental Co., Ltd. invests and operates wastewater treatment facilities in China.

Company	Country	5 year asset betas	Company description
AS Tallinna Vesi	Estonia	0.543	AS Tallinna Vesi provides water supply and wastewater services in the City of Tallinn, Estonia, and in its surrounding areas.
Average		**0.488**	
Median		**0.521**	
Minimum		**0.317**	
Maximum		**0.680**	

Note: Equity betas were de-levered using the Conine formula. Estonia is rated as Frontier by FTSE, but we have retained AS Tallinna Vesi in the sample on the basis of Estonia's European Union and Eurozone membership. Moreover, Incenta has previously included European countries in its comparator sets. The average and median asset betas remain above 0.45 if this firm is excluded.

Source: Bloomberg, Synergies calculations

In its preferred comparator set for GAWB in the QCA's 2015 WACC review, Incenta calculated asset betas for 12 firms. Of these 12 firms, only 4 remain statistically significant in the updated analysis. These firms are United Utilities Group PLC, Severn Trent PLC, Pennon Group PLC and Aqua America Inc. We consider this is too small a comparator set to facilitate robust analysis.

The results in Table 4 alone provide support for an increase in the asset beta to 0.45 from its currently assumed value of 0.40. Nevertheless, as examined in the first principles analysis that follows, these comparators are typically more residential in character with greater diversification in the commercial and industrial base.

One way of addressing this issue given GAWB's predominantly industrial customer base is to incorporate mining and industrial services companies. Applying the same statistical filtering criteria as for the water utility sample, we have sourced relevant comparators from the Bloomberg Industry Classification Systems (BICS) Mining Services and BICS Industrial Services categories to augment the beta sample. This results in the inclusion of four additional companies. The revised results are displayed in Table 5. The average asset beta for this sample is 0.55, while the median is 0.54.

Table 5 Comparable companies asset beta summary

Company	Country	5 year asset betas	Company description
United Utilities Group PLC	UK	0.410	As per Table 4
Severn Trent PLC	UK	0.421	As per Table 4
Pennon Group PLC	UK	0.390	As per Table 4
Aqua America Inc	US	0.317	As per Table 4
Cia de Saneamento Basico do Estado de Sao Paulo (SABESP)	Brazil	0.680	As per Table 4
Aguas Andinas	Chile	0.536	As per Table 4
Companhia de Saneamento do Parana	Brazil	0.667	As per Table 4

Company	Country	5 year asset betas	Company description
TTW PCL	Thailand	0.336	As per Table 4
China Water Affairs Group Limited	Hong Kong	0.547	As per Table 4
Kangda International Environmental Co., Ltd.	Hong Kong	0.521	As per Table 4
AS Tallinna Vesi	Estonia	0.543	As per Table 4
Downer EDI	Australia	0.958	Downer EDI Limited provides engineering and infrastructure management services to the public and private rail, road, power, telecommunications, mining and resources sectors in Australia, New Zealand, Asia and the Pacific. Downer provides rolling stock services, drilling services for the exploration industry, mine planning and management services and highway maintenance.
Veolia Environnement SA	France	0.378	Veolia Environnement SA operates utility and public transportation businesses. The Company supplies drinking water, provides waste management services, manages and maintains heating and air conditioning systems, and operates rail and road passenger transportation systems.
Sigdo Koppers	Chile	0.770	Sigdo Koppers S.A. provides services in several industries, including engineering and construction, agriculture, administrative services, education, transportation and mining.
SGS SA	Switzerland	0.787	SGS SA provides industrial inspection, analysis, testing, and verification services. The Company inspects, samples, analyses, and monitors raw materials, petroleum, food, crops, chemicals, consumer goods, and production machinery for compliance with industrial standards and local regulatory requirements, including tax and duty. SGS serves businesses worldwide.
Average		**0.551**	
Median		**0.536**	
Minimum		**0.317**	
Maximum		**0.958**	

Note: Equity betas were de-levered using the Conine formula.
Source: Bloomberg, Synergies calculations

The take-or-pay elements of GAWB's commercial arrangements are different from what we typically observe in other regulated sectors, such as rail and ports. Therefore, they do not provide the same degree of revenue smoothing or protection to the infrastructure provider.

Consequently, while GAWB may benefit from some commercial protections not extended to other industrial services companies, these arrangements typically apply only for the duration of the regulatory period. Beyond that point, GAWB is susceptible to customers adjusting their reservations, including through managerial decisions which are likely to bear close correlation with broader economic conditions. Therefore, the results from the expanded sample continue to reinforce an asset beta of at least 0.45 for GAWB in light of its industrial and resources-related exposures.

3.3.3 First principles analysis

The key objective of the first principles analysis is to assess the extent to which the firm's net cashflows (revenues less costs) have some sensitivity to movements in the general economy. Lally identifies a number of factors to be considered here, including:

- nature of the product or service
- nature of the customer
- pricing structure
- duration of contracts
- market power
- nature of regulation (if any)
- growth options
- operating leverage.[18]

The first principles analysis is largely contextual and can inform an assessment of where beta might sit within a range (that is, whether a factor puts upward or downward pressure on the estimated beta for the firm). However, this remains qualitative. Noting the inherent uncertainty in beta estimation, it is not feasible to reliably quantify the impact of a particular factor on beta in isolation of other factors.[19]

A number of these factors are also interrelated – that is, the impact of one factor on beta could either be increased or lessened by another factor. Hence, while the impact of each factor can be considered in isolation, the overall assessment will reflect the net impact of the factors in combination.

In undertaking this assessment, we have had close regard to the systematic risk profile of Seqwater given it is another water utility regulated by the QCA, and we highlight where its systematic risk exposure is likely to diverge from that of GAWB. As such, the first principles analysis provides insights into whether the QCA's assumed equivalence of systematic risk profiles is appropriate.

Nature of the product / nature of the customer

These first two factors are inextricably linked and so will be considered together.

[18] Lally, M. (2004). The cost of capital for regulated entities, Report prepared for the Queensland Competition Authority.

[19] This would necessitate being able to have two samples, where the firms in the samples are largely identical other than for the relevant factor.

GAWB has a primarily industrial customer base, with 80% of volume accounted for by these users. This is a significant source of differentiation from Seqwater, as well as the listed water utility comparators that were available for beta analysis in the previous section. In the case of Seqwater, approximately 70% of water supplied by Seqwater is used for residential purposes (as of 2018).

Among GAWB's largest customers are:

- Two alumina refineries, Queensland Alumina Limited (QAL) and Rio Tinto Aluminium Yarwun (RTAY);
- Two electricity generators, Callide Power Management and CS Energy – Gladstone; and
- Gladstone Regional Council (serving residential customers).

With regard to the impacts of a concentrated customer base, in the context of the West Moreton system for Queensland Rail, the QCA observed that:[20]

> We view that, all other things being equal, having a smaller number of customers could increase the overall risk profile of a firm. A smaller customer base causes counterparty risk to be diversified across a smaller pool of customers, potentially amplifying the impact on revenue caused by a material decline in customer volumes. However, we acknowledge that this is only one factor that determines a firm's exposure to systematic risk – other market characteristics, such as the resilience of the customer base, may offset the effect of a small customer base.

At one extreme, such a concentrated customer base heightens the prospect of stranding risk, which is asymmetric and therefore not compensated through the CAPM. However, even moderate economic fluctuations can lead to changes in levels of customer business activity. As a result, it is important to understand the drivers underpinning the industries to which these customers belong.

Key external drivers for alumina refinement include the exchange rate, electricity service prices and demand from aluminium smelters.[21] Large amounts of water are required by alumina refineries in order to process solutions, generate steam, and recover chemicals by washing. Figure 6 shows that Alumina prices have spiked dramatically since 2017 albeit with some more recent softening. In part, this has been driven by China reducing production of alumina due to environmental concerns.

[20] QCA (2019), p.142.

[21] IBISworld (2018). Alumina production in Australia, Industry report C2131.

Figure 6 Alumina prices, 2000-2019

Data source: Resources and Energy Quarterly June 2019 – Department of Industry, Innovation and Science

Although current alumina market conditions appear to be favourable for Australian producers, recent evidence shows that Gladstone-based producers are sensitive to adverse events. In 2016, QAL conducted several rounds of redundancies in response to deteriorating market conditions, characterised by low alumina prices but high electricity prices.[22]

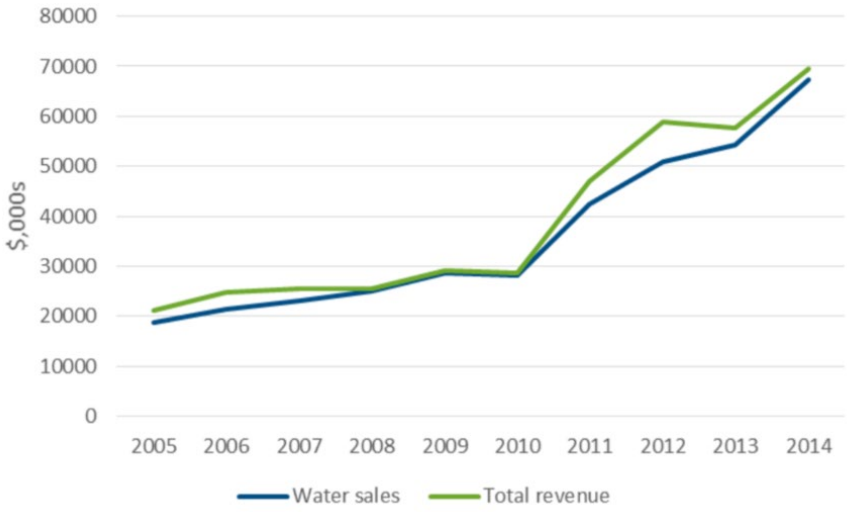
The two electricity generators that GAWB supplies, Callide Power Management and CS Energy – Gladstone, tend to be less sensitive to commodity market conditions, but nevertheless participate in a competitive national energy market. In its July 2019 Final Report for the NSW Rail Access Undertaking, IPART determined an asset beta of 0.58 for an electricity generation proxy industry (corresponding to an equity beta of 0.9 with 47% gearing).[23] IPART noted that this was well above the beta that it had previously applied for other sectors, including water utilities. This strongly suggests that a water utility with significant exposure to this sector would face higher systematic risk, holding all else constant.

In its previous 2015 GAWB WACC report for the QCA, Incenta presented a chart, reproduced in Figure 7, of GAWB's water sales and total revenue from 2005-2014. It pointed to the fact that GAWB's revenues continued to rise during the GFC as evidence that GAWB was unlikely to be exposed to more systematic risk than other water utilities.

[22] Gladstone Observer (2016). "'Challenging market': QAL workers made redundant", 6 October.

[23] IPART (2019). Rate of return and remaining mine life, Final report, July. IPART used beta estimates from three proxy industries (coal mining, electricity generation and rail transport) to inform a single beta estimate for rail networks covered by the undertaking. These proxy industries reflected the different end uses of the rail infrastructure.

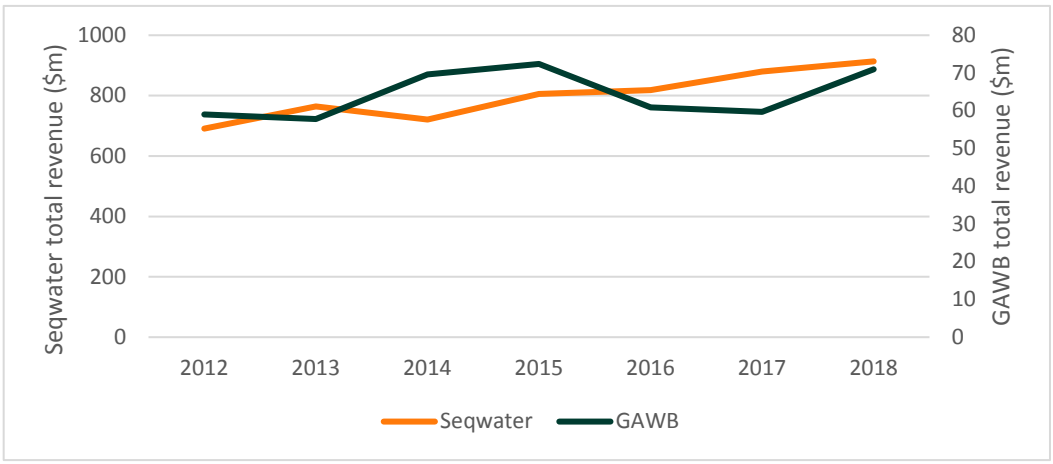
Figure 7 GAWB water sales and total revenue, 2005-2014



Data source: Incenta, based on GAWB annual reports

An updated version of this chart comparing GAWB and Seqwater is presented in Figure 8. Since 2012, GAWB's total revenue has clearly been more variable than Seqwater's.[24] Further, Seqwater's total revenue has increased steadily over this timeframe, except for a slight decrease in revenue in 2014, reflecting the impact of its QCA-approved price path. GAWB's relatively small size relative to Seqwater is also likely to result in more cash flow volatility.

Figure 8 Total revenue for GAWB and Seqwater, 2012-2018



Data source: GAWB and Seqwater annual reports

[24] We have restricted the analysis to 2012 onwards; Seqwater's revenue almost doubled between 2011 and 2012, most likely driven by industry restructuring, which included mergers with LinkWater, the South East Queensland Water Grid Manager, and the Queensland Water Commission.

The factors discussed up until this point pertain mostly to demand factors. In terms of water supply, Lake Awoonga is the only available source for GAWB to deliver water to customers. However, weather risk is generally treated as non-systematic in nature as it tends to be uncorrelated with most forms of domestic economic activity.

In a 2010 report to the QCA, Marsden Jacob Associates (MJA) found that customers universally require high reliability supplies and, as a result, have no interest in GAWB providing multiple products defined by customers' required levels of service.[25] This suggests the majority of GAWB's users would not be in a position to absorb reductions in water volume. This could only be accommodated by reducing their output, which could lead to an inability to cover costs.

MJA also found that the level of service quality differentiation between GAWB's customers was narrower than what had been observed in irrigation supply schemes, where differentiated products were more widely accepted. MJA's analysis uncovered only marginal evidence of differences in desired service levels among GAWB's customer base, with some exhibiting a potential willingness to consider trading small volumes of their allocations with other customers.

Pricing structure

GAWB's prices are set at the start of each regulatory period and are increased only by CPI during this period. This framework limits the ability of GAWB to adjust its prices in response to changes in short-run economic conditions. Holding all else constant, this will have the tendency to increase systematic risk exposure, if the inability to adjust prices causes revenue to fluctuate more than would otherwise be the case.

Duration of contracts

We understand that GAWB's customers can enter into short- or long-dated contracts (i.e. from 1 year to greater than 20 years). As noted previously, GAWB's commercial arrangements are different from those typically used for port or rail infrastructure. GAWB's commercial arrangements provide weaker revenue protection compared to the take-or-pay contractual arrangements in these industries.

In addition, there are also risks surrounding contract renewal over the medium to long term. Even during the term of a contract, GAWB's ability to recover revenue relies on the continued viability of industrial customers, whose profitability is generally correlated with domestic economic activity. Clearly this distinguishes GAWB from conventional metropolitan water networks, such as Seqwater, whose more diversified

[25] QCA (2010). Gladstone Area Water Board: Investigation of pricing practices, Final Report, June, p.47.

customer base is dominated by residential demand that is less sensitive to domestic economic activity.

Market power

The existence of market power will have a mitigating effect on systematic risk. This assumes that where a firm possesses market power, it can exercise that power to its advantage. This in turn is a function of considerations, such as the degree of market power held, the number of buyers in the market and the extent to which those buyers can exert countervailing power in negotiations.

As the only supplier of bulk water in the Gladstone region, GAWB possesses market power, including because there are no viable alternative sources of water for GAWB's customers. However, it is also the case that many of GAWB's industrial customers are large and well-informed consumers of water such that they are likely to be able to exert countervailing power in negotiations with GAWB regarding their water supply. Further, the existence of market power does not mitigate GAWB's systematic risk exposure any more than it does for the listed water utilities or Seqwater.

Form of regulation

The QCA, drawing on advice from Incenta, has previously contended that the presence of economic regulation, including revenue caps, reduces systematic risk. Whilst we accept that there are some scenarios where this may be the case, these are less applicable to GAWB and its systematic risk profile. GAWB is subject to price monitoring, in contrast to Seqwater, which is subject to deterministic price regulation.

Under GAWB's current regulatory framework, it receives some protection for revenue fluctuations, such that it can carry forward annual revenue variances compared to QCA-approved forecasts that are more than 10% of total revenue to the next regulatory period (indexed at WACC). In other words, GAWB bears volume risk within this 10% 'deadband' but not beyond it as variations above the 10% 'deadband' are borne by customers.

However, given GAWB's concentrated industrial customer base and the relatively large water consumption of these customers relative to total water supplied, it is not certain that in the event of one or two large customers ceasing operations and disconnecting their water supply, GAWB would be able to fully recover its costs from all remaining customers.

Investment options

Investment options refer to the potential to undertake significant new capital expenditure, particularly in new areas or products. It is argued that businesses that have

a number of valuable investment opportunities in addition to their existing services will tend to have higher systematic risk compared to firms that have limited investment options. In the water utilities sector, these opportunities may be targeted to accommodate increased demand or to improve drought resilience.

Synergies understands that GAWB may consider a number of strategic activities to enhance risk mitigation in coming years. For instance, the 115-kilometre Gladstone-Fitzroy pipeline would facilitate the transfer of 30,000 megalitres of water per annum from the lower Fitzroy River to Gladstone.[26] The cashflows derived from water supplied through these projects, if implemented, are likely to correlate with the economic conditions of the businesses that utilise the pipeline for supply continuity.

Operating leverage

A high degree of operating leverage will increase the volatility of a firm's returns relative to the market, which can increase its beta.[27] However, when compared with the listed water utilities that we have identified, as well as Seqwater, it is unclear whether GAWB's operating leverage would consistently differ materially from these entities.

There are instances though where GAWB may exhibit higher operating leverage than comparable water utilities. The establishment of water connections with the LNG facilities at Curtis Island is an example of a project with high fixed costs, which may be atypical among water utilities with a stronger residential focus. Overall though, the differences in customer base will only marginally manifest themselves through differences in operating leverage.

Conclusion from first principles analysis

Based on the above analysis, we consider that an asset beta equivalent to Seqwater is not commensurate with the systematic risks that GAWB faces in the delivery of water to its customer base:

- GAWB has a highly concentrated industrial customer base, which has been shown to be sensitive to commodity market conditions.
- There are no other aspects of GAWB's services or operations that decrease its systematic risk exposure relative to Seqwater, or to the listed water utilities in the comparator set.

[26] Department of State Development, Manufacturing, Infrastructure and Planning (2019). Gladstone-Fitzroy Pipeline – Project overview.

[27] A higher proportion of fixed costs in the production process means that operating leverage is higher and the firm has more business risk because of its susceptibility to variations in sales.

- A comparison of relative revenue stability between GAWB and Seqwater shows that Seqwater's revenue has been more stable since 2012.

Therefore, based on these observations, we consider that Seqwater's current asset beta of 0.41 forms at best a lower bound for GAWB's asset beta.

3.3.4 Conclusion on asset and equity beta

Our analysis of listed water utilities and mining and industrial services companies formed a range for GAWB's asset beta between 0.45 (based on a sample consisting only of water utilities) and 0.55 (including four relevant mining and industrial services companies). This quantitative analysis was supplemented by a first principles analysis, which qualitatively identified risk factors that suggest GAWB's beta should be higher than that of a conventional water utility, such as Seqwater, with a significant residential customer base. As such, we consider 0.45 denotes a lower bound for GAWB while 0.50 represents a reasonable upper bound.

Therefore, from the range established by listed water utilities and mining services companies, we have applied an asset beta of 0.45 for the purpose of our WACC estimate for GAWB (in Chapter 6). This corresponds to an equity beta of 0.73, assuming a debt beta of 0.12 and 50% gearing.

4 Return on debt

The return on debt calculation can be expressed as follows:

$$R_d = R_f + DRP + DRC$$

Where:

Rf = risk-free rate

DRP = debt risk premium

DRC = debt raising costs

In applying the above return on debt formula, there are several underlying assumptions that are required including in regard to:

- risk-free rate
- notional credit rating assumption
- term to maturity
- debt management approach
- method used to estimate the debt risk premium (DRP)
- assumed debt raising costs.

Each of these assumptions is examined in the following sections.

4.1 Risk-free rate

We have applied the same risk-free rate estimate for the return on equity and the return on debt. As discussed in Section 3.1 of our report, this estimate is 0.94%.

4.2 Notional credit rating assumption

The QCA has previously assumed a BBB benchmark credit rating for GAWB. This is a frequently-applied benchmark for Australian water utilities. IPART, the ESC and ESCOSA all assume a credit rating of BBB for the entities that they regulate. We have not uncovered any evidence that would suggest a change in the credit rating is required.

Very few of GAWB's listed comparators have credit ratings, but those that do are consistent with this assumption (Severn Trent PLC has an S&P credit rating of BBB, while Aqua America Inc has a Moody's rating of Baa2, which is equivalent to BBB. Cia de Saneamento Basico do Estado de Sao Paulo (SABESP) and Companhia de Saneamento do Parana are rated Ba2.)

4.3 Term to maturity

Although the QCA has previously set the term of the risk-free rate equal to the length of the regulatory period, it has usually assumed a 10-year benchmark for the term of debt. In the 2018 final decision for Aurizon Network's UT5, the QCA stated that a 10-year debt term "is consistent with Australian regulatory practice and recognises that utility businesses, in general, will issue debt for longer terms than the regulatory period to manage refinancing risk."[28]

Accordingly, and consistent with our risk-free rate calculation for the return on equity, we have assumed a ten-year term to maturity for BBB bonds, the longest available tenor (with appropriate liquidity) in an Australian context.

4.4 Debt management approach

Cost of debt methodologies applied by Australian economic regulators broadly fall into two categories: on-the-day or trailing average.

The on-the-day approach takes a short-term average of observed corporate bond yields prior to the commencement of the regulatory period. One drawback of this method is that it can be volatile due to short-term fluctuations in market conditions, which is exacerbated when the cost of debt is locked in for the full regulatory period.

On the other hand, the trailing average approach places more weight on historical cost of debt estimates (typically up to 10 years). This methodology emanated from the recognition that, in practice, an efficient debt management strategy for a regulated utility with a significant ongoing funding requirement is to maintain a staggered debt maturity profile and progressively refinance its debt over time.

The QCA has historically applied the on-the-day methodology in its determinations. However, more recently, the QCA has made a series of supportive comments about applying the trailing average methodology. In the 2018 UT5 final decision for Aurizon Network, although only an on-the-day approach was proposed, the QCA stated that:[29]

> The QCA is open to considering alternative regulatory benchmarking debt management approaches (for example a trailing average approach) in future assessments.

[28] QCA (2018a). Aurizon Network's 2017 draft access undertaking, Appendices, December, p.141.

[29] QCA (2018b). Aurizon Network's 2017 draft access undertaking, Decision, December, p.77.

Subsequently, in the April 2019 draft decision for Queensland Rail's 2020 draft access undertaking, Queensland Rail also proposed to apply an on-the-day approach for its undertaking. However, the QCA stated that:[30]

> In considering Queensland Rail's proposal, the QCA is open to considering alternative regulatory debt management strategy benchmarks – should the regulated entity be able to sufficiently demonstrate why such an alternative benchmark strategy is appropriate, having regard to the criteria in s. 138(2) of the QCA Act.
>
> We acknowledge that alternative approaches will yield different cost of debt estimates—for instance, we calculated that an estimate of the cost of debt under a trailing average debt management strategy is 6.38 per cent.[31] However, differences in these estimates will be influenced by the extent to which historical cost of debt calculations are relied upon. The key factor is that the benchmark debt management strategy for setting the cost of debt is an appropriate approach for the regulated entity, having regard to the regulatory and commercial risks involved.

It is important to note that GAWB is subject to price monitoring and is therefore regulated differently from the aforementioned rail entities. The QCA acknowledged in the 2015 final decision for GAWB that it "has the flexibility ex ante to set its cost of debt in any manner it chooses, including using a trailing average approach."[32] In this final decision, the QCA also noted that different cost of debt estimates resulting from either the on-the-day or trailing average methods "should not, by themselves, trigger a cost of service review."[33]

Based on this evidence, and other regulatory precedent around Australia, we consider that both the on-the-day and trailing average methodologies are valid for GAWB to use for the purpose of setting the return on debt for the 2020-25 regulatory period.

4.4.1 Practical considerations for implementing a trailing average

Even if a return on debt approach is deemed appropriate for use, a regulated entity needs to consider how it incorporates its preferred debt management strategy into the WACC that underpins the prices it charges its customers. In Australian regulatory practice, an on-the-day cost of debt estimate is typically maintained for an entire regulatory period.

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30 QCA (2019), p.36.

31 The QCA estimated a 10-year trailing average, using RBA data up to 31 January 2019, to be 6.38% (inclusive of debt refinancing costs).

32 QCA (2015a). Gladstone Area Water Board price monitoring 2015-20, Final report, May, p.52.

33 QCA (2015b). Trailing average cost of debt, Final decision, April, p.23.

In effect, the approach is assuming that the entity reissues its debt in a single transaction, rather than progressively over time, so there is no theoretical requirement to update the WACC on an annual basis.[34] On the other hand, a trailing average cost of debt estimate is typically updated annually, because the methodology is proxying the actual financing practice of a business, which is to refresh a portion of its debt portfolio each year. This is the practice of other economic regulators in Australia such as the AER, the ERA (for gas and electricity) and the ESC for water businesses.[35]

Changes in the WACC from year to year flow through to the setting of prices. This presents a challenge for GAWB's current regulatory framework, including creating some price uncertainty for its customers. Currently, prices are set at the start of each regulatory period and only increased by CPI within-period. If prices are not adjusted beyond CPI changes during the regulatory period, this would potentially introduce an additional layer of uncertainty for customers as a revenue 'true up' would need to occur at the start of each regulatory period.

4.5 DRP methodology

Once the overarching return on debt approach has been selected, the precise methodology needs to be established. One of the primary considerations is the data underpinning the calculation.

The QCA has historically used a portfolio econometric-based methodology to estimate the return on debt. This involves data filtering in order to form an appropriate portfolio of bonds for the entity under assessment. However, in its 2018 final decision for Aurizon Network's UT5, the QCA had regard to an average of RBA and Bloomberg data when applying a discretionary adjustment to its "bottom-up" WACC assessment. Subsequently, the QCA used this approach explicitly in its 2019 draft decision for Queensland Rail.

In order to assess the impacts of utilising third-party data sources, the QCA compared the outputs from RBA and Bloomberg data with its own econometric outputs from previous determinations that it has handed down since 2013. From this exercise, the QCA did not consider that differences between the approaches were biased in any particular direction. Moreover, the QCA acknowledged that the use of third-party

[34] The ERA updates its rail WACC estimates annually, even though it adopts an on-the-day approach for the entities that it regulates. However, the ERA also undertakes a comprehensive annual update of all market-influenced parameters (risk-free rate, MRP, return on debt).

[35] IPART indicated in its most recent WACC methodology review that it will decide on a case-by-case basis whether the annual changes in the cost of debt will flow through to prices in the subsequent year, or whether they will be cumulated and passed through via a true-up in the subsequent regulatory period.

estimates was "common across the Australian regulatory landscape."[36] The ACCC, AER, ESC, ESCOSA and IPART all use either RBA and/or Bloomberg data.[37]

We continue to hold the view that the use of independent third-party data sources that are reputable and robust is appropriate for calculating the return on debt. We believe that the RBA and Bloomberg data sources meet these criteria, and in line with most Australian regulators we have used them in our calculations for GAWB. Moreover, this approach is more readily replicable by stakeholders, which provides greater transparency regarding the resulting return on debt estimate.

4.5.1 Indicative trailing average estimate for GAWB

Although we apply an on-the-day methodology for GAWB in this WACC assessment, for illustrative purposes, we have prepared a trailing average estimate of the cost of debt. Consistent with the approach the QCA applied in its Queensland Rail 2019 draft decision, we have relied entirely on RBA data, because there are gaps in the Bloomberg data over a 10-year timeframe. The resulting estimate is 6.18%. This compares with the QCA estimate of 6.38% from January 2019 cited above.

4.6 Debt raising costs

We have included a debt refinancing transaction cost allowance of 0.108 per cent (or 10.8 basis points per annum). This is consistent with the value most recently used by the QCA in Queensland Rail's 2019 draft decision.

Furthermore, because the term to maturity of the risk-free rate and the term of the benchmark debt are now identical, an efficient debt management strategy would not require interest rate swap contracts that convert the interest rate element of the cost of debt from its actual term to a term that matches the length of the regulatory period. As a result, we have not applied any allowance for debt swap costs in our estimate for GAWB. This is also consistent with the practice of the QCA in its Queensland Rail 2019 draft decision, where it no longer made an allowance for swap costs.

4.7 Conclusion

One of the major debates surrounding the cost of debt in a regulatory setting has been the choice between on-the-day and trailing average approaches. Given its broad

[36] QCA (2019), p.35.

[37] In its 2018 Rate of Return Guideline review, the AER considered the merits of incorporating data from Thomson Reuters and S&P Global in its return on debt estimate. The AER opted to include Thomson Reuters data, but chose not to rely on data from S&P Global. Analysis by the AER suggests that the difference in estimated yields with and without the Thomson Reuters data is virtually indistinguishable.

acceptance and implementation by various Australian regulators, as well as its robust theoretical motivations, we consider that it would be appropriate for GAWB to adopt a trailing average for informing its WACC for the 2020-25 regulatory period.

However, there are practical limitations to its use in the context of price setting, especially if there is a preference for prices to be locked in for a regulatory period. For this reason and based on GAWB's guidance, we have used an on-the-day estimate for GAWB. Although we have not applied a trailing average in the final WACC estimate, GAWB should continue monitoring developments in this area, and may need to revisit its choice of methodology at a future review.

Assuming a risk-free rate of 0.94% and debt raising costs of 10.8 bppa gives an on-the-day cost of debt estimate of 3.10%. Table 6 indicates the basis of this calculation.

Table 6 2019 on-the-day cost of debt calculation

Averaging period	RBA	Bloomberg	Average
BBB DRP based on 20 days to 30 August 2019	2.23%	1.86%	2.05%
Risk-free rate based on 20 days to 30 August 2019	0.94%	0.94%	0.94%
Debt raising costs	0.108%	0.108%	0.108%
2019 on-the-day cost of debt	**3.28%**	**2.91%**	**3.10%**

Source: RBA, Bloomberg, Synergies calculations

5 Gamma

Gamma (γ) is the value of imputation credits to investors in a business, where some part of corporate tax paid by this entity can be claimed as a tax credit against personal income tax. To the extent it can be accessed by investors, it forms part of the assumed equity return to investors.

Gamma is the product of two inputs which must be estimated:

- the proportion of tax paid that has been distributed to shareholders as franking credits (the distribution rate); and
- the value the marginal investor places on $1 of franking credits, referred to as the value of distributed franking credits (or theta).

Gamma must take a value between zero and one depending on the assumptions made in regards to the distribution rate and theta.

5.1 Distribution rate

The QCA has applied a distribution rate of 0.88 in its most recent decisions for Aurizon Network and Queensland Rail. This was based on the average distribution rate of the top 20 companies on the ASX by market capitalisation. (Dr Martin Lally, the author of this analysis, has also prepared similar analysis for the AER and ERA using the top 50 companies on the ASX.) Recent consultation processes undertaken by the AER and ERA have raised a number of concerns with this approach.[38] The issues include that:

- The 20 firms do not form an appropriate benchmark for most Australian regulated entities - although this argument has primarily been made in relation to energy networks and railroads, this concern in our view is also applicable to GAWB, a water utility with an industrial customer base.
- The methodology relies on the use of franking account balances – this is one of the main criticisms of the taxation statistics approach, which the QCA has previously excluded from its gamma methodology.
- The distribution rate for listed firms can be distorted by the presence of foreign profits – this is especially problematic for GAWB, which derives no revenue from outside of Australia.

[38] See, for example, the AER 2018 Rate of Return Guideline Review; the ERA 2018 Gas Rate of Return Guidelines Review; and the ERA 2018 Rail WACC Methodology Review.

The consequences of error are amplified by the fact that the QCA has regard to only a single source of evidence in regard to the distribution rate. Even if an approach relying on the top 20 (or 50) firms is to be pursued, this should be undertaken in conjunction with broader estimates of the distribution rate, which typically provide estimates closer to 70%.

Moreover, although the QCA has previously expressed a preference for distribution rates informed solely by listed equity, in our view giving weight to distribution rates based on unlisted equity, as has been the practice of other Australian regulators, would enhance the robustness of the estimate.

5.2 Theta

The QCA currently applies a theta of 0.55, which it states is based primarily on the equity ownership of Australian listed companies. Any residual consideration given to other approaches is not made explicit. As a non-market utilisation approach, the equity ownership method focuses more on the proportion of credits that are redeemed. Non-market approaches typically result in a higher theta, and therefore gamma (lowering the return on equity). The equity ownership approach overlooks various reasons why even domestic investors, rather than simply foreign investors, may not value credits at their face value (such as the 45 day rule), causing the approach to provide at best an upper bound for gamma, rather than a point estimate.

Concerns have also been raised about the integrity of the data underpinning the equity ownership approach. We acknowledge that virtually all gamma approaches are subject to some form of uncertainty in relation to data, but the risks of poor data are heightened if significant weight is placed on a single approach, to the exclusion of other theoretically and empirically sound approaches.

The equity ownership is not the only non-market approach that can be used to inform gamma. The taxation statistics approach employs data from the Australian Tax Office (ATO) to calculate the proportion of imputation credits that are redeemed by investors. While also an example of a non-market approach, the advantages of the taxation statistics approach are that it is conceptually intuitive and estimates directly the proportion of imputation credits redeemed.

In contrast, the equity ownership approach can only be considered an indirect estimate. It will successfully account for non-resident effects but will not capture any other reasons why imputation credits may be valued at less than their face value. This is likely to be one of the reasons why gamma estimates based on the equity ownership approach tend to be higher than those based on the taxation statistics approach.

The taxation statistics methodology allows for two ways of deriving the distribution rate, relying either on franking account balances or the flow of dividend payments. While both paths ultimately lead to the same gamma estimate, they lead to differing estimates of the distribution rate and theta. It is possible to perform most WACC-related calculations using only an overall estimate of gamma, but delineated estimates of distribution rate and theta are still required, such as for calculating imputation adjustments to the MRP, which depends exclusively on theta.

The key unresolved issue is the divergence between the value of imputation credits as measured by taxation statistics (approximately 0.31 based on most recently available data) and the QCA's current parameter assumption guided by the equity ownership approach (0.484). Even if there is uncertainty about the value of the distribution rate derived from ATO data, this does not adequately explain the disparate overall gamma estimates. Put differently, even if the distribution rate is 100% or 1, gamma is the product of the distribution rate and theta, so taxation statistics (which depend only on basic measures of tax collected and credits redeemed by taxpayers) infer it is not possible for theta to be any higher than 0.31. This stands in stark contrast to the QCA's current theta assumption of 0.55.

Dr Martin Lally, who has previously advised the QCA on gamma, wrote in a submission for the AER that the difference can be attributed at least in part to the following phenomenon:[39]

> The ATO data includes firms that made profits and thereby generated credits but then made losses and liquidated without distributing the credits. Such firms would tend to have low distribution rates and, as with unlisted firms, would not be suitable for estimating the distribution rate for the BEE [Benchmark Efficient Entity].

In our view, this explanation is not implausible, but it has not been substantiated and it is unclear whether this factor alone is sufficient to explain the substantial difference in gamma values implied by competing non-market methods.

5.2.1 Other approaches to theta

The approaches discussed up until this point are all classified as non-market approaches.

In contrast, market value studies seek to ascribe the value that investors place on theta using techniques such as dividend 'drop-off' studies, which involve analysing pre- and post-dividend share prices. In the most recent dividend drop-off study, Cannavan and Gray (2017) employ an extended dataset with improved econometric techniques in order

[39] Lally, M. (2018). The estimation of gamma: Review of recent evidence, 14 December, p.9.

to assess the value of imputation credits. Their results reinforce earlier findings that the market values distributed imputation credits at approximately 35% of the face value (i.e. theta = 0.35). This estimate of theta is consistent with a value for gamma of 0.25, assuming a distribution rate of 70%. Furthermore, IPART makes specific reference to this paper in substantiating its decision to retain a gamma estimate of 0.25.[40]

Academic research analysing market data also indicates strong support for a gamma value of zero based on the assumption that in open capital markets like Australia, the marginal investor will be an international investor who gains no value from imputation credits and hence whose expected return on equity is not affected by the operation of the Australian tax imputation system.

5.3 Conclusion on gamma

The evidence presented in this chapter strongly suggests that the QCA has over-estimated both the distribution rate and theta, attributable to both conceptual and data-related shortcomings. The product of these parameters leads to a gamma assumption that overstates the value of imputation credits, thereby reducing the return on equity. We consider that the QCA should further consider these issues as part of the 2020 price review.

However, for the purpose of developing a preliminary WACC estimate for GAWB, we have adopted the QCA's current methodology and applied a gamma of 0.484 (based on a distribution rate of 0.88 and a theta of 0.55).

We recommend that GAWB should continue to monitor developments in Australian regulatory approaches to valuing imputation credits and re-evaluate its position at future price reviews accordingly.

[40] IPART (2018). Review of our WACC method, February, p.83.

6 Preliminary WACC estimate

Our preliminary WACC estimate for GAWB of 4.57% for the 2020-25 regulatory period is presented in Table 7.

This preliminary WACC estimate is considerably lower than the WACC that has been applied during GAWB's current regulatory period, largely reflecting decreases in market parameters, particularly the risk-free rate, which flow through to both the return on equity and debt.

Table 7 Comparison of 2015 and 2019 WACC estimates

Parameter	2015 decision	2019 submission
Risk-free rate	1.92%	0.94%
EQUITY PARAMETERS		
Asset beta	0.40	0.45
Equity beta	0.64	0.73
Market risk premium	6.5%	7.0%
Cost of equity	**6.11%**	**6.04%**
DEBT PARAMETERS		
Debt risk premium (raw)	2.59%	2.05%
Debt issuing costs	0.108%	0.108%
Debt swap costs	0.100%	0.000%
Debt risk premium (total)	2.798%	2.158%
Cost of debt	**4.72%**	**3.10%**
Capital structure (% debt)	50%	50%
Post-tax nominal vanilla WACC (WACC3)	**5.41%**	**4.57%**
LEVERING / TAX PARAMETERS		
Debt / equity ratio	1.00	1.00
Debt beta	0.11	0.12
Statutory corporate tax rate	30%	30%
Utilisation rate	0.56	0.55
Distribution rate	0.84	0.88
Gamma	0.47	0.484
Imputation-adjusted tax rate	15.89%	15.48%

Source: Synergies analysis, QCA decisions

Our preliminary WACC estimate will need to be updated to reflect changes in market parameter values close to the commencement of GAWB's 2020-25 regulatory period.