SunWater
MAKING WATER WORK

QCA review of irrigation prices

Weighted Average Cost of Capital - Renewals Annuity Background Paper

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Contents

1 Introduction

The Queensland Competition Authority (QCA) is to recommend prices for SunWater's irrigation customers. The QCA is required to calculate a renewals annuity to recover future expenditure for asset replacement and refurbishment. The calculation of a renewals annuity requires the net present value of the forecast expenditure to be determined, and then annuitised. A discount rate is required as part of this calculation, and SunWater proposes to adopt an estimate of the Weighted Average Cost of Capital (WACC) for this purpose.

This WACC will also be used over the regulatory period in accounting for the Asset Restoration Reserve (ARR). SunWater proposes to apply interest to the ARR balances at the same rate as the WACC used to calculate the annuity.

The renewals annuity and consequently irrigation prices are not overly sensitive to the discount rate used for the renewals annuity calculation. Accordingly SunWater has not undertaken a rigorous review of WACC. For example, in relation to parameters such as beta, the assessment has been primarily influenced by regulatory precedent. SunWater does not necessarily agree with this precedent and reserves the right to undertake a more fulsome analysis and submission in the event that WACC is to be determined to calculate a rate of return on existing, new or augmented assets.

The purpose of this background paper is to describe the rationale for the assumptions underpinning the WACC estimate. It is structured as follows:

- section 2 reviews the application of a single or multiple rates of return to SunWater's schemes
- section 3 examines the risk-free rate
- section 4 examines the cost of debt
- section 5 considers capital structure
- section 6 assesses beta
- section 7 examines the other parameters
- section 8 concludes with the proposed WACC estimate.

2 Single or multiple rates of return

The QCA commissioned a report by NERA to examine the question of whether a single or multiple rates of return should be applied to SunWater's assets.[1] NERA's analysis assumed that any differences in the rate of return would primarily be reflected in the beta parameter, which will determine the cost of equity. It also examined the notional credit rating, which will influence the cost of debt. SunWater concurs that any differences would primarily be reflected in beta and to a lesser extent, capital structure and the notional credit rating.

In examining beta, NERA undertook a first principles analysis, which examines a number of factors that are recognised as being key drivers of systematic or non-diversifiable risk.[2] It concluded that to the extent that there were any differences between the systematic risk profile of different customer segments, services provided to industrial (and 'other') customers are likely to be riskier than services provided to irrigation or urban customers. The primary reason for this is that demand by industrial (and 'other') customers will be more sensitive to domestic economic activity, which is the key concern when assessing systematic risk. It identified three customer groups that had a higher exposure to industrial and 'other' customers, being Bowen Broken Rivers, Boyne River and Tarong and Macintyre Brook.

NERA considered that in order for any differences in beta to be warranted, two conditions must be satisfied. The first is that the risks must be materially different. SunWater concurs with this assessment. For example, NERA stated that a case could be made for distinguishing between a business that primarily serviced residential users and one that almost exclusively serviced industrial customers, but not necessarily businesses servicing different mixes of these customers.

NERA's second condition is that there must be a basis for being able to objectively establish the extent of any differences. NERA therefore concludes that while there may be a case to distinguish between the risk profile of business segments, a lack of data means that there is no basis to objectively establish the extent of the differences.

If there is a material difference in risk between different assets or businesses, SunWater does not agree that no distinction should be drawn unless that difference can be objectively established, where "objective" is assumed to mean quantification (as references are made to the lack of financial data). The estimation of beta and other

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[1] NERA Economic Consulting (2010). Single or Multiple Rates of Return: SunWater, A Report for the Queensland Competition Authority, 30 August.

[2] These factors include: the nature of the product or service, the nature of the customer, regulatory framework, growth options, market weight, duration of contracts and degree of monopoly power.

WACC parameters is inherently uncertain. It is extremely difficult to quantify the impact of differences in a number of key risk factors on beta, however that does not mean that the same beta should be applied if those differences are sufficiently material.

Ideally, this could be done by identifying listed comparators that replicate the different risk profiles (for example, a water business that primarily serviced industrial companies and one that primarily serviced residential users) and observe the differences in beta between these companies. However, the limited availability of suitable comparators (and data of an appropriate quality) often precludes such an analysis.

Noting that comparable companies analysis typically establishes a range of estimates within which the betas of the identified companies fall, one way of adjusting for risk differences is to select the betas from different points within that range. For example, the beta of a business that primarily services industrial customers would be selected from the upper bound. The beta of a business that primarily services residential customers may be selected from the mid-point or lower bound. Such an approach is not a precise adjustment however it serves as a proxy for the differences in risk.

Overall, SunWater agrees with NERA's first condition, which is that differences in risk must be material. SunWater does not agree, however, that the differences must be able to be "objectively established" or measured using financial data. SunWater also agrees that currently, the three identified schemes that primarily service industrial customers are likely to have a different risk profile to SunWater's other schemes. In order to determine whether the application of a different beta is warranted, consideration will need to be given to the extent to which that industrial demand is correlated with domestic economic activity. That is examined further as part of the discussion on beta in section 6.

3 Risk-free rate

In its decision in relation to QR Network the QCA changed its practice of basing the risk-free rate on a ten year term to maturity to a term that matches the horizon of the regulatory period. The same approach was also applied in the QCA's Gladstone Area Water Board's (GAWB's) 2010 pricing decision.

SunWater does not agree with this approach. First, it considers that the use of a ten year rate is consistent with the long-term horizon of investors in regulated assets. Second, it exposes the business to refinancing risk as it assumes that it will refinance all of its debt at the end of each regulatory period.

In its June 2010 pricing decision for QR Network[3], the QCA acknowledged that the use of a five year term to maturity could result in the business incurring refinancing costs. It has therefore proposed to include an additional margin for these costs. This is discussed below as part of the consideration of the debt margin.

In SunWater's opinion, the risk-free rate should continue to be estimated based on a ten year term to maturity. This is consistent with the long-term, forward-looking horizon of investors in regulated assets.

Regulation should not drive commercial behaviour. In order to minimise interest rate and refinancing risk, the 'optimal' strategy if a five year term to maturity is assumed is to refinance the entire debt portfolio at each regulatory reset (as this assumption also affects the cost of debt). Businesses should be able to manage their debt portfolios based on prudent commercial practice – for an owner of infrastructure assets this will be to fund for as long as possible (recognising that this is more difficult at the current time).

To the extent that the QCA's approach is to drive this behaviour, it is important that the businesses are reasonably compensated for the refinancing costs (which is included as part of the cost of debt, as discussed below). In order to avoid these costs – and more importantly, to avoid regulation driving commercial behaviours – the preferred approach would be to simply use a ten year term to maturity to derive the risk-free rate and debt margin.

For the purpose of setting the WACC for calculating the renewals annuity a ten year term to maturity has therefore been applied. The twenty day average of the ten year Commonwealth Government bond yield to 30 November 2010 was 5.41%. This rate was adopted for calculating the renewals annuities as presented in Network Service Plans submitted to the QCA.

[3] Queensland Competition Authority (2010). Draft Decision, QR Network's 2010 DAU – Tariffs and Schedule F, June.

4 Cost of debt

The key issue associated with the estimation of the cost of debt is the term to maturity. This was addressed above. SunWater does not agree with the use of a five year term to maturity and considers that a ten year term should continue to be applied.

4.1 Estimating a ten year BBB yield

If a ten year term to maturity was adopted, a decision would need to be made as to how to estimate a ten year BBB yield, given the significant liquidity issues affecting the corporate bond market. More recently, in order to estimate a ten year BBB yield, the QCA and other Australian regulators had extrapolated the Bloomberg seven year BBB yield based on the difference between the seven and ten year AAA corporate bond yields (the QCA had applied this as part of estimating the credit default swap 'proxy', which will be discussed below).

Since the GAWB determination was made, Bloomberg ceased publication of the necessary AAA corporate bond yields. An alternative approach to estimate a Bloomberg ten year BBB yield is to use the term structure for the five to seven year terms for the same yield curve. This assumes that the slope of the yield curve from five to seven years is the same as for seven years to ten years. This is one of the only approaches that can be applied given the lack of market data and SunWater considers that it is a sound approach.

4.2 Inclusion of an allowance for refinancing costs

As SunWater has proposed to use a ten year term to maturity to estimate the cost of debt an allowance for refinancing costs has not been included.

If the QCA is to continue to apply a five year term to maturity to estimate the cost of debt it should also continue to compensate businesses for the appropriate refinancing costs. If the 'credit default swap proxy' was to be re-estimated using current market data (which would be the most appropriate approach), the ten year BBB yield could be estimated by extrapolating the seven year BBB yield based on the difference between the five and seven year yields, as discussed above.

4.3 Debt raising costs

The QCA continues to include an allowance of 0.125% per annum for debt raising costs (in addition to the allowance for refinancing costs). SunWater has therefore applied this allowance to estimate the cost of debt.

4.4 Conclusion: cost of debt

SunWater has estimated a ten year cost of debt for the purpose of setting the indicative WACC to calculate the renewals annuity.

The debt margin has been estimated by extrapolating Bloomberg's seven year BBB yield based on the difference between the five and seven year BBB yields. The yields were averaged over the twenty day period to 30 November 2010. The resulting estimate is 5.42%. Added to this isdebt raising costs of 0.125% per annum.

Added to the ten year risk-free rate estimated in section 3, the cost of debt is 10.96%.

5 Capital structure

The appropriate capital structure or gearing level is a function of both industry-wide and business-specific factors.

In 2003 the QCA determined a gearing level of 50% (debt to total value) for the Burdekin Haughton scheme. More recently, it applied the same assumption to GAWB. SunWater observes that in other jurisdictions, some regulators have applied values of up to 60%, which is more consistent with energy decisions (refer section 6.1.3). However, SunWater is not of the opinion that assets primarily servicing irrigation customers would have the same debt capacity as a gas or electricity business.

SunWater therefore considers that 50% is an appropriate capital structure. This is also considered to remain compatible with a BBB credit rating, which was applied by the QCA for both the Burdekin Haughton scheme and GAWB.

6 Beta

Regulatory determinations on beta tend to be heavily influenced by precedent. For example, in the case of the recent GAWB decision the QCA's focus was on whether the systematic risk profile of the business had changed since the previous determination was made. It also took this position in its review of QR Network.

SunWater does not necessarily agree that the focus should be limited in this way. Apart from the presumption that betas will remain stable through time, it also assumes that the previous determination was appropriate.

However, with these concerns in mind, SunWater has considered this issue in the context of the beta determined for the Burdekin Haughton water supply scheme in 2003, as well as the most recent determination made for GAWB, while also having regarding to other Australian regulatory precedent in the water industry.

6.1 Regulatory precedent

6.1.1 Burdekin Haughton scheme

In its Final Report in relation to the Burdekin Haughton scheme, the QCA noted that there was a lack of observable market data for rural water businesses. It stated that in the absence of this data, reference could be made to international comparators (which was seen as problematic) and other Australian regulatory decisions.

The QCA observed the beta parameters determined across a number of Australian regulatory decisions in different industries. It also looked at data from overseas comparators (submitted by Sunwater). It concluded that an asset beta range for the water industry of between 0.3 and 0.45 was appropriate.

It noted that all of the Australian regulatory precedent in water was for urban utilities, or businesses that exclusively supply urban or industrial customers. It considered that returns in the rural sector are more likely to be influenced by climatic factors and conditions in international commodity markets (particularly sugar). Further, in the case of the Burdekin Haughton scheme, revenues can be expected to be stable "given the low variation in the water required to irrigate sugarcane." It therefore concluded that the beta should be at the lower end of the range, arriving at an asset beta of 0.35. At a gearing level of 50% and a debt beta of 0.3, this resulted in an equity beta of 0.4.

6.1.2 GAWB

The QCA published its Final Decision for GAWB in June 2010. As outlined above, in this review the QCA focussed its consideration on whether there had been any material change in risk since the previous determination was made in 2005.

In the 2005 determination the QCA generally considered that GAWB's systematic risk was low. It stated that:[4]

> GAWB faces a relatively low risk environment due to the low level of technology risk, absence of reasonably priced substitutes, and the essential nature of water as a commodity, including its uses for sustaining life and as a reasonably priced cooling agent. It is the affordability of GAWB's water that ensures substitutes are unlikely to pose an immediate or medium term threat to its provision of water services.

It also considered that GAWB's returns were not highly correlated with domestic market returns, largely because the demand from its key industrial customer, QAL, is correlated to the international market for alumina.

In 2010 it concluded that there had been no material change in risk and determined to retain an equity beta of 0.65.

6.1.3 Other regulatory decisions in water industry

Other Australian regulatory decisions in the water industry have been examined. In most cases an equity beta has been published. Caution needs to be exercised in directly comparing equity betas to the extent that there are differences in gearing, the levering/delevering method and the debt beta assumption (the debt beta is discussed below). Reference has been made to the most recent determinations available.

Table 1: Equity betas from other Australian regulatory decisions in water industry

Decision	Equity beta	Gearing
New South Wales (Independent Pricing and Regulatory Tribunal, 2008-2010) – bulk and metropolitan water pricing : Gosford City Council, Wyong Shire Council, Sydney Catchment Authority, Sydney Water Corporation, State Water Corporation	0.8-1.0	60%
Metropolitan Me bourne (Essential Services Commission, 2009)	0.65	60%
Victorian Regional and Rural Businesses' Water Plans and Me bourne Water's Drainage and Waterway's water plans (Essential Services Commission, 2008)	0.65	60%
Water Corporation, Aqwest and Busselton Water (Economic Regulation Authority, 2009)	0.65	Water Corporation: 60% Water Boards: 40%
South Australia Potable Water and Sewerage Prices (Essential Services Commission of South Australia, 2010)	0.6 – 1.0	50% - 60%

[4] Queensland Competition Authority (2005). Final Report, Gladstone Area Water Board: Investigation of Pricing Practices, March, p.123.

Many of these decisions relate to pricing urban water services. In Victorian and Western Australia, equity betas of 0.65 have been determined, with a higher gearing level (with the exception of the Western Australian Water Boards, where a gearing level of 40% was adopted). New South Wales and South Australia have applied higher equity betas (a mid-point of 0.9 in New South Wales with 60% gearing and 0.8 in South Australia with 55% gearing).

6.2 Implications for SunWater's irrigation assets

6.2.1 Is there a material difference in systematic risk between SunWater's industrial and non-industrial customers?

As discussed above, as part of its consideration of the application of single or multiple rates of return, NERA undertook a first principles analysis to assist in establishing the extent to which there might be differences in systematic risk.

One of the most important factors that is considered as part of this analysis is the nature of the product or service. While examination of the other factors, including pricing structure, regulatory regime, degree of market power, growth options and operating leverage is important, the implications of these factors may not be materially different from other regulated water businesses.

NERA observed that demand from irrigation customers whose usage is dependent on the availability of water is likely to be less correlated with domestic economic activity. NERA stated that demand from customers that have high priority entitlements (typically urban, industrial and other customer groups) will be more correlated with the demand for their end-use application. Based on an analysis of the split between irrigation and non-irrigation demand for each scheme, NERA noted that some schemes would have a below-average asset beta, some would have an average asset beta and others would have an above-average asset beta.

NERA then considered the nature of the end-use demand by each sector and its correlation with domestic economic activity. It concluded that:

- demand by the residential sector will be less sensitive to domestic economic activity given water is a necessity;
- demand by the commercial sector will have more sensitivity to domestic economic activity, although their demand is still likely to have the characteristics of a necessity good;
- demand by industrial customers is primarily for electricity generation. This is assumed to have "average" levels of non-diversifiable risk.

As outlined previously, SunWater considers that to the extent that the difference in systematic risk between industrial customers and other customers was considered material, it may warrant the application of a different beta, even if this cannot be 'objectively' quantified using market data.

The electricity generation customers will in turn service a mix of residential, commercial and industrial customers. The drivers of the underlying demand for each of those segments are not dissimilar to the demand for water. That is, residential use will have less correlation with domestic and economic activity compared to commercial and industrial use.

It should also be noted that some of the industrial customers serviced are in the mining industry. These businesses will have a different risk profile to an electricity generation business. However, currently their demand does not predominantly drive the risk profile of any one scheme. This may change where schemes are established that mainly service mining companies (which is currently being examined).

Overall, SunWater therefore concurs with NERA that on balance, its existing industrial demand will have an 'average' correlation with domestic economic activity. It is not necessarily sufficiently material to warrant the application of a different beta between water supply schemes at the current time.

This contrasts with the situation where that industrial demand comprises customers whose activities were more directly correlated with domestic economic activity, which would warrant a higher beta. That may be the case for new schemes established in future, particularly those schemes that will mainly service mining customers.

6.2.2 Is there a material difference in risk between the systematic risk of SunWater's irrigation assets and other water businesses?

As noted above, many of the determinations made in the water industry in Australia have been for urban or metropolitan customers. NERA considers that the risk profile of the residential sector will be less sensitive to domestic economic activity. The QCA drew a similar conclusion for GAWB, although for different reasons. In that case, its industrial demand base was seen to be less correlated with domestic economic activity.

Demand for water for irrigation purposes will be less sensitive to economic activity particularly where that demand depends on the availability of water. However, it is not clear that this systematic risk profile is different from a water business that predominantly services residential customers. It is also not clear that this systematic risk profile is any different from GAWB's (based on the QCA's conclusions), even if the drivers of the assumed lower correlation with domestic economic activity are different. It is noted that in its report, NERA did not distinguish between irrigation and urban customers.

On this basis, SunWater has proposed an equity beta of 0.65, which is consistent with the GAWB decision. This remains lower than the determinations made for water businesses in New South Wales and South Australia (after differences in gearing are taken into account).

6.3 Conclusion: beta

SunWater is therefore proposing an equity beta of 0.65.

7 Other parameters

7.1 Market risk premium

SunWater observes the Australian Energy Regulator's decision to apply a market risk premium of 6.5% following the commencement of the global financial crisis. It also notes that the QCA has maintained a value of 6% in its recent determinations for QR Network and GAWB, which at least partly appears to be in the interests of regulatory stability.

SunWater has therefore applied a market risk premium of 6%.

7.2 Gamma

As this WACC is being determined to calculate a pre-tax real annuity, the treatment of gamma does not have as material an impact. For simplification purposes, SunWater has therefore set the value of gamma at zero.

8 Conclusion: Proposed WACC Estimate

In conclusion, SunWater's proposed WACC that it will apply in calculating the renewals annuity for its irrigation assets is summarised below. The risk-free rate and debt margin estimates have been averaged over the twenty business days to 30 November 2010.

Table 2: Proposed WACC estimate

Parameter	Value
Risk-free rate	5.41%
Debt margin	5.42%
Debt raising costs	0.125%
Debt to total value	50%
Equity beta	0.65[5]
Market risk premium	6%
Gamma	0
Inflation	2.5%
Corporate tax rate	30%
Cost of debt	10.96%
Cost of equity	9.29%
Post-tax nominal (vanilla) WACC	10.12%
Pre-tax real WACC	9.38%

SunWater observes that the cost of debt is higher than the cost of equity. This is inconsistent with finance theory and practice. However, it is also noted that such an outcome was determined by the QCA for GAWB.[6]

The cost of debt reflects current market data. The key driver of the increase is the debt margin, which has increased materially following the commencement of the global financial crisis. The cost of equity, on the other hand, reflects longer term regulatory precedent. These values have not been adjusted to account for the possible impacts of the global financial crisis. In particular, the QCA has previously determined that it will not adjust the market risk premium from its longer term value of 6%.

SunWater accepts that the QCA does not propose to change the value of parameters such as the market risk premium in the interests of longer term regulatory stability. However, a possible consequence of this is that the regulated cost of equity is below the cost prevailing in the market.

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[5] The calculated equity beta for GAWB based on the QCA's parameters was 0.6465. While this does not make a material difference this has been used for consistency.

[6] GAWB's final cost of equity was 9.06% and its cost of debt was 9.86%.