Queensland Competition Authority

Request for comments

Rate of return review

November 2020

SUBMISSIONS

Public involvement is an important element of the decision-making processes of the Queensland Competition Authority (QCA). Therefore, submissions are invited from interested parties concerning our assessment of rate of return matters. The QCA will take account of all submissions received within the stated timeframes.

Submissions, comments or inquiries regarding this paper should be directed to:

Queensland Competition Authority
GPO Box 2257
Brisbane Q 4001

Tel (07) 3222 555
Fax (07) 3222 0599
www.qca.org.au/submissions

Confidentiality

In the interests of transparency and to promote informed discussion and consultation, the QCA intends to make all submissions publicly available. However, if a person making a submission believes that information in the submission is confidential, that person should claim confidentiality in respect of the document (or the relevant part of the document) at the time the submission is given to the QCA and state the basis for the confidentiality claim.

The assessment of confidentiality claims will be made by the QCA in accordance with the *Queensland Competition Authority Act 1997*, including an assessment of whether disclosure of the information would damage the person's commercial activities and considerations of the public interest.

Claims for confidentiality should be clearly noted on the front page of the submission. The relevant sections of the submission should also be marked as confidential, so that the remainder of the document can be made publicly available. It would also be appreciated if two versions of the submission (i.e. a complete version and another excising confidential information) could be provided.

A confidentiality claim template is available on request. We encourage stakeholders to use this template when making confidentiality claims. The confidentiality claim template provides guidance on the type of information that would assist our assessment of claims for confidentiality.

Public access to submissions

Subject to any confidentiality constraints, submissions will be available for public inspection at our Brisbane office, or on our website at www.qca.org.au. If you experience any difficulty gaining access to documents please contact us on (07) 3222 0555.

REQUEST FOR COMMENTS

The publication of this Request for Comments paper marks the beginning of our consultation process to review our future approach to determining reasonable rates of return for the businesses we regulate (broadly defined).

The rate of return is the return expected by investors to compensate them for investing their capital in a firm.

Determining reasonable rates of return for regulated entities requires careful consideration of all available, relevant evidence in the presence of uncertainty. In many instances we are required to exercise judgement, particularly where there is conflicting evidence relating to: statistical techniques and outcomes; contemporary market data; and our degree of confidence in the final result.

We are reviewing our approach to determining reasonable rates of return for regulated entities that may be subject to assessment we undertake. Such assessments could take the form of:

- investigations into pricing practices relating to certain monopoly business activities

- price monitoring investigations

- assessment of draft access undertakings

- determination of access disputes or other pricing determinations.

Determining a rate of return is an important aspect of economic regulation, as it can have major impacts on the revenues of regulated entities and on prices paid by their customers.

We are also aware that our approach to determining rates of return can have detrimental impacts.

- If the rate of return is *too low*, it could have a chilling effect on investment leading to inadequate capacity and/or service quality and potentially reduce revenues to the point where the financial sustainability of a regulated entity is endangered.

- Conversely, if the rate of return is *too high*, a regulated entity could be encouraged to over-invest, leading to inefficient capital allocation in the economy and higher prices that could reduce consumer welfare or discourage investment in dependent markets.

It is therefore important that we carefully consider the issues that impact on our approach to determining rates of return.

This review process is being undertaken to review approaches to determining reasonable rates of return. This may include approaches, models, methods and statistical techniques. Our preliminary views will be presented in a draft report, which will afford interested parties the opportunity to comment before we release our final report. This process is intended to be completed by 30 June 2021.

Invitation for submissions

We invite submissions on any aspect relating to the consideration of rate of return matters by **14 December 2020**. Interested parties may also wish to comment on the degree of consistency between our previous rate of return decisions and alternative approaches employed by other economic regulators.

We also invite written comments on this document and encourage all interested parties to provide submissions addressing the matters discussed.

Contacts

Enquiries regarding this project should be directed to:

ATTN: Russell Silver-Thomas
Tel (07) 3222 0555
www.qca.org.au/contact

Introduction

We recognise that there are a number of approaches, models and estimation techniques that may be used to determine a rate of return that applies to regulated entities. Unfortunately, there is no single correct approach, model, or estimation technique—as such, our regulatory judgement involves considerations of their respective strengths and weaknesses.

We have prepared this Request for Comments paper for the purpose of obtaining stakeholder views, with a focus on the following matters:

- the approach to assessing the reasonableness of the overall rate or return

- the cost of debt (debt management strategy), and in particular, implementing a trailing average debt management strategy (Questions 2 to 7 and 11 to 13)

- beta, including how far back in time we look to estimate beta, and the frequency of the data observations (Questions 14 to 16).

We seek stakeholder comments to help inform our view on these matters and other rate of return matters.

Weighted average cost of capital (WACC)

In Australian regulatory practice, the most common approach to determine rates of return is the weighted average cost of capital (WACC). This is an artificial construct which requires an assessment by the regulator of what would be a reasonable rate of return for the regulated firm given the firm and industry characteristics.

The WACC is the weighted average of a firm's estimated costs of equity and debt and is the estimated or expected rate of return on investment. It is used for various purposes, one of which is to derive allowable revenue, and often prices, for the entities that are subject to regulation. In more light-handed frameworks, it is used by regulators and policy makers to determine if firms may be earning excess returns. WACC is a topic about which policymakers, service providers, services users, end consumers and regulators have expressed a variety of different views.

Form of WACC

Consistent with other Australian regulators, we use a nominal, post-tax WACC, specifically Officer's 'WACC3' definition. A 'post-tax' framework refers to the rate of return after company tax (but before personal tax). For Officer's WACC3, we estimate the tax paid by a firm (company tax) and the value of imputation credits (gamma) within the allowable regulatory cashflows as separate items. Officer's WACC3 is then calculated as follows:

$$WACC = \frac{E}{V} \times r_e + \frac{D}{V} \times r_d$$

where:

r_e = nominal post (company) tax rate of return on equity

r_d = nominal pre-tax rate of return on debt[1]

E = value of equity

D = value of debt

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[1] The rate of return on debt is characterised as 'pre-tax', as the cash flow being discounted is the before (company) tax cash flow to lenders (i.e. the interest payments made by the company to lenders).

V = value of the firm (equity + debt)

Overall WACC

In determining rates of return that apply to regulated entities, our key regulatory task is to consider if the overall rate of return is reasonable. Determining whether the WACC is reasonable first requires us to consider the overarching commercial and regulatory risks facing the regulated entity. This requires an assessment of the way in which all risk is addressed within the overall regulatory framework and the interaction with the specific market characteristics (commercial risks) the regulated entity faces.

Risk and the regulatory framework

A regulated entity will inevitably be exposed to risk when providing services. The regulatory framework effectively outlines how these risks are mitigated, allocated and/or compensated within the regulatory arrangements. Our determination of a reasonable rate of return relies on understanding a regulated entity's exposure to commercial and regulatory risks given the overall regulatory framework and the firm's market context. The diagram below highlights how the features of regulatory framework can impact on a regulated entity's risk profile. It is this risk profile that we consider when determining reasonable rates of return.

Figure 1. How the features of regulatory framework can impact on a regulated entity's risk profile
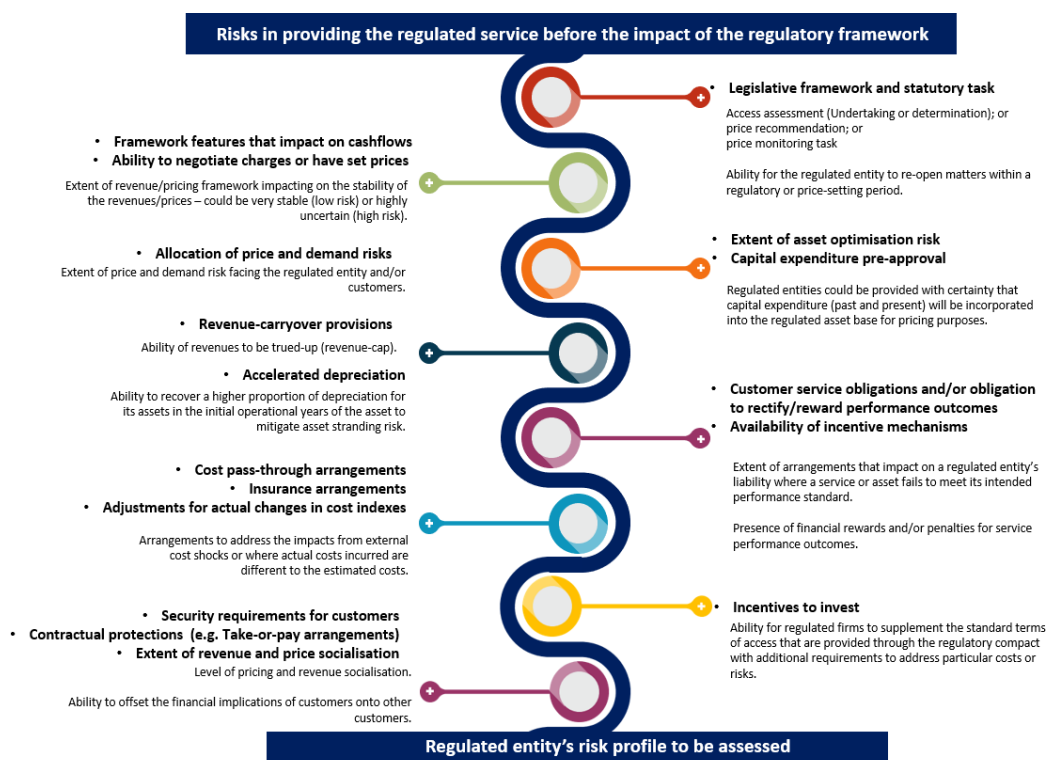
The WACC is the compensation for investment by the regulated entity that accounts for the commercial and regulatory risks within the regulatory framework having regard to the extent these risks are allocated, mitigated or otherwise compensated. A regulated entity should not be compensated to the extent risk is mitigated or allocated to another party. Moreover, a regulated entity should not be compensated for its own inefficiency or negligence.

A mechanistic, rule-based approach to calculating a rate of return, made in isolation of understanding the regulatory framework, will not necessarily provide for a reasonable rate of return. Our approach must

consider all risk in this broader context, including the risks of not providing sufficient incentives to promote investment or having prices that are too high.

Comparisons with other regulatory decisions

Our approach to determining a rate of return is informed by our consideration of the commercial and regulatory risks facing a regulated entity.

In recent decisions we have undertaken a 'top down' analysis to understand the reasonableness of the WACC proposed by a regulated entity. In doing so, we have considered the overall WACC values determined by other Australian regulators for regulated entities that are potentially exposed to similar risk.

These WACC normalisations have sought to compare WACC outcomes by controlling for time-varying parameters (i.e. by calculating the WACC values at the same point in time). In doing so, we maintained the relevant regulator's approach. We note the exercise requires some assumptions in order to replicate other regulators' methodologies, given the lack of full information available in some regulatory decisions.[2]

Assessing overall reasonableness

Ultimately, determining a reasonable WACC requires the exercise of judgement within the context of the assessment task.

It could be the case that our 'top down' analysis may lead us to determining that an overall WACC value proposed by a regulated entity is:

- reasonable without undertaking an assessment of the proposed individual parameters; or
- unreasonable such that assessment of each individual WACC parameter is required.

In the former, consideration may be given to regulatory certainty, where a proposed parameter reflects previous regulatory decisions (such as a previous beta value).

In the case where we assess individual parameters and estimate a WACC, there may be times where regulatory judgement is determined necessary to adjust that WACC value to account for risk or uncertainty (e.g. such as statistical imprecision of observed individual point estimates, or concern with market circumstances at the time). In these instances, adjustments should be reflected in the overall WACC, rather than through individual parameters.

We note that adopting upper- or lower-bound estimates for each of the individual WACC parameters is likely to give rise to an unreasonable rate of return.

Individual WACC parameters

Gearing

A firm's capital structure refers to the relative proportions of debt and equity that together finance the firm's assets. Gearing refers to the proportion of debt that makes up the total value of its assets. In recent reviews, we have selected the gearing level for a regulated firm based on the firm's risk profile, the gearing level of comparator firms and regulatory precedent.

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[2] For instance, the averaging periods that the AER uses to calculate the cost of debt for regulated entities is confidentially determined.

> ## Question 1
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> Should the relevant comparators for determining the benchmark gearing of a regulated firm be those used in our beta analysis?

Cost of debt

The cost of debt is the cost to a firm of raising funds from debtholders. It is a fundamental component of the WACC, as debt financing is a significant cost to capital-intensive businesses such as regulated infrastructure firms.

We typically calculate the cost of debt as the sum of the risk-free rate, a debt risk premium (an amount additional to the risk-free rate a firm has to pay to acquire debt funding) and an allowance for debt-raising costs.

In recent decisions we have estimated a cost of debt with a term of 10 years (i.e. a 10-year risk-free rate and debt risk premium). Calculating a 10-year debt risk premium is consistent with the efficient debt financing practices of regulated infrastructure firms with long-lived assets. Issuing debt for longer terms, such as 10 years, can help manage refinancing risk.[3]

Debt management strategy

Before estimating a regulatory cost of debt allowance, it is first necessary to choose a benchmark debt management strategy as the basis for this estimation process. In Australia, regulators typically apply either an on-the-day or trailing average debt management strategy for this purpose.

Historically, the QCA has solely relied on the on-the-day approach to estimate an appropriate cost of debt. This approach assumes that the regulated entity refinances its entire debt portfolio immediately before the commencement of the coming regulatory period.[4] An on-the-day approach to estimating the cost of debt has seen wide use by regulators in Australia.

In practice, many firms stagger their debt financing to avoid needing to refinance their entire debt portfolio over a relatively short window of time. This has in part led many Australian regulators over the last decade to move to estimating the cost of debt using a form of trailing average cost of debt.[5]

A trailing average cost of debt assumes that a firm refinances a portion of its debt (debt tranche) at staggered intervals (typically yearly), rather than refinancing all its debt at the start of a regulatory period, reducing refinancing risk. The trailing average estimates the regulatory cost of debt as an average of the total cost of debt over an historical period, with regular updates of that average, which may better reflect how an efficient firm refinances its debt in practice. In this instance, it provides a better match between the allowed regulatory cost of debt and the firm's actual cost of debt.[6]

We are open to the trailing average cost of debt as an alternative regulatory debt management strategy benchmark to the on-the-day approach. As there are a variety of ways in which it can be implemented, we

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[3] Refinancing risk is the risk that, when a business seeks to refinance its existing debt portfolio, it is unable to do so efficiently. This may be because it will incur a significant premium to refinance the debt (e.g. if there is a large quantity being refinanced) or because the bond market is either closed or thinly traded at the time.

[4] The on-the-day approach involves setting the regulatory cost of debt over a relatively short period preceding (but close to) the start of the regulatory period. The rationale for this approach is that the allowed cost of debt at the beginning of a regulatory period should reflect prevailing market conditions, providing an efficient signal for new investment.

[5] For example, the AER, ESC, ESCOSA and ICRC all have recently used a trailing average cost of debt approach.

[6] Given the trailing average approach uses a moving average, it may also result in less volatility in prices (relative to an on-the-day approach where the cost of debt can vary substantially from one regulatory period to the next).

consider it useful to engage with stakeholders to help inform our view on an appropriate implementation of the trailing average cost of debt for regulated entities.

A trailing average approach can be applied to the entire cost of debt, or to the debt risk premium only. Most Australian regulators apply it to the entire cost of debt.[7]

Question 2

Should the trailing average be applied to the entire benchmark cost of debt, or only to the debt risk premium?

Other considerations are the term of the trailing average and the number of debt tranches within it. Most Australian regulators have implemented trailing averages that align with the term of debt (e.g. 10 years) and allow for annual updates. Our recent regulatory decisions have considered that a 10-year benchmark debt term is appropriate, which is consistent with most other Australian regulators.

Question 3

What should be the term of the trailing average cost of debt, and how frequently should each debt tranche be refinanced?

Most trailing averages implemented in Australia allocate equal weights to each debt tranche. However, we note that in the AER's 2013 rate of return guideline, it considered the use of a trailing average approach that weighted each annual debt tranche by changes in the regulatory asset base over that year (based on, among other things, capital expenditure in that year).[8]

Question 4

Should each debt tranche in the trailing average cost of debt be given equal weighting, or should some alternative weighting scheme (such as weighting by capital expenditure) be implemented?

Most of our regulatory decisions and associated prices for regulated entities apply for a defined regulatory period (usually between three to five years). When implementing the trailing average approach, a consequential consideration is whether to pass through the updates for the regulatory cost of debt via annual price updates or a true-up at the beginning of the next regulatory period.

Question 5

Should the price changes for a trailing average cost of debt be passed through each year, or at the end of each regulatory period?

An important consideration for implementing a trailing average cost of debt is whether there should be a transition over time to the trailing average approach, or if there should be an immediate implementation. We note that the AER in its 2013 rate of return guideline decided that there should be a transition to a

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[7] For example, Independent Competition and Regulatory Commission, *Regulated water and sewerage services prices 2018–23*, final report, May 2018, p. 98; Australian Energy Regulator, *Rate of return instrument explanatory statement*, December 2018, pp. 276–306.

[8] Australian Energy Regulator, *Better Regulation: Explanatory statement: Rate of return guideline*, Better Regulation program, December 2013, p. 115.

trailing average, whereas other regulators such as ESCOSA and ESC have implemented a trailing average cost of debt immediately.[9]

Question 6

Should there be a transition period to a trailing average cost of debt, or should the trailing average be implemented immediately? If there is a transition, what should it look like—for example, how long should the transition be?

Question 7

Should a regulated entity commit to a trailing average approach for a minimum length of time (for example, 10 years)?

Credit rating

A credit rating is an assessment of the creditworthiness of a borrower. A higher credit rating indicates a borrower is less likely to default (not be able to repay the amount borrowed), and generally corresponds to a lower debt risk premium. Selecting a credit rating for a regulated entity can involve assessing a number of factors, such as the firm's business risk and financial risk[10], taking into account the regulatory gearing level, regulatory precedent and the credit rating of comparator firms. We consider credit metrics to test whether the firm is likely to remain financeable over the regulatory period, given the credit rating and the forecast regulatory cash flows. Most Australian regulators assume a credit rating of between BBB and BBB+.

Question 8

Should the relevant comparators for assessing the credit rating of the regulated firm be those used in our beta analysis?

Corporate bond data source and methodology

Several data sources and methods are available for estimating the cost of debt. Sources of data include third-party providers, such as the Reserve Bank of Australia (RBA), Bloomberg and Thomson Reuters. The use of third-party data is common across the Australian regulatory landscape. One or more sources of data can be combined in a variety of ways to calculate the cost of debt.

In recent reviews, we have calculated the debt risk premium (applying an on-the-day approach) for the relevant regulated firm by taking a 20-day average[11] of corporate bond yields using data from each of the

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[9] See Australian Energy Regulator, *Explanatory Statement: Rate of Return Guideline*, Better Regulation program, December 2013, p. 98; Independent Pricing and Regulatory Tribunal, *Review of our WACC method*, final report, February 2018, pp. 24, 28; Essential Services Commission, *Melbourne Water Price Review 2016*, final decision, June 2016, p. 50.

[10] Business risk relates to the firm's earnings volatility and its ability to generate sufficient revenue to cover its operational expenses. Such risk can be assessed by examining a number of factors. Financial risk relates to the firm's ability to manage its gearing and debt-related obligations, such as interest payments and can be assessed by testing credit metrics.

[11] The 20-day averaging period was selected as a period close to the commencement of the regulatory period, to reflect recent market conditions upon commencement of the regulatory period.

RBA and Bloomberg[12], subtracting the corresponding 20-day (average) risk-free rate from each using RBA data, and then taking a simple average of those two estimates.[13]

Question 9

Should we continue to use data from third-party providers to calculate the cost of debt? If so, which third parties? What approach should be used to derive the cost of debt estimate (i.e. average of multiple third-party sources)?

An averaging period is required to estimate the cost of debt allowance. Most regulators in Australia favour averaging rates over several days to smooth out possible anomalies. In recent regulatory decisions we have adopted a 20-day averaging period as close as reasonably practical to the beginning of the forthcoming regulatory period. The AER allows each regulated entity to nominate its own preferred dates and length of observation window in advance—whereas the ESC and OTTER stipulate observation terms of an entire year and 40 days, respectively.

We are also interested in considering what averaging period should be employed for the on-the-day and the trailing average approaches.

Question 10

For the on-the-day cost of debt calculation:

- What is an appropriate length averaging period?
- When should the averaging period be, relative to the commencement of the regulatory period? For example, should the averaging period occur no more than six months before the regulatory period commences?

Question 11

For the trailing average cost of debt calculation:

- What is an appropriate length averaging period?
- When should the averaging period be? Should the averaging period occur at the same time each year?

Debt raising costs

We typically provide firms with an allowance for the transaction costs associated with raising debt, as part of the cost of debt.[14] In recent decisions, we have provided an allowance in the cost of debt for regulated

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[12] For the RBA we used the BBB-rated series, extrapolated to an effective 10-year term, and for Bloomberg we used the BVAL 10-year BBB-rated series.

[13] In past reviews, the use of a term-matched risk-free rate required us to calculate a debt risk premium to estimate the cost of debt (i.e. the risk-free rate and debt risk premium had different terms so had to be calculated separately). However, we note that since adopting a 10-year risk-free rate this is no longer the case.

[14] We note that the AER includes an allowance in the regulatory cash flows for transaction costs involved in raising debt and equity, rather than in the WACC (Australian Energy Regulator, *Rate of return instrument explanatory statement*, December 2018, pp. 57–58).

entities of 10.8 basis points per annum.[15] This allowance comprised estimates of arrangement costs and other debt raising costs.[16]

Question 12

Are there other cost categories we should consider in estimating a debt raising cost allowance?

Are different debt raising costs required dependent on the debt management strategy adopted?

Question 13

Are there any other matters relating to the implementation of a trailing average cost of debt that we should consider?

Cost of equity

The cost of equity is the return required by shareholders for investing in a firm. The return to shareholders is a cost to the firm.

To estimate the cost of equity, we have historically used the Sharpe-Lintner capital asset pricing model (SL-CAPM). This model assumes that the cost of equity for a firm is dictated by the way that the firm's returns vary relative to the market portfolio (through the parameter, beta). The expected return on equity is defined as the sum of the return on a risk-free asset and the premium required to accept the risks associated with the firm, as follows:

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

Where:

r_e = return on equity

r_f = risk-free rate

β_e = equity beta

MRP = market risk premium

Gamma is another input to the cost of equity that can impact a firm's cash flows through the equity beta and the tax allowance.

While not without limitations, the SL-CAPM is widely used by regulators and market practitioners due to the way it conceptualises risk and because it is relatively straightforward to implement.

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[15] PWC calculated a value for benchmark debt raising transaction costs for domestic corporate bonds of 10.8 basis points per annum - assuming a single debt issue (see QCA, *Cost of debt estimation methodology*, final decision, August 2014, pp. 11–13).

[16] Arrangement fees are earned by investment banks to compensate for their management of the capital raising process. Other debt raising cost categories included legal fees, credit rating fees, registry costs, agent's out-of-pocket expenses, and cross-currency hedging (PWC, *A cost of debt estimation methodology for businesses regulated by the Queensland Competition Authority*, June 2013, pp. 73-86).

Beta

The asset beta is a firm-specific WACC parameter that reflects the systematic risk of the firm in the absence of financial leverage. The levered equity beta reflects not only this risk, but also the financial risk borne by equity holders from the use of debt as part of the funding for the firm.

We seek to estimate the beta value for a benchmark efficient firm that faces a similar level of risk. As the entities we regulate are not publicly listed,[17] we rely on the beta estimates of comparator firms. This requires historical returns for the firm as well as the relevant market index. The estimate is influenced by how far back in time we look, as well as the frequency of the data observations. Determining an appropriate number of observations for the calculation can involve a trade-off between precision and bias.

Question 14

Over what time horizon should we estimate beta (e.g. 2 years, 5 years, 10 years)?

Question 15

What return interval(s) should we rely upon when estimating beta (i.e. should our asset betas be estimated using daily, weekly, or monthly return data)?

Typically, we update our beta estimates for the relevant industry reference points as part of each review.[18] Over the short term, some of the variation in these estimates may be attributable to statistical noise, rather than to changes in the systematic risk profile of the firms in the industry samples. Therefore, there may be merit in maintaining the beta values of our reference points (unless there is compelling evidence for a change), which could help promote regulatory certainty. We note that IPART has taken a similar position in its recently published draft report on estimating equity beta.[19] On the other hand, we note that the Water Services Regulation Authority in England (Ofwat) considered there were strong reasons for favouring two-year daily betas to derive an unlevered beta estimate, including that it captures relatively recent data.[20,21]

Question 16

Given that some volatility in beta estimates will reflect statistical noise, should we consider maintaining the beta estimates of our industry reference points for set period of time (for example two years) unless there is compelling evidence to change those estimates?

In order to determine which comparator firms should be used to assess a reasonable beta, we typically undertake a first principles analysis to identify key determinants of the regulated entity's systematic risk

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[17] Also, Aurizon Network is only one segment of the listed company Aurizon Holdings Ltd.

[18] By reference points we refer to beta estimates used to establish points of reference for assessing relative risk—they are not determinative for our decisions on regulated entities.

[19] IPART proposed that in future price reviews certain criteria must be met before it considers a revision to an established beta value. These criteria are that the prior beta estimate is more than one standard deviation from the mean of the current sample, and there is persistent evidence over a long period (i.e. a regulatory period or longer) of changed beta (Independent Pricing and Regulatory Tribunal, *Estimating Equity Beta for the Weighted Average Cost of Capital*, draft report, March 2020, pp. 2, 7–9).

[20] Also, that it has historically been a good predictor of betas in the following 5 year period.

[21] However, in selecting a point estimate for unlevered beta it considered both 2 year and 5 year data (Ofwat, *PR19 final determinations: Allowed return on capital technical appendix*, December 2019, p. 65).

(e.g. market power and regulation, elasticity of demand for the product/service, nature of customers, and contracting arrangements).

Question 17

Are the following features appropriate for assessing the level of risk that a firm is exposed to? If so, are they equally important or are some factors more important than others for assessing the risk of a firm?

- Market power
- Nature of the customer base
- Regulation
- Contracting arrangements
- Elasticity of demand for the product/service
- Growth options
- Operating leverage

These features are then compared against the key features of typical firms in industries that may have relevance-as we want to identify industries that have similar, underlying systematic risk, to use as comparators in our analysis. In past decisions we have considered that, while similarity of a firm's physical or operational characteristics could indicate similar systematic risk, this will not necessarily be the case. This is because there may be other factors that more heavily influence the way in which a firm's returns moves with the market.

Question 18

How important are the physical and operational characteristics of the regulated entity when evaluating the relevance of comparator firms and industries?

In recent reviews we have investigated various firms in regulated energy and water, toll roads, pipelines and Class 1 railroads.[22] The asset betas for firms in these industries have been used as reference points to assist in our consideration of an appropriate asset beta for the regulated firm. For example, in our recent decision on the Queensland Rail 2020 draft access undertaking, we considered that Queensland Rail's West Moreton coal assets were likely to face greater systematic risk than the risk faced by firms in regulated energy and water, but less than that of toll roads firms; therefore, we considered the beta value for Queensland Rail would lie within the range of beta values for these industries.[23]

Question 19

In recent reviews we have considered firms operating in regulated energy and water, toll roads, pipelines and Class 1 railroads industries as beta reference points. Are there any other industries that could act as useful reference points to determine beta for the entities that we regulate?

Often the debate in our reviews has focused on the appropriateness of relying on certain industries as reference points—for instance, whether the risk of the regulated entity is more like that of a regulated energy and water business or a Class 1 railroad—to inform our estimate of an asset beta for the regulated

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[22] We calculate the asset betas for these firms using simple econometric analysis of stock price data.
[23] QCA, *Queensland Rail 2020 draft access undertaking*, final decision, February 2020, pp. 36–38.

entity. However, choosing representative firms from within one of these comparator industries and estimating their beta values to generate meaningful reference points is also an important task.

We are currently reviewing the representativeness of the firms used in past samples and how their betas are estimated and request input from stakeholders before reaching a view. We want to be confident that individual firms in an industry are good comparators (i.e. that they share a similar level of systematic risk as a typical firm in that industry). Sometimes, firms have characteristics that change their risk profile, and therefore they may not be relevant comparators—for example, a firm in that industry that also has significant operations in other industries may have greater/less risk depending on the systematic risk of that other industry. There may also be other non-risk factors that might cause potential comparator firms to be less relevant, or irrelevant, such as the size of the firm (measured by market capitalisation) and trading liquidity.

Question 20

What characteristics of a firm are likely to make it unrepresentative of a typical firm operating in that industry (e.g. having operations in other industries; having parent ownership; the regulatory framework being too dissimilar; and being in a country outside of Australia or in a less-developed country)?

Question 21

What other criteria should we consider when identifying comparator firms in our sample industries (e.g. sufficient trading volume, market capitalisation and standard errors of beta estimates)?

Market risk premium

The market risk premium (MRP) is the additional return that an equity investor requires to be compensated for the risk of investing in a portfolio of risky assets, relative to purchasing a risk-free asset.

Given the MRP is not observable we rely on various estimation techniques to estimate MRP values. In recent reviews we have relied on the results from a range of estimation methods—such as historical (Ibbotson, Siegel), forward-looking (Cornell dividend growth model) and hybrid (mixed) (Wright and survey methods)—to inform our view on an appropriate value of the MRP. We note that some regulators presently give more weight to estimates based on historical data.[24]

Question 22

Should we continue to rely on the results from each of the Ibbotson, Siegel, Wright, Cornell dividend growth model and survey methods? Should we place relatively more weight on historical methods or forward-looking approaches?

In recent decisions our method for choosing a value for the MRP has been to consider the mean, median and weighted mean of the values estimated by the five methods and choose an appropriate value at a half-

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[24] For example, the AER, ERA and ESCOSA have adopted values for the MRP in recent decisions based entirely or mostly on historical data and/or methods (Australian Energy Regulator, *Rate of return instrument explanatory statement*, December 2018, pp. 220–22; Economic Regulation Authority of Western Australia, *2018 and 2019 weighted average cost of capital for the Freight and Urban Networks, and the Pilbara Railways*, final determination, August 2019, pp. 52–53; Essential Services Commission of South Australia, *SA Water Regulatory Determination 2020 — Statement of reasons*, June 2020, p. 220).

percent interval (e.g. choose a value of 6.0%, 6.5%, 7.0%, …), that lies between the lowest and highest estimate.

> ## Question 23
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> Should we continue to assess a value for the MRP based on the median, mean and a weighted mean of the estimates produced by each method?

As part of our historical estimation methods in past decisions (i.e. the Ibbotson and Siegel methods), we have computed historical returns using an arithmetic average. In recent reviews, the AER and ERA have computed historical returns using both arithmetic and geometric averages, as they considered that there are strengths and limitations of both averaging approaches.[25] For instance, using an arithmetic average might produce an estimate that is upwardly biased, and a geometric average might produce a downwardly biased estimate.[26]

> ## Question 24
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> As part of the historical estimation methods, should we continue to compute historical returns using an arithmetic average, or should we also use a geometric average?

In addition to the averaging of returns, the return interval (as part of historical methods) for which returns are to be calculated is also an important consideration. Previously, we considered five different sampling periods[27] and concluded that primary weight should be given to the 1958–present sampling period, due to data concerns.[28]

> ## Question 25
>
> As part of our historical methods should we continue to give primary weight to the sampling period from 1958–present, or should we give more weight to a different sampling period/s?

Risk-free rate

The risk-free rate is the rate of return on an asset with zero default risk. It compensates the investor for the time value of money. Commonwealth Government bonds are commonly considered to be a reasonable proxy for the risk-free rate.

In the last decade we have estimated the risk-free rate using an interpolated term-matched bond term. However, in our most recent reviews we have reverted to using a 10-year bond term to estimate the risk-free rate, as we considered that it would better provide for an overall return that was commensurate with the commercial and regulatory risks involved for regulated entities that invest for the life of the asset (long-term).

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[25] Australian Energy Regulator, *Rate of return instrument explanatory statement*, December 2018, pp. 89–91; Economic Regulation Authority, 2018 and 2019 Weighted Average Cost of Capital – Final Determination, August 2019, pp. 39–43.

[26] Blume, M, 'Unbiased Estimators of Long-Run Expected Rates of Return', *Journal of the American Statistical Association*, vol. 69, 1974, pp. 634-638.

[27] These sampling periods included the periods from 1883–present, 1937–present, 1958–present, 1984–present, and 1988–present.

[28] QCA, *Cost of capital: market parameters*, August 2014, pp 20.

We have typically estimated the risk-free rate over a 20-day averaging period. In doing so, we have attempted to strike a balance between using a window that is short enough so that the data best captures current market conditions for the coming regulatory period, while also being long enough so that a single day of unusual market activity will not have a dominant impact. In our recent Queensland Rail 2020 DAU review, we acknowledged that Queensland Rail may wish to nominate a longer averaging period than 20 days to limit the extent to which short-term volatility influences market rates.[29] We are also aware that other Australian regulators use, or are open to using, an averaging period that is longer than 20 days.[30]

Question 26

Should we allow for the risk-free rate to be calculated over a longer averaging period than 20 days?

Gamma

As noted above, a 'post-tax' framework refers to the rate of return after company tax (but before personal tax). As such, we are required to estimate the tax paid by a firm (company tax) and the value of imputation credits (gamma) within the allowable regulatory cashflows as separate items.

We recognise that the Australian tax system allows companies to provide shareholders with credits (i.e. dividend imputation credits) to reflect company taxes paid on profits that are distributed as dividends. Some shareholders can then use the distributed imputation credits to reduce their personal tax liabilities. Therefore, usable imputation credits effectively reduce a company's cost of capital--because they reduce the proportion of the return on equity that the company provides to shareholders.

To estimate gamma we calculate the product of the:

• distribution rate—the ratio of distributed imputation credits to company tax paid; and

• utilisation rate—the rate at which distributed imputation credits are used by investors in the market.

In recent reviews we have applied a gamma value of 0.484, based on a distribution rate of 0.88 (average distribution rate of the top 20 companies on the ASX by market capitalisation) and a utilisation rate of 0.55 (equity ownership of Australian listed companies). This is similar to values applied by other Australian regulators.[31]

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[29] Queensland Competition Authority, *Queensland Rail's 2020 Draft Access Undertaking*, draft decision, April 2019, pp. 33.

[30] For instance, the AER uses an averaging period between 20 and 60 days in length (Australian Energy Regulator, *Rate of return instrument explanatory statement*, December 2018, pp. 131). The ERA uses an averaging period of 40 days for its rail WACC decisions (Economic Regulation Authority, *2018 and 2019 Weighted Average Cost of Capital*, final determination, August 2019, p. 20). ESCOSA used a 60-day averaging period in its 2020 SA Water Regulatory Determination (Essential Services Commission of South Australia, *SA Water Regulatory Determination 2020 — Statement of reasons*, June 2020, p. 209).

[31] In recent decisions, the ERA, ACCC and ESCOSA have applied a value for gamma of 0.5. In the AER's recent rate of return guideline it applied a value of 0.585.

Question 27

Should we broaden our estimate of the distribution rate to give weight to rates based on unlisted equity?

Should we estimate the utilisation rate using alternative approaches such as taxation statistics or market value studies (i.e. dividend drop-off)?