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Submitted to QCA's online submissions portal

2021 Rate of Return Review: Draft Report

24 August 2021

Dear Charles,

Aurizon Network welcomes the opportunity to respond, and contribute to, the Queensland Competition Authority's 2021 Rate of Return Review.

Please find attached Aurizon Network's response submission to the Draft Report published on 28 June 2021. The submission does not include confidential information and is suitable for publication.

If you have any questions on the attached submission, please contact Dean Gannaway by email at dean.gannaway@aurizon.com.au.

Kind regards,

A handwritten signature in black ink, appearing to read "Jon Windle", written over a light grey horizontal line.

Jon Windle
Manager Regulation

Attachment: Aurizon Network Response to 2021 Rate of Return Review: Draft Report

Response to Queensland Competition Authority 2021 Rate of Return Review: Draft Report

24 August 2021



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Executive Summary

The Queensland Competition Authority (**QCA**) published its Draft Report on its 2021 Rate of Return Review (**the Draft Report**) on 28 June 2021. The conclusions from the 2021 Rate of Return Review are intended to inform and guide stakeholders into the QCA's latest consideration into the matters relevant to the QCA's rate of return assessments, rather than represent a binding set of methodologies. Aurizon Network agrees with this intention.

Aurizon Network welcomes the QCA's pragmatism and recognition that the determination of reasonable rates of return is an imprecise process and that it will undertake overall reasonableness checks on the bottom-up estimates from the application of those methodologies. This is particularly important given the QCA's dual roles of price monitoring and price reviews of essential services under Part 3 of the *Queensland Competition Authority Act 1997 (Qld)* (**QCA Act**) and the review of reasonable terms and conditions of access under Part 5.

The findings and guidance in the QCA's Final Report should also not preclude or prevent access providers and their customers agreeing to methodologies or inputs which depart from the Final Report where these can be agreed in the collective negotiation of common terms and condition of access, including price.

It is also possible that future determinations or reviews of businesses regulated by the QCA under Part 5 will need to consider a broader range of impacts associated with Environmental, Social and Corporate Governance implications for financial markets. These potential impacts are highly uncertain and may not be foreseeable now but could impact on the cost and availability of finance and increase the transaction costs of obtaining that finance in the future. These impacts may then be relevant to matters such as asset stranding premia, gearing, credit ratings, debt risk premiums and debt raising costs.

Aurizon Network is largely supportive of the conclusions reached by the QCA but cautions against seeking to limit or restrict the information which could or would be considered in the determination of a reasonable rate of return. For example, the specification of the methodology and data for asset betas and market risk premium may result in the exclusion of information that would be relevant to evaluating the reliability of those estimates.

Our submission to the Draft Report seeks to identify information or materials Aurizon Network considers would improve the robustness of the QCA approach to estimating inputs to determining the weighted average cost of capital (**WACC**). In addition, there are two areas where Aurizon Network considers the QCA should undertake further research and analysis to support positions adopted in the Draft Report. These include:

1. **Asset Beta.** The Draft Report does not provide the relevant empirical analysis or evidence to support a conclusion that asset betas can be reliably determined from a sample of out-of-industry comparators.
2. **Trailing Average Cost of Debt.** The Draft Report does not include a detailed analysis of the suitability or applicability of the trailing average cost of debt approach to businesses regulated under Part 5.

Importantly, the Draft Report includes no modelling, analysis or proofs that the implementation of a trailing average cost of debt for a business that has implemented the prevailing on the day debt management strategy would not impose material costs on either the access provider or its customers. To assist the QCA in this matter we have commissioned a report at Attachment A which considers the implications of implementing the trailing average approach without transition.

Role and Purpose of the 2021 Rate of Return Review

As noted in our response to the QCA's Request for Comments Paper there can be efficiencies arising from regulators undertaking periodic reviews of their methodologies and principles where there is a reasonable degree of commonality of those methodologies and principles across the businesses for which the regulator has regulatory responsibilities. This is particularly relevant to those businesses which are expected to have reviews or determinations within a reasonable period of time from the completion of that review. For example, the timeframe for these periodic reviews are typically 5 years or sooner¹ which suggests the utility or currency of the findings of these reviews diminish over time. In this regard, Aurizon Network notes the findings or conclusions from the 2021 Rate of Return Review are informative but not a substitute to the proper consideration of the information, data and evidence which will emerge or be available between the period from the QCA's Final Report and the determination of the rate of return for the next Central Queensland Coal Network (CQCN) access undertaking in 2027.

These matters and the limitations of this review are acknowledged by the QCA²:

This review process is not intended to prescribe a binding methodology for rate of return assessments, but rather to provide our latest consideration of these matters to guide stakeholders. Our intention is that in future regulatory reviews that require an assessment of rates of return, all stakeholders will be given an opportunity to make submissions, which we will consider on their merits.

This acknowledgement is welcomed and is particularly relevant given:

- The Final Report is not a determination by the QCA and as such parties have no rights of appeal in respect to any conclusions made in the Final Report;
- There is discretion afforded to the Queensland Treasurer to materially depart from the QCA's methodologies and principles for determining the Rate of Return through explicit directions given in referral notices³;
- The Final Report is not specific to a particular industry and there are material differences in the matters relevant to the determination of a rate of return for an essential service and the rate of return for an export infrastructure provider regulated under Part 5, that cannot be 'fixed' within a single assessment framework; and
- The most efficient rate of return is that which at least compensates the access provider by providing for a reasonable rate of return on its investment commensurate with the preferred allocation of risk negotiated between the access provider and access seekers/holders.

In respect of the primacy of commercial negotiation for access the QCA recognises this position in the Draft Report⁴:

We consider that there are benefits to negotiated outcomes, and where such outcomes are legally permitted and do not create anti-competitive effects, they should not be interfered with. Moreover, if a regulated entity and its customers support a proposed rate of return, the parties

¹ For example under section 18U(2) of the National Electricity (South Australia) Act 1996 the Australian Energy Regulator must publish a replacement Rate of Return instrument four years after the current instrument was published.

² QCA (2021) Rate of Return Review: Draft Report, June, p. (iv).

³ See the 2017 and 2021 SEQ Bulkwater Prices Ministerial Referral Notices which required the QCA to use the QTC estimates of debt for the cost of debt and the use of Inflation Swaps for forecasting inflation respectively. Both approaches differ from the QCA's prevailing methodologies at the time.

⁴ QCA (2021) Rate of Return Review: Draft Report, June, p. 8.

have made their own assessment of the benefits and costs of the agreement underpinning it, including the commercial and regulatory risks.

Notwithstanding, the limitations of the Final Report and its application to the determination of the rate of return for the next CQCN access undertaking in 2027, the methodologies and principles in the Final Report may inform stakeholder views and positions in respect of how the negotiation of those future arrangements between Aurizon Network and its customers proceed. It is typical within negotiate-arbitrate models, whether collective or bilateral, for stakeholders to frame their positions for negotiations with the expected outcomes from arbitration as noted by the Productivity Commission⁵:

Rather than trying to reach a mutually beneficial outcome, airport operators and airport users would negotiate 'in the shadow' of arbitration. They would have incentives to try to second guess the arbitrator's determination. The outcomes of negotiations would be determined by assumptions about the arbitrator's potential decisions rather than the negotiating parties' commercial incentives.

While not immediately relevant to the terms and conditions of providing access to the declared service within the CQCN, the methodologies and 'guidance' in the Final Report has the potential to adversely influence parties' incentives to the collective negotiation of common terms and conditions of access. Therefore, this submission provides additional information Aurizon Network suggests as relevant to the QCA's consideration of a wider '*range of empirical evidence, academic papers and market data*'⁶.

QCA's Approach to the Rate of Return

Aurizon Network agrees with the QCA's approach to determining a WACC representative of a benchmark firm as this remains consistent with the objectives of incentive-based regulation.

The QCA also reasonably concludes that when determining a WACC, sole reliance should not be placed on the mechanistic application of the bottom-up approach to determine efficient prices and revenues and the proposed or required rate of return should be subject to reasonableness checks and benchmarks. Aurizon Network supports this view and to the extent the regulator considers that access on reasonable terms is consistent with the '*prices and other terms and conditions that, so far as practical, reflect the outcomes of a workably competitive market*'⁷, then the reasonableness checks should include sources of information that are compatible with that objective.

Regulatory Discretion and Reasonableness Checks

A necessary consequence of applying or approving a WACC which differs from the bottom-up approach to determine commercially reasonable terms and condition of access, or terms which are consistent with the value of the service to customers, is that a regulator will need to exercise discretion. How that discretion is exercised necessarily requires judgements to be made on the information relevant to how that discretion is exercised as noted in the Draft Report⁸:

⁵ Productivity Commission (2020) Economic Regulation of Airports, Report no. 92, Canberra, p. 303

⁶ QCA (2021) Rate of Return Review: Draft Report, June, p. 15

⁷ Section 546(1) of the National Gas Rules

⁸ QCA (2021) Rate of Return Review: Draft Report, June, p. 17

'In circumstances where we apply a discretionary adjustment, we would provide our reasoning for the adjustment and for its size. We note that if owners or operators of declared services require certainty, they may apply for a binding ruling under part 5 of the QCA Act... We also consider that it is the total return that is important, and this is the intended purpose of our top-down approach.'

The Draft Report notes that one source of information relevant to evaluating the reasonableness of the WACC is to make comparisons with the normalised determinations of other regulators. Aurizon Network agrees that these comparisons should 'serve as a guide only' for access to export infrastructure as essential monopoly services are not an appropriate representation of investor preferences and risk/return expectations for coal rail networks.

In this regard, Aurizon Network agrees with the QCA statement that its statutory requirements under Part 5 are not to provide revenues which provide no net present value on invested capital⁹:

We do not consider that the NPV=0 principle is determinative of allowable revenues. First, it seems to run counter to the proper construction of the benchmark efficient firm operating in an effectively competitive market, as discussed in section 5.4.1. Moreover, if it is relevant at all, its only utility is to determine whether revenues recover efficient costs. In relation to access matters under part 5 of the QCA Act, we are required by s.168A(a) of the QCA Act to ensure expected revenues are at least enough to meet efficient costs but also to have regard to a range of other factors set out in s. 120, the proper consideration of which may, in any particular case, lead to a situation of NPV>0.

Therefore, for assets regulated under Part 5, the reasonableness checks should be inclusive of investor expectations and returns on comparable assets, the competitiveness of the return in attracting capital and the realised or negotiated outcomes for comparable services. Within regulatory decisions, the sources for reasonableness checks and therefore the regulators discretion, should be as transparent as possible to both the access provider and its customers.

Environmental, Social and Corporate Governance Impacts

A further key distinction between essential services and access to export infrastructure are the changing financial market conditions in respect of Environmental, Social and Corporate Governance (ESG) impacts on the availability and competitiveness of financing costs as institutions review their portfolios. In this regard Aurizon Network also welcomes the QCA's recognition of the potential ESG impacts on the required rates of return for ESG exposed sectors¹⁰:

In response to ARTC's comments about the societal risks related to coal assets, we consider that ESG-related risks are potentially relevant risks that should be considered. To the extent these are non-systematic in nature, there may be more appropriate means to deal with them, such as through the benchmark credit rating of the business and/or its regulatory depreciation profile.

The impacts of the changing dynamics in financial markets are outlined in the Queensland Resources Council's submission to the Joint Committee on The Prudential Regulation of Australia's Export Industries which reported the result of a survey of its members which indicate¹¹:

⁹ Ibid, p.34

¹⁰ Ibid, p. 60

¹¹ Queensland Resources Council (2021) Inquiry into the prudential regulation of investment in Australia's export industries. Submission to the Joint Standing Committee on Trade and Investment Growth, April, p. 11

- 75% of respondents said that accessing banking or lending services has become much more difficult in the past two years;
- When asked to quantify the change in their banking costs over the last two years, including their time and efforts invested in chasing finance, companies typically estimated an increase of between 50% and 85%; and
- Over a third (44%) of the companies surveyed said that if these banking costs stayed at these levels for the next five years, then they would be unlikely to continue operating.

These views are consistent with comments to the Joint Committee by the Department of Industry, Science, Energy and Resources that¹²:

“As part of normal commercial funding arrangements, or to satisfy contractual obligations with other parties, businesses will usually require access to relevant and appropriate levels of insurance. Any inability for a company to access finance or insurance on competitive terms could have significant impacts on its business outcomes, and we know that globally there is a growing trend where large financial companies are reviewing their support for fossil fuel projects and businesses. Credit Suisse, Deutsche Bank, ABN Amro, Barclays, HSBC, Goldman Sachs, BlackRock and JPMorgan Chase, to name a few, have all placed restrictions on their investment and support for coal. Locally, the four major banks have all announced plans to exit or restrict financing to customers involved in coal-fired power or thermal coal operations. ANZ and CBA have committed to exiting direct financing of coal fired power plants and thermal coal by 2030. Westpac announced that, by 2030, it will stop lending to companies that derive more than 25 percent of their revenue from thermal coal, while NAB is committed to zero financing of thermal coal by 2035. Investment bank Macquarie Group will stop financing coal projects by 2024.

Without support from domestic institutions, businesses will increasingly have to secure investment from overseas providers, from private equity, from end-user businesses or from governments’

This suggests ESG may impact the transaction costs of procuring finance, the application of additional risk premia to benchmark credit ratings and reduction in gearing levels. These factors will likely become increasingly relevant to some of the businesses regulated by the QCA and therefore any assessment of the WACC for a benchmark stand-alone coal rail network.

While adjustments to the depreciation profile are an appropriate response to managing these risks a body of regulatory precedent is being developed to quantify the value of asset stranding risk premia as noted in the attached report from CEG. Aurizon Network is continuing to monitor these regulatory developments.

QCA Approach to Cost of Equity

Aurizon Network supports the Sharpe Lintner Capital Asset Pricing Model (or the SL-CAPM) as a forward-looking model and as such the inputs used in the model should also be forward looking. In response to the concerns raised by ARTC and Seqwater that the QCA’s current approach involves the pairing of internally inconsistent parameters by using the spot risk free rate and an historical market risk premium the QCA states:

¹² Trotman, P. (2021) Transcript, Public Hearing: Inquiry into the prudential regulation of investment in Australia’s export industries, p. 30.

As the risk-free rate is observable, our best estimate for the forthcoming regulatory period has involved using current Australian Government bond yields. In contrast, as the MRP for the coming regulatory period is unobservable, our best estimate may have regard to both historical and forward-looking information. Historical information may be relevant to determining a forward-looking MRP if investors use historical returns data to shape their expectations of future return.

While it is reasonable to assume expectations are informed by past events the weighting given to historical information is not a static variable. In this regard it is unclear from the Draft Report how the QCA intends to determine how much weight should be given to historical measures relative to forward looking estimates or whether this will be considered in terms of the overall reasonableness of the rate of return.

Risk Free Rate

The Draft Report proposes to determine the risk-free rate by:

- using 10-year Australian Government nominal bond yields; and
- averaging the yields over a period nominated by the regulated entity that is between 20 and 60 business days in length, ending as close as reasonably possible to the commencement of the coming regulatory period.

Aurizon Network is strongly supportive of the QCA's proposed position on the risk-free rate and consistent with prior positions submitted to the QCA, this approach is consistent with standard finance practices and the requirements for investors who invest in long-life assets.

Aurizon Network also notes the QCA has proposed to use a five-year term to estimate forward looking expectations of inflation and apply a term for inflation which is matched to the term of the RAB-Rollforward. This ensures consistency between the forecast inflation rate and the actual inflation rate within the regulatory model. While not explicitly addressed in the draft report in estimating forecast inflation, Aurizon Network considers it is not necessary in a post-tax nominal framework to ensure alignment of the term of the risk-free rate for the cost of equity with the term of inflation used in the RAB roll-forward.

Levering Formula

Aurizon Network supports the QCA's draft position to use the Brealey-Myers levering formula when levering and delivering betas.

Asset Beta

The Draft Report proposes to continue to rely on the selection of out-of-industry comparators and exercising subjective judgement to evaluate the relativity of the firm's beta in reliance of a narrow set of 'first-principles'.

The QCA also acknowledges it is applying regulatory discretion to obtain a single point estimate based on these first-principles¹³:

¹³ QCA (2021) Rate of Return Review: Draft Report, June, p. 58

Finally, an assessment with respect to these factors is necessarily a qualitative exercise, and as such, it serves only as a guide for identifying and considering beta comparators.

Aurizon Network's submission to the QCA's request for comments paper on the 2021 Rate of Review expressed strong reservations as to the robustness of this approach and requested the QCA investigate:

- the empirical support which validates the statistical reliability of out-of-industry comparators;
- explicit examples of where regulators regulatory employ out-of-industry comparators; and
- empirical evidence which supports the reliance of the first principles as a reliable basis for the selection of out-of-industry comparators.

These points remain largely unaddressed within the Draft Report. Furthermore, the AER has also recently considered whether it should have regard to out-of-industry comparators to address the declining availability of Australian pure-play energy utilities and concluded¹⁴:

In our view, the inclusion of additional firms can bias estimates, if they do not carry a similar degree of risk or cannot be appropriately adjusted to be comparable to an efficient service provider supplying Australian regulated energy services. For instance, the addition of the toll firms listed in Australia and Chorus, as suggested by the Economic Insights reports, would not be consistent with the 'pure play' benchmark defined by the AER.

Aurizon Network will, as it has previously, undertake an extensive review of the relevant information and prospective comparators, when developing a proposed equity beta for its next regulatory reset.

This false precision in out-of-industry comparators is evident between the qualitative judgement of the relativity of systematic risk between regulated out of industry samples and the precision being sought from those out-of-sample betas by using weekly and not monthly betas. Given the inherent subjectivity of this exercise then it would seem reasonable to consider both 5 and 10-year periods and weekly and monthly frequencies. To the extent that there has been an underlying change in systematic risk of an industry or firm over time then would also be apparent in a rolling 5-year beta within the 10-year window.

Therefore, relevant information needs to be considered from a wider range of sampling windows, observation frequency and statistical methods (both OLS and LAD) that will not be obtained if the assessment is restricted to a 10-year sampling period and weekly observations. This is particularly relevant to ESG exposed sectors where the business risks will be changing over time.

Market Risk Premium

The Draft Report proposes to determine the market risk premium by:

- applying the Ibbotson method by using the arithmetic average for a sample period commencing in 1958; and
- consider dividend growth models for qualitative purposes in assessing the forward-looking cost of equity.

¹⁴ AER (2021) Rate of Return Equity Omnibus: Draft Working Paper, July, p. 6-41

The primary reliance on the Ibbotson method is dependent on the QCA's view that¹⁵:

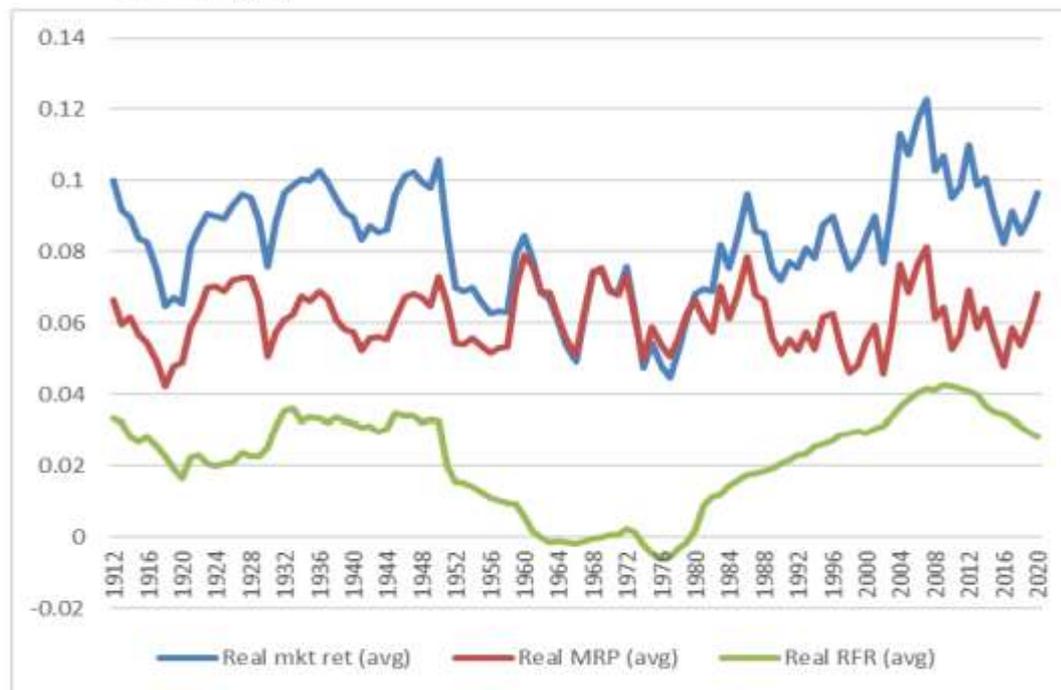
We consider that the Ibbotson method is a relevant method for determining the MRP, as investors' expectations of a forward-looking MRP are likely to incorporate consideration of past excess historical returns.

Expectations will generally be informed by all available information, inclusive of historical information and as noted above it is unclear how the QCA will determine when and how it will incorporate forward looking measures in its assessment. Aurizon Network recognises the difficulties in terms of determining weightings for different MRP estimates given these weightings will not be static as forward-looking expectations are likely to be a time varying parameter and dependent of prevailing economic conditions.

The QCA proposes not to use the Wright method based on its own analysis which replicated the work of Wright on Australian data as reproduced below. The QCA concludes from this analysis that the MRP is relatively stable over time, relative to the total market return.

Figure 1. QCA Assessment of the Wright Method to Australian Market Data

Figure 5 Time series of real market returns, real MRP and real RFR in Australia (rolling 30-year averages)



Source: QCA analysis

While Aurizon Network does not consider this analysis to be incorrect it is not overly useful in terms of the QCA's task of matching a forward-looking risk-free rate with the forward expectations of the market risk premium to determine a forward-looking expectation of the cost of equity.

In particular, the analysis does not lend itself to addressing the question of whether the forward-looking risk-free rate and the forward expectations for the market risk premium are inversely related unless

¹⁵ QCA (2021) Rate of Return Review: Draft Report, June, p. 49

forward looking estimates are strictly bounded by historical averages. The underlying assumptions are also inconsistent with the QCA approach to estimating WACC in that:

- it applies real values but the regulatory inputs are expressed in nominal terms;
- is backward looking and does not represent expectations; and
- is a 30-year moving average and therefore 'masks' any inverse relationship that might exist between the 10 year risk free rate and the expectations for the average 10 year MRP applicable to a five year regulatory period.

Consistent with the QCA views that the regulatory gearing assumption is constant rather than constant dollar debt the reliance on the 30-year moving average would also require a constant dollar debt assumption to assume that any inverse relationship between the MRP and risk-free rate would be negated over the life of asset. However, this assumption would not hold with any constant gearing assumption.

The QCA's analysis can be contrasted with the work undertaken by CEPA who do find a negative inverse relationship between the nominal bond yield and forward expectations of the nominal MRP. This analysis is reproduced in Figure 2. The authors acknowledge the limitations of the work in terms of its reliability in determining a point estimate for the MRP due to the presence of negative MRP values but note that¹⁶:

As part of these analyses, we are not claiming that the DGM and earnings yield model produce accurate measures of the MRP, but merely that they can be used to provide a consistent estimate of the directional changes in MRP. We would consider it suggestive of a potential relationship if several such specifications of forward-looking measures of the MRP provided the same directional relationship when compared with the RfR.

Figure 2. CEPA Assessment of Forward Looking MRP Estimates

Figure 5.1: Nominal bond yield compared to forward looking MRP estimates based on outturn data



Source: CEPA analysis of data sourced from RBA and Thomson Reuters Eikon

Aurizon Network notes that CEPA suggest that to the extent this inverse correlation is not perfect then a hybrid approach which places weight on both a fixed MRP assumption and a fixed total return assumption:

¹⁶ CEPA (2021) Relationship between RFR and MRP: Final Report, A report prepared for the Australian Energy Regulator, p. 39

This approach would place weight on both of the above approaches. It relies on an assumption that there is a negative correlation between the RfR and the MRP but this correlation is not perfect, so that a fall (/rise) in the risk free rate would lead to a rise (/fall) in the MRP, but the change in the MRP would be smaller than that of the risk free rate. Analysis of historical data or alternative approaches could be used to calibrate the model.

Such an approach would be consistent with the QCA's position in the draft report that it would have regard to both the historical average MRP under the Ibbotson method and forward-looking estimates from Dividend Growth Models.

In circumstances where market conditions are not consistent with historical averages, such as historically low risk-free rates then the Dividend Growth Model and Wright method should continue to be applied as cross-checks to assess the overall reasonableness of the return on equity.

Gamma

The Draft Report proposes to apply a value of gamma of 0.484, which is the product of:

- a value of 0.88 for the distribution rate based on the average distribution rate of relevant top 50 companies on the ASX by market capitalisation; and
- a utilisation rate of 0.55 based on the equity ownership of Australian listed companies.

The QCA also notes that it will periodically update this based on current statistical evidence.

Aurizon Network continues to support the use of implied market values as it is more consistent with the true value of imputation credits within the Officer WACC 3 model but recognises the current limitations in dividend drop off-studies. Therefore, Aurizon Network agrees the QCA should continuously review the available evidence. For the Final Report, the QCA should evaluate recent evidence presented to the AER by the ATO in respect of using 'net franking credits' to take into account the imputation credits that are recycled within companies. In response to this information the AER has noted¹⁷:

Our initial assessment is that the utilisation rate should take into account the imputation credits that are recycled within companies. When estimating the utilisation rate we need to determine what proportion of investors can use imputation credit (resident investors) vs investors that cannot use imputation credits (non-resident investors). Effectively assuming investors in a company can use 100 per cent of the imputation credits it receives may therefore result in an upward biased utilisation rate estimate.

QCA Approach to Cost of Debt

In determining the appropriate cost of debt, the Draft Report proposes to:

- use a benchmark trailing average debt management strategy;
- apply an unweighted (simple) 10-year trailing average to the entire cost of debt, with annual and equal debt tranche refinancing;

¹⁷ AER (2021) Rate of Return Overall Rate of Return: Draft Working Paper, July, p. 44

- implement the trailing average approach without transition other than in exceptional circumstances;
- determine debt credit rating have regard to benchmarks and comparators based on the firm's financial risk and business risk;
- source data only from the Reserve Bank of Australia with a 10 year term to maturity; and
- apply debt transaction costs of 9.9 basis points.

Aurizon Network does not support the analysis, conclusions and proposed positions in the Draft Report, particularly in respect of the absence of transitional arrangements. A key justification for not adopting a transitional arrangement is the QCA's view that this would be consistent with the forward-looking regulatory approach. It is difficult to reconcile how the application of historical cost of debt for the last 10 years in year 1 of a new regulatory period for a firm which has efficiently financed to on the day approach could be forward looking. The view is also contradicted by the AER who state¹⁸:

The trailing average return on debt does not reflect the forward-looking opportunity costs at any given point in time. This is because it is not forward looking. Currently, most (if not all) trailing average debt allowances are above forward-looking efficient debt costs because interest rates have decreased over the past few years. However, under our current approach one tenth of the debt allowance is set on a forward-looking basis in any particular year. That is, with stable RAB and capital expenditure just high enough to offset depreciation, new investment receives the allowance equal to the efficient debt cost.

The implementation of the trailing average cost of debt without transition is strictly backward looking. Aurizon Network has engaged CEG to advise on the implications of the QCA's Draft Report on the cost of debt. A copy of that report is provided at Attachment A.

The CEG report describes the hybrid trailing average model as currently applied the Economic Regulatory Authority of Western Australia (**ERA**), including gas pipelines, and by the New Zealand Commerce Commission (**NZCC**). Aurizon Network also recognises there are alternate and simplified approaches to implementing a trailing average debt risk premium model such as a ten-year historical average debt risk premium, plus a prevailing risk free rate that may be more acceptable to Aurizon Network and its customers. Alternatively, Aurizon Network and its customers may prefer to retain the on-the-day approach to ensure revenues and prices better reflect current economic conditions at the time of the reset. Therefore, while Aurizon Network does not endorse the hybrid trailing average model described by CEG as the preferred approach it supports the conclusion that that a trailing average DRP is preferable to a trailing average total cost of debt in circumstances where the quantum of nominal debt in the RAB is not constant over time.

Benchmark Firm

Aurizon Network supports the continuation of determining the cost of debt on the basis of the efficient benchmark firm rather than the firm's actual cost of debt as this remains consistent with incentive-based regulation.

¹⁸ AER (2021) Rate of Return Debt Omnibus: Draft Working Paper, July, p. 3-19

Unweighted Trailing Average Cost of Debt

Applying a simple unweighted trailing average cost of debt will only satisfy the NPV = 0 assumption where the depreciation rate and capex growth rate are sufficiently uniform over time and that the nominal value of debt in the RAB is also relatively constant over time.

This condition is unlikely to hold for businesses regulated by the QCA under Part 5 of the QCA Act and businesses may be over or undercompensated with implications for the efficient investment in the declared service.

There are a number of reasons why the nominal value of debt for business regulated by the QCA will not have a constant value of debt over time, including:

- the RAB is subject to accelerated depreciation;
- the economic life assumptions could be subject to periodic review due to changes in the expected economic life of mines using the declared services; or
- the availability and cost of finance for a benchmark stand-alone regulated firm may require swapping debt for private equity and therefore a reduction in gearing.

In addition, unlike essential services such as poles and wires or water business which have a large diverse customer base and stable or predictable demand growth with foreseeable project needs, growth projects for export infrastructure will not be committed projects until 2-4 years prior to commencement of construction. This raises two key material issues with an unweighted trailing average approach:

- the historical average cost of debt may be lower than the prevailing cost of debt meaning the incremental revenue is below the incremental financing costs as provision has not been made for the incremental capex over the last decade; and
- each incremental growth project would be required to maintain a separate debt RAB with a cost of debt determined on a different cost of debt to the existing RAB.

This problem is also noted by the AER who state¹⁹:

For a new capex program, using a simple trailing average implies that the capex program can be financed with historical debt. However, new investment can only be financed with forward looking debt. If the prevailing return on debt is lower (higher) than the historical 10 year average return on debt, this new capex program will result in a positive (negative) NPV outcome if the return on debt is estimated using the simple trailing average.

However, the suitability of the trailing average approach to the large and non-uniform capital expenditure is not considered by the Draft Report. There is a single reference to the consideration of capital expenditure which can only be valid for constant and uniform replacement capex²⁰:

Advantages of the weighted trailing average approach are that it minimises the potential mismatch between the regulatory cost of debt allowance and efficiently incurred debt costs; therefore, it provides efficient investment signals, as borrowings for new capital expenditure are compensated at the prevailing rate.

¹⁹ Ibid. p. 3-23

²⁰ QCA (2021) Rate of Return Review: Draft Report, June, p. 39

Aurizon Network recommends the QCA further investigate the implications of applying an unweighted trailing average to businesses regulated under Part 5 of the QCA Act.

Trailing Average Method

The Draft Report proposes to apply the trailing average to the total cost of debt rather than the hybrid approach to apply the trailing average to the debt risk premium. The QCA notes this is broadly consistent with the approaches adopted by other regulators, except for the ERA. However, the QCA does not discuss the nature of the businesses regulated by those regulators and the predominant ownership arrangements. In doing so, the QCA does not effectively evaluate the implications of the trailing average to businesses regulated under Part 5 of the QCA Act.

Importantly, the Draft Report does not explore the basis of regulators such as ERA and the NZCC from implementing the trailing average DRP particularly in respect of the issues discussed above. In this regard CEG observe that²¹:

- Both the WA ERA and the NZCC cite the superior investment incentive properties of the hybrid approach as a reason to prefer it to the trailing average cost of debt; and
- The application of the trailing average DRP can be effectively implemented without complex weighted transitional arrangements.

Aurizon Network also notes that the hybrid trailing average DRP is supported by the DBCT user group²².

Trailing Average Implementation

Aurizon Network does not support the QCA's conclusion that transitional arrangements are not required to implement the trailing average cost of debt. In reaching this conclusion, the QCA cites the absence of transitional arrangements by other regulators. However, as noted above the businesses regulated by some of these other regulators are likely to be state owned monopolies with central treasury agencies which manage debt based on a trailing average within the total portfolio.

In this regard we note the following comments by Houston Kemp²³:

The absence of any need for a transition reflects that, going forward, each of the methodologies contemplated by the QCA will be equivalent in present value terms over an extended horizon. Similarly, the majority of regulatory authorities in Australasia adopted a trailing average without any form of transition.

- *in 2013 IPART incorporated a trailing average yield in its approach, without any transition, and then in 2018 IPART increased its emphasis on trailing averages, again with no transition;*
- *in 2015 the Economic Regulation Authority of Western Australia (ERA) adopted a trailing average DRP, with no transition;*

²¹ CEG (2021) Efficient regulatory benchmarks, and transitions, for the cost of debt. Report prepared for Aurizon Network, August, pp. 34-35

²² Castalia (2021) QCA Rate of Return Review: A report prepared on behalf of Dalrymple Bay Coal Terminal User Group, pp. 17-20

²³ Houston Kemp (2021) QCA's Rate of Return Review: A report prepared for Dalrymple Bay Infrastructure, January, p.16

- *in 2016 the Essential Services Commission of South Australia (ESCOSA) adopted a trailing average yield, with no transition; and*
- *in 2016 the Commerce Commission in New Zealand adopted a trailing average DRP, with no transition.*

There are shortcomings in this commentary. Firstly, the equivalence of the approaches in NPV over an extended period does not address the prospect of under or over-compensation associated with a change from one approach to another. Secondly, the businesses to which IPART and ESCOSA apply the trailing average approach are water businesses who effectively applied a trailing average debt management strategy under the prevailing on the day approach²⁴. Finally, the absence of any transitional arrangements by ERA and the NZCC is consistent with transitional arrangements being unnecessary for a trailing average DRP as discussed above.

Similarly, Aurizon Network does not support the view by Houston Kemp that²⁵:

- The AER only applied transitional arrangements because the National Electricity Rules required the regulator to have regard *‘to the impact on a benchmark business of changing the approach to estimating the cost of debt’*; and
- *‘There are no equivalent provisions in the QCA Act and, even if there were, it is unlikely they would apply similarly in current market conditions, or to services provided to multi-national corporate customers involved in the provision of intermediate goods for overseas markets’*

This assessment is not correct. The need to have regard to the impact on a benchmark business from changing the approach to estimating the cost of debt is implicit in the requirement:

- for the QCA to have regard to the legitimate business interests of the access provider; and
- that prices should generate expected revenue for the service that is at least enough to meet the efficient costs of providing access to the service and include a return on investment commensurate with the regulatory and commercial risks involved.

The QCA notes it does not support implementing transition measures to address historical impacts under the on-the-day approach in previous years. However, it has not provided any supporting modelling or analysis of those impacts. There is no evidence provided which demonstrates how a firm would transition from a prevailing on the day approach to a trailing average approach without transition, and not be exposed to the prospect of a material windfall gain or loss.

As noted by CEG²⁶:

- *‘A regulated business that has designed their debt and interest rate swap portfolio to efficiently match the on-the-day regulatory allowance in one regulatory period will be unable to immediately match a trailing average regulatory allowance in the next regulatory period. This is true even if the regulated business has been given advanced warning of the proposed change in the regulatory regime’*; and

²⁴ Queensland Water businesses have also requested implementation of the trailing average without transition as they have applied a trailing average approach, through QTC, under the price monitoring regimes.

²⁵ Houston Kemp (2021) QCA's Rate of Return Review: A report prepared for Dalrymple Bay Infrastructure, January, p.17

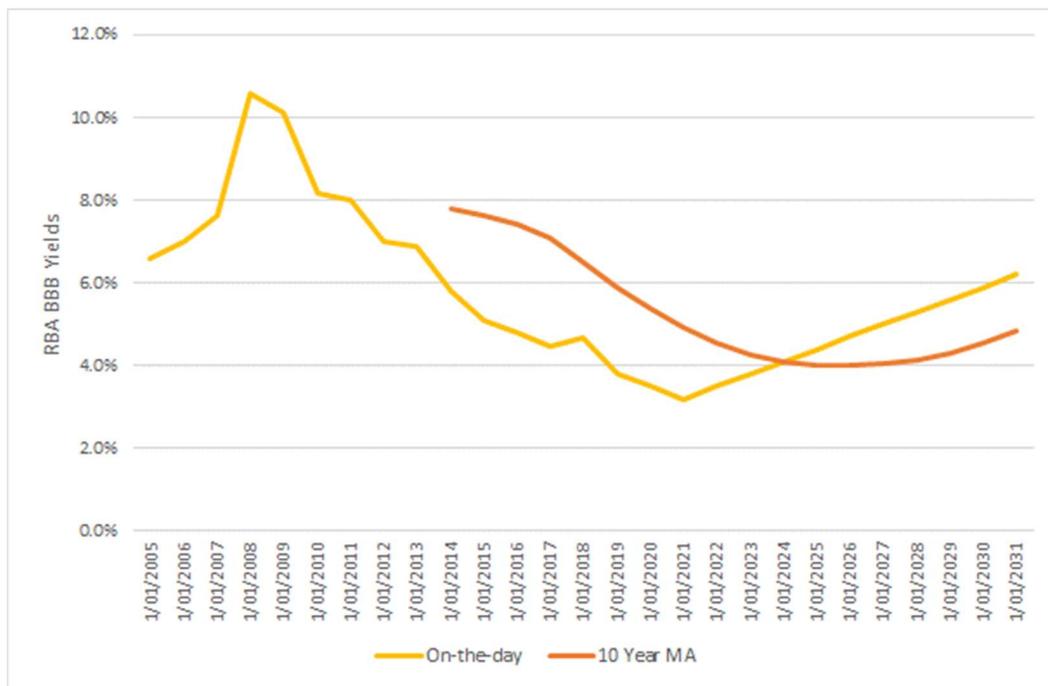
²⁶ CEG (2021) Efficient regulatory benchmarks, and transitions, for the cost of debt. Report prepared for Aurizon Network, August, p. 22.

- Even if Aurizon Network could pre-empt a move to trailing average, ‘so long as Aurizon is regulated under the on-the-day regime prior to 2028 it will need to adopt the hybrid strategy to minimise regulatory mismatch risk in the earlier regulatory periods. If Aurizon began transitioning to a trailing average prior to 2028 it would simply be incurring regulatory mismatch risk earlier (not avoiding it)’.

The analysis undertaken by CEG clearly shows that a business which is implementing the efficient prevailing cost of debt methodology could be materially impacted by the implementation of a trailing average cost of debt without transition due to regulatory mismatch of the benchmark debt management strategy under the two approaches.

These impacts can also be illustrated simply through sensitivity analysis. The graph in Figure 3 shows the prevailing yields on 10 year BBB non-financial corporate bonds produced by the RBA in June of each year up to 30 June 2021. In this example, yields are assumed to then increase annually by 30 basis points. Therefore, at the time of a WACC review in 2027 the prevailing rates would be 5.00% and the 10 year trailing average would be 4.07%. This is a difference of 93 basis points with a revenue impact approximately \$25 million per annum on a RAB value of \$5.0 billion with a gearing of 55%.

Figure 3. Yield on BBB Non-Financial Corporate Bonds and 10 Year Moving Average



Source: Aurizon Network analysis, RBA F3: Aggregate Measures of Australian Corporate Bond Spreads and Yields.

In summary, Aurizon Network does not support the introduction of a trailing average cost of debt approach without transition for businesses regulated under Part 5 that have applied a prevailing on-the-day cost of debt management strategy.

Cost of Debt Data Source

The Draft Report proposes to solely reference RBA data series for estimating the cost of debt in the future.

Aurizon Network does not support this position and recommends the QCA accept the QTC position that the QCA gives equal weight to the corporate yield estimates from the RBA and Bloomberg to be reasonable.

As noted by CEG, the difficulties on relying on a single source such the RBA data series includes²⁷:

- it is good regulatory practice to consider information from multiple data sources;
- the RBA data is less reliable as source of market conditions in any given debt averaging period because it is only estimated on one day every month;
- the RBA method is a weighted average of individual bond spread to swaps where those bonds closest to the target tenor are given more weight;
- there can be divergences between the RBA and other data providers; and
- the QCA can overcome information asymmetries with residential consumers by publishing third party data and large customer can obtain the data directly so there no obvious cost efficiencies from using RBA as the sole reference.

Credit Rating

Aurizon Network supports the QCA approach to have regard to the business risk and operating environments for benchmarking against firms with similar characteristics. Notwithstanding, as noted in the discussion on ESG earlier in this paper, the credit rating may not be a reliable basis for determining the cost of debt for firms in ESG exposed sectors if there are additional risk premiums being included in financing costs. In other words, the cash flows and liquidity may support a particular credit rating but the firm may not be able to obtain finance at the benchmark cost for that rating.

In this regard, Aurizon Network welcomes the QCA's statements that²⁸:

In the future, we may also consider risks that entities face, for example, environmental, social and corporate governance considerations— which are becoming more relevant for those industries impacted by climate change policy.

Debt Raising Costs

The Draft Report proposes to allow debt raising costs of 9.9 basis points within the cost of debt for the trailing average approach.

Aurizon Network notes that the basis for this decision is with reference to a report in 2013 and therefore may not be representative of current or future debt raising costs. The QCA notes that its 'proposed estimate of debt-raising costs, being based on research undertaken in 2013, may require updating'.

It is unclear why the Draft Report has included a specific value that is known to require updating. In addition, firms in ESG exposed sectors are likely to be subject to greater transaction costs associated with raising debt than considered or allowed for in prior research.

²⁷ CEG (2021) Efficient regulatory benchmarks, and transitions, for the cost of debt. Report prepared for Aurizon Network, August, pp. 50-51.

²⁸ QCA (2021) Rate of Return Review: Draft Report, June, p. 33

Appendix A: CEG Report on Cost of Debt



COMPETITION
ECONOMISTS
GROUP

Efficient regulatory benchmarks, and transitions, for the cost of debt

Dr. Tom Hird

August 2021

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Executive summary

1. The questions I have been asked and the summary of my answer to each is provided below. In answering this question, I distinguish between the risk free “base rate” rate of interest and the “credit risk” component (debt risk premium or DRP). The risk-free base rate is the component that can be manipulated by the business using interest rate swaps (and/or issuing floating base rate bonds). The DRP is always fixed at the time a debt is issued.
- A. What defines an efficient debt funding strategy for a regulated monopoly with high levels of sunk investment?
2. An efficient debt funding strategy for a regulated monopoly with high levels of sunk investments is one that simultaneously manages refinance risk (the risk that lenders will not be willing to provide refinance for substantial amounts of debt falling due) and the risk of mismatch between the businesses’ debt costs and the debt allowance as set under the regulatory regime.
 3. Managing these risks are critical to managing insolvency/bankruptcy risk. If actual or perceived insolvency risk exists, the focus of the firm shifts from prudent decisions with the objective of maximising the long-term value of the assets to a short-term focus on generating enough cash to meet debt obligations falling due. Long term planning and investment are put on hold because equity holders and management (correctly) perceive that the firm will not make it to the long term unless it meets those debt obligations (at least not in its currently structured form).
- B. Given your answer to question A, what is an efficient debt funding strategy for Aurizon’s regulated rail access operations given its current operating environment including the current regulatory regime?
4. The QCA has previously stated, and I agree, that the regulatory strategy that best manages insolvency risk given the QCA’s on-the-day methodology for compensating for debt costs is known as the “hybrid” strategy. Under this strategy, the regulated business has:
 - a. Issues N year floating rate debt (where N is around 10-years). Such debt contracts specify that the business pay the “floating” (i.e., updated every quarter) 3-month bank bill swap rate (BBSW) plus a fixed debt risk premium (DRP). Under this approach the risk-free base rate of interest is floating while the credit risk component (DRP) is fixed; but
 - b. This underlying floating base rate of interest is converted into a fixed base rate of interest at the beginning of each regulatory period by entering a pay fixed receive BBSW swap rate for the length of the regulatory (R years).

5. Consequently, the cost of debt for the business during the regulatory period is equal to the R year swap rate at the beginning of the regulatory period plus a trailing average debt risk premium (measured relative to the N-year swap rate at the time debts were issued (if the debt is 10-year debt then N=10)). Given that R is typically less than N and the yield curve is upward sloping, the hybrid strategy will have a lower expected interest cost than the trailing average strategy.
- C. Given your answer to question B, what risks and costs would be created for Aurizon if the QCA implemented compensation for the cost of debt based on a trailing average from FY28 onwards without any transition?
6. Given Aurizon's efficient debt management strategy is the hybrid then, in 2028, it will have a base rate of interest that 100% reflects prevailing market conditions in 2028. Imposing a trailing average at that time, which 90% reflects historical market conditions over the previous 9 years, has a small but non-trivial risk of forcing a business Aurizon's position into insolvency/bankruptcy. This will be the case if interest rates rise precipitously between now and 2028.
 7. Even if it does not result in actual insolvency, the same policy may create heightened insolvency risk. Either of these scenarios (actual insolvency or heightened risk of insolvency) would be very costly to both the regulated business and the efficient operation of that business (i.e., to customers) for the reasons described in my answer to Question A. These risks are especially heightened for Aurizon relative to the other businesses regulated by the QCA because the next regulatory reset is so distant from now.
- D. How could the QCA amend its draft report approach for Aurizon to reduce or eliminate the risks and costs identified in your answer to question C?
8. The QCA could materially reduce this risk (and the associated costs) by simply adopting the hybrid debt management strategy as the benchmark used to set compensation for the cost of debt. Given this is already the efficient debt management strategy for a firm in Aurizon's position no transition would be required. This has been the approach of the Western Australian and New Zealand economic regulators. There would be other advantages to this approach discussed in relation to Question E and F. Alternatively, the QCA could put in place a replicable transition from the current efficient debt management strategy (the hybrid) to the trailing average.
- E. To what extent is weighting of the trailing average cost of debt (or DRP under the hybrid approach) appropriate?
9. I am instructed that Aurizon's regulatory asset base may not be stable in the future (e.g., be materially declining in the future due to accelerated depreciation and may, or may not, experience large increases in the event that discrete capacity expansions

are undertaken) and that the QCA's estimate of the benchmark efficient gearing may also change.

10. In this context, if the QCA adopts a trailing average benchmark it should be weighted by the amount of debt that must be raised in each year (a function of the change in the RAB and any change in assumed gearing).¹ If the QCA were to adopt a simple trailing average that did not reflect the actual debt funding requirements then this could materially raise regulatory mismatch (and, therefore, insolvency) risk.
 11. Under the hybrid approach there is less of an imperative to weight by debt funding requirements in each year because 100% of the base rate is updated at the beginning of every regulatory period (both in the regulatory benchmark and by the business). Consequently, the prospect for regulatory mismatch risk is limited to the trailing average DRP.
- F. Please explain the relative advantages and disadvantages of the QCA draft report approach and the alternative approaches you have identified in your answer to question D?
12. The hybrid benchmark has the following advantages over the simple trailing average cost benchmark for setting the cost of debt for Aurizon:
 - a. The hybrid benchmark does not expose Aurizon to untenable risk of insolvency/bankruptcy;
 - b. The hybrid benchmark does not require a transition because it is consistent with the currently efficient debt management strategy;
 - c. The hybrid benchmark will have lower expected costs than the trailing average due to the use of a shorter term for the base rate than 10-years; and
 - d. Due to its greater reliance on prevailing market interest rate, the hybrid benchmark:
 - i. does not have the incentive problems associated the unweighted trailing average;
 - ii. can avoid the complexity associated with a weighted trailing average;
 - iii. is more easily replicable than the unweighted trailing average and, therefore, has lower regulatory mismatch risk;
 - iv. is more able to flexibly deal with material changes in the Aurizon's RAB over time; and

¹ With large capital investments this could involve weights well in excess of 10% in a given year and, alternatively, with sufficiently accelerated depreciation this could be close to zero or even negative in a given year. If the QCA were to adopt a simple trailing average that did not reflect the actual debt funding requirements then this could materially raise regulatory mismatch (and, therefore, insolvency) risk.



- v. generally, preserves greater flexibility for any future changes in the benchmark debt management strategy (noting that it takes 10-years to transition into or out of a 10-year trailing average).
 - 13. I do not consider that there are any significant disadvantages associated with the hybrid method relative to the trailing average method.
- G. Please advise whether the QCA's proposal to, when setting the cost of debt, rely solely on estimates of 10-year BBB+ corporate bond yields as published by the RBA is good regulatory practice?
- 14. I consider that there is compelling evidence that an average of multiple third-party estimates of the cost of debt (e.g., from RBA, Bloomberg and Thomson Reuters) will be more accurate and reliable than an estimate based on the RBA alone. This is partly due to the specific way the RBA index is constructed and partly because an average of a larger sample is generally more reliable.,
- H. Aurizon's network is an input into supplying coal haulage operations and, for some institutions, lending to a stand-alone rail manager of the CQCN would be in contravention of "environmental, social, and governance" (ESG) criteria that they have adopted. In your opinion, what implications might this have?
- 15. These circumstances may raise the efficient cost of debt for Aurizon relative to other firms with the same credit rating that are not affected in the same way by ESG criteria. If so, the QCA may need to implement a bespoke amendment to the cost of debt estimates from the RBA, Bloomberg and Thomson Reuters.

1 Introduction

16. My name is Tom Hird, and I have a Ph.D. in Economics from Monash University and over 25-years' experience as a professional economist.
17. I have been engaged by Aurizon Network (**Aurizon**) to prepare an expert report addressing the following instructions and questions which I answer in the rest of this report.

Instructions

The expert is instructed that Aurizon's coal haulage rail network is regulated under an "on-the-day" approach to the cost of debt. Under this approach, the cost of debt is reset close to the beginning of each regulatory period based on the estimated cost of 10-year BBB+ fixed rate debt and prevailing risk-free rates at that time. This was the approach used to set debt compensation in the current period (FY18 to FY23) and it will be the implied approach used to set debt compensation for the cost of debt in the period (FY24 to FY27). The QCA is proposing, in its June 2021 Rate of Return review draft report, to change this method to a simple (unweighted) 10-year trailing average of 10-year fixed rate debt. This would only come into force for Aurizon Network for the regulatory period commencing in FY28 for a term to be determined. The same draft report states that the QCA proposes not to require transition arrangements to implement the new 10-year trailing average debt management strategy.

Questions

The expert is to provide a report that addresses the following questions:

- A. *What defines an efficient debt funding strategy for a regulated monopoly with high levels of sunk investment? Please describe the extent to which this depends on managing refinance risk and the risk of mismatch between the businesses' debt costs and the debt allowance as set under the regulatory regime?*
- B. *Given your answer to question A, what is an efficient debt funding strategy for Aurizon's regulated rail access operations given its current operating environment including the current regulatory regime?*
- C. *Given your answer to question B, what risks and costs would be created for Aurizon if the QCA implemented compensation for the cost of debt based on a trailing average from FY28 onwards without any transition?*
- D. *How could the QCA amend its draft report approach for Aurizon to reduce or eliminate the risks and costs identified in your answer to question C? In answering this question, please have regard to:*
 - a. *The Western Australian Economic Regulation Authority's approach to implementing a hybrid of the trailing average and on-the-day approaches to compensating for the cost of debt;*

- b. *The AER’s approach to transitioning from the on-the-day approach to a 10-year trailing average; and*
 - c. *Any other concepts or regulatory precedent you consider relevant.*
- E. *To what extent is weighting of the trailing average cost of debt (or DRP under the hybrid approach) appropriate? In answering this question, please consider the possibility that Aurizon’s regulatory asset base may not be stable in the future (e.g., be materially declining in the future due to accelerated depreciation and may, or may not, experience large increases in the event that discrete capacity expansions are undertaken) and that the QCA’s estimate of the benchmark efficient gearing may also change?*
- F. *Please explain the relative advantages and disadvantages of the QCA draft report approach and the alternative approaches you have identified in your answer to question D? Please identify which of these approaches is most desirable in relation to:*
 - a. *Most accurately compensating for the efficient funding costs of a benchmark efficient firm in the same operating environment as Aurizon’s network business;*
 - b. *Minimising the expected level of efficient funding costs incurred by a benchmark efficient firm in the same operating environment as Aurizon (and, therefore, minimising the amount paid by Aurizon’s customers);*
 - c. *Minimising the complexity, and maximising the flexibility, of the regulatory regime to changing future circumstances (including instability in Aurizon’s regulatory asset base).*
- G. *Please advise whether the QCA’s proposal to, when setting the cost of debt, rely solely on estimates of 10-year BBB+ corporate bond yields as published by the RBA is good regulatory practice?*
- H. *Aurizon’s network is an input into supplying coal haulage operations and, for some institutions, lending to a stand-alone rail manager of the CQCN would be in contravention of “environmental, social, and governance” (ESG) criteria that they have adopted. In your opinion, what implications might this have, either now or in the future, for:*
 - a. *The debt costs for a benchmark efficient business in Aurizon’s operating environment; and*
 - b. *The QCA’s framework for estimating benchmark efficient debt costs.*

2 Question A: What defines an efficient debt management strategy

What defines an efficient debt funding strategy for a regulated monopoly with high levels of sunk investment? Please describe the extent to which this depends on managing refinance risk and the risk of mismatch between the businesses' debt costs and the debt allowance as set under the regulatory regime?

2.1 Refinance risk and regulatory mismatch risk

18. An efficient debt management strategy for a regulated monopoly must manage two distinct sources of risk:
 - a. Refinance risk: which is the risk that the business is unable to refinance debt as it comes due (or only able to do so at very disadvantageous terms); and
 - b. Regulatory mismatch risk: which is the potential for a mismatch between the regulated firm's actual debt costs and the compensation for debt costs given by the regulator.
19. Refinance risk can occur if a firm has large amounts of debt requiring refinance when either: debt markets in general are not functioning well; or the firm itself is experiencing financial stress such that debt markets are wary of lending to it. Examples of the former include the financial crisis experienced globally in 2008/09 but also regional financial crises such as the 2010 to 2015 Eurozone crisis and the 1997 Asian financial crisis. Examples of the latter might include periods of heightened uncertainty about the firm's ongoing creditworthiness, such as an airport in a pandemic or a stand-alone thermal coal railway company in a period of heightened uncertainty about climate policy and/or the failure of major coal customers.
20. Consistent with the need to limit refinance risk, evidence from businesses regulated by the Australian Energy Regulator (**AER**) is that the formal debt management strategies adhered to by regulated businesses typically require no more than 15% to 25% of debt can fall due in a given year.² The QCA has also focussed on refinance risk as an explanation for why businesses tend to have staggered maturity profile:³

² AER, *Explanatory Statement to the Rate of Return guideline*, December 2013, p. 139.

³ QCA, *Trailing average cost of debt*, April 2015, pp. 8-9.

... regulated firms tend to stagger their debt such that there is not too high a proportion of existing debt that is maturing in any one year (QCA, 2014d: 14; QTC, 2014c: 6; Lally, 2015: 10–11).

21. Regulatory mismatch risk will exist where the regulated business’s debt management strategy gives rise to an actual cost of debt that is materially different to the cost of debt compensation set by the regulator. This might arise because:
- The regulator sets cost of debt compensation based on the costs of a prudent debt management strategy, but the regulated business chooses (for whatever reason) to depart from that; or
 - The regulator sets cost of debt compensation based on an imprudent debt management strategy (such as rolling over 1 year debt) and the regulated business is unwilling to adopt that strategy (e.g., because it exposes the business to undue refinance risk).
22. The QCA has recognised the imperative of managing regulatory mismatch risk for regulated businesses.⁴

Regardless of the benchmark implemented by the regulator (i.e., on-the-day, trailing average, or hybrid), a firm subject to revenue or price determination has a strong incentive to 'match' that regulatory benchmark. This incentive arises because the regulator sets allowed revenues, and any difference between the allowed (i.e., benchmark) cost of debt and the firm's cost of debt will effectively flow to (or from) the firm's equity holders.

If the benchmark firm is able to match the benchmark debt servicing costs relatively closely, it can substantially reduce this source of volatility to its equity holders (QCA, 2014d: 26). The regulator's specification of a benchmark, therefore, implies a corresponding debt management strategy for the regulated firm (Lally, 2014a: 8–9; SFG Consulting, 2012: 5).

A firm subject to a different form of regulation (e.g., price monitoring) might have different incentives to match the regulatory benchmark.

23. Regulatory mismatch risk and refinance risk can interact. For example, imagine a regulator that set the cost of debt based on an “on-the-day” methodology such as the QCA has applied to Aurizon to date. Under this approach the cost of debt compensation the business receives during a regulatory period is based on the cost of debt prevailing at the beginning of the regulatory period. For the sake of illustration, imagine that, at the beginning of a regulatory period at time “t=0”, the prevailing cost of debt was 3%.

⁴ QCA, Trailing average cost of debt, April 2015, p. 9.

24. However, imagine that, notwithstanding the regulatory policy being clear, a regulated business did not manage its debt portfolio to this on-the-day regime. For example, imagine the regulated business relied solely on a single 15-year debt issued 10-years earlier at time “ $t=-10$ ” at a time when debt costs were 10%.
25. In this scenario, the regulated business will have debt costs that are 7% higher than debt compensation over the regulatory period $t=0$ to $t=5$. This magnitude of difference between debt cost and debt compensation is likely to put the regulated business into financial distress by the end of that regulatory period ($t=5$). However, that is precisely when 100% of their debt (being a single 15-year bond issued at $t=-5$) falls due.
26. The need to refinance 100% of its debt at a time when the business is already in financial distress may mean the business is unable to refinance its debt (goes into insolvency/bankruptcy) or is forced to do so at very unfavourable terms (paying a ‘financial distress’ premium). Even if the latter is true (and insolvency/bankruptcy is avoided) the business’s debt costs will again be higher than the regulator’s compensation for debt costs by the value of the ‘financial distress’ premium⁵ - creating heightened risk of future insolvency/bankruptcy risk.
27. In this example, regulatory mismatch risk creates the conditions (business specific financial distress) for the worst outcomes from refinance risk to be realised.

2.2 The primary goal of efficient debt management is to avoid insolvency/bankruptcy costs

28. If actual or perceived insolvency risk exists, the focus of the firm shifts from prudent decisions with the objective of maximising the long-term value of the assets to a short-term focus on generating enough cash to meet debt obligations falling due. Long term planning and investment are put on hold because equity holders and management (correctly) perceive that the firm will not make it to the long term unless it meets those debt obligations (at least not in its currently structured form).
29. In the finance literature it is recognised that high costs associated with insolvency/bankruptcy cause firms to both spread their debt maturities out through time and not to adopt extreme levels of gearing (despite tax advantages of gearing).

⁵ This assumes the regulator adopts a benchmark approach and does not raise its compensation based on the costs incurred by the regulated business.

Baxter (1967)⁶ was one of the first to make this point but many authors have built on his insight since.⁷

30. Imprudent debt management structures (too high a gearing and/or too much debt falling due in any given period) exposes the firm to the “risk of ruin”. Insolvency or near insolvency imposes costs on a range of parties, including:
 - a. Debt investors: insolvency means that debt holders do not get paid when debts fall due (a technical default). Debt investors will typically incur significant costs to manage that disruption (such as curtailing consumption/investment in other activities or borrowing from third parties – often at penalty rates due to the financial distress caused by the original technical default). If they cannot manage the technical default, then they will themselves be rendered insolvent (unable to pay their debts as they fall due); and
 - b. Equity investors: insolvency (or near insolvency) means that equity investors must stop receiving a dividend on their investment, which they have to manage in the same manner as debt investors and with analogous consequences. Equity investors will also suffer because the business’s reputation as a reliable borrower will be damaged. Moreover, existing equity investors may be forced to participate in a rights issue and/or a public equity raising to address the insolvency. Both options are likely to involve substantial transaction costs for equity investors (including the dilution of the value of existing equity investors by new equity investors).
31. Depending on the nature of the contracts with debt holders, insolvency may also give rise to debt holders taking full or partial control of the company and, potentially, to bankruptcy proceedings. Protracted legal battles may ensue between debt and equity holders (and between different groups of debt/equity holders) over the future of the firm. This may paralyse management, with the principal focus being on the division of the existing value of the firm (and debt holders attempting to ensure the maximum repayment of their debts) rather than on maximising the total value of the firm (including the equity stake).
32. As described above, it at this point long term planning and investment are put on hold precisely because the long-term future of the firm (as currently structured) is in doubt.

⁶ Baxter, N., "Leverage, Risk of Ruin and the Cost of Capital," *Journal of Finance* 22, September 1967, pp. 3956-403.

⁷ For example: Stiglitz, J.E., "A Re-Examination of the Modigliani-Miller Theorem," *American Economic Review* 59, December 1972, pp. 784-793; Kraus, A. and R.H. Litzenberger, "A State Preference Model of Optimal Financial Leverage," *Journal of Finance*, September 1973, pp. 911-922; and Kim, E.H., "A Mean-Variance Theory of Optimal Capital Structure and Corporate Debt Capacity," *Journal of Finance* 33, March 1978, pp. 45-63.

33. These costs can destroy the value of a firm that would, had it adopted a more prudent capital management strategy, never have become insolvent in the first place. Moreover, the disastrous nature of the potential transaction costs associated with insolvency (and bankruptcy), can see a firm in moderate financial distress quickly spiral into insolvency. This is because debt investors may be unwilling to fund the firm (or only at penalty interest rates) for fear of subsequent exposure to these costs. In other words, if there is perceived to be the potential for insolvency, this can become a self-fulfilling prophecy.
34. It is for these reasons that transaction costs associated with insolvency/bankruptcy play a key role in the 'real world' analysis of optimal capital management plans. Any change to capital management strategy can materially influence the likelihood (or perceived likelihood) of insolvency/bankruptcy, and so the probability of these substantial costs being incurred. It is important to recognise that there does not need to be an imminent threat of insolvency or bankruptcy for these factors to have a material bearing upon a firm's optimal capital management strategy. What matters is the potential effect of a particular strategy on expectations.
35. If a less prudent capital management strategy raises the probability of future insolvency/bankruptcy – by any amount – this will reduce the expected (actuarially estimated) value of future cash-flows. This reduction will be equal to the change in probability of insolvency/bankruptcy multiplied by the expected additional transaction costs associated with mitigating those outcomes. Given the substantial magnitude of those costs, even small increases in the probability of those outcomes transpiring (e.g., from 0% to 5%) can have a significant effect on expected future cash-flows and, in turn, on the efficient debt management strategy.
36. Equally, if one aspect of a debt management strategy raises insolvency/bankruptcy risks another aspect of the debt management strategy might need to be made more conservative so that the net impact is reduced. For example, consider a firm exposed to high levels of refinancing risk due to heavy reliance on short term or lumpy debt maturity profile. This firm may seek to raise debt well in advance of that refinance being needed and to raise equity (including by, but not limited to, reducing dividends) in order to reduce firmwide gearing.
37. Such strategies may manage down the expected transaction costs of insolvency/bankruptcy but at the expense of higher other transaction costs (e.g., higher tax costs associated with lower gearing and line of credit fees/carrying costs associated with prefunding debt maturity).

2.3 Approach of credit rating agencies to refinance risk

38. The approach of credit agencies to the assessment of refinance risk has been summarised by Kanangra:⁸

Rating agencies do not stipulate the debt amount for the capital structure for an issuer. Neither do they counsel issuers on the most appropriate markets for raising debt, nor the term of the debt. However, rating agencies are looking for issuers to be conservative in their approach to the debt markets.

Factors which the rating agencies seek in highly rated users are:

- ***A company with a spread of maturities to its debt, such that only a small proportion of its debt matures within each year;***
- ***Refinance of maturing debt within 6-9 months of its maturity. Early refinancing obviates the risk of the issuer not being able to refinance a tranche of debt if there is a market disturbance when the debt is maturing; and***
- ***Access to liquid funds.***

Neither rating agency has published rules concerning debt maturity or refinance. Neither are direct ratings drivers, but both contribute to a well-managed company and go towards stronger ratings.

*Liquidity is however a significant consideration for rating agencies. **The rating agencies take the approach that a company cannot be investment grade (IG) without adequate liquidity.** In order to be IG an issuer must not only satisfy the long-term metrics but must also have acceptable liquidity. **Both agencies measure liquidity by calculating the ratio of the assured cash sources over the next 12-24 months to the cash uses over the same time period.** In each rating opinion [for a specific firm] each agency has a section on liquidity, in which it describes the sources and uses of cash for the next 12-18 months.*

39. In short, having a large fraction of all debt refinanced in any given year would not provide “a spread of maturities to its debt, such that only a small proportion of its debt matures within each year” and would create a large cash requirement (including the cash necessary to repay all debts falling due) that would exceed the assured cash sources over the same period (at least for a regulated business with relatively stable cash flows).

⁸ Kanangra, Credit Ratings for Regulated Energy Network Services Businesses, p. 26.

3 Question B: Efficient strategy given Aurizon's operating environment

Given your answer to question A, what is an efficient debt funding strategy for Aurizon's regulated rail access operations given its current operating environment including the current regulatory regime?

40. Based on my answer to question A, the efficient debt management strategy for Aurizon will be the debt management strategy that minimises regulatory mismatch risk subject to also minimising refinance risk.
41. Naturally, the debt management strategy that minimises regulatory mismatch risk for Aurizon depends on how the regulated cost of debt compensation for Aurizon is determined. I am instructed that the debt compensation for Aurizon is reset close to the beginning of each regulatory period based solely on prevailing debt market conditions at that time. I am instructed that this was the approach used to set debt compensation in the current period (FY18 to FY23) and it will be the implied approach used to set debt compensation for the cost of debt in the period (FY24 to FY27). This approach is generally described as an "on-the-day" approach – including by the QCA.⁹
42. In what follows I distinguish between the risk free "base rate" rate of interest and the "credit risk" component (debt risk premium or DRP). The risk-free base rate is the component that can be manipulated by the business using interest rate swaps (and/or issuing floating base rate bonds). The DRP is always fixed at the time a debt is issued.
43. The QCA's on-the-day approach is to set the cost of debt based on:
 - a. a debt risk premium based on issuing a 10-year BBB+ debt; plus
 - b. transaction costs associated with a strategy of converting the base rate of interest from 10-year to 4 years (where 4 years has in the past matched the term of regulatory period); plus
 - c. the 4-year risk free rate; plus
44. The QCA describes this as compensating the following strategy.¹⁰

This strategy assumes an efficient firm would:

⁹ QCA, Trailing average cost of debt, April 2015, p.10.

¹⁰ Aurizon Network's 2017 draft access undertaking, December 2018, Appendix F: Assessment of individual WACC parameters, p. 138.

- a. *issue debt with a 10-year term to maturity to reduce refinancing risk and incur transaction costs associated with issuing this debt*
 - b. *use interest rate swap contracts to convert the base interest rate element of its cost of debt from the raw term to a term that matches the length of the regulatory period (4 years), and incur the associated transaction costs*
 - c. *use credit default swap (CDS) contracts to convert the 10-year debt risk premium embedded in the average term of debt into a four-year debt risk premium.*
45. However, as the QCA acknowledges, there is no liquid CDS market and a strategy of refinancing all debt at the beginning of every 4-year regulatory period with 10-year debt is simply unworkable. If a firm attempted to refinance all debt at the beginning of each 4-year regulatory period they would need to issue 4-year debt. Moreover, even such a strategy (refinancing all debt at the same time) would expose the business to untenable levels of refinance risk (and would mean an investment grade credit rating was unlikely to be attainable even with only modest debt gearing).
46. In this context, the most efficient debt management strategy is one that simultaneously:
- a. *Manages refinance risk by issuing long term debt such that a staggered maturity profile exists with only relatively small amounts of total debt falling due in any given year (e.g., 10% of debt falling due each 12 months on average associated with a 10-year debt issuance strategy);*
 - b. *Manages regulatory mismatch risk by using swap transactions to reset the base rate of interest at the same time that the regulator sets the cost of debt allowance.*
47. The QCA has previously described this as the most efficient way for a regulated business to manage both refinance and regulatory mismatch risk under the on-the-day regime.¹¹

The on-the-day approach determines an allowed return on debt for the regulated firm as the sum of a prevailing risk-free rate and a prevailing DRP. As a result, both parameters are estimated over a short period (i.e., typically 20–40 days) closely preceding the start of the regulatory cycle to reflect current (i.e., on-the-day) rates.

...

Firms will have the incentive to match this benchmark, subject to managing various risks. As discussed in section 3.1.3, firms tend to manage refinancing risk by taking out long-term debt and by staggering that debt.

¹¹ QCA, Final decision, Trailing average cost of debt April 2015

The QCA's approach recognises the potential for refinancing risk and determines an efficient (i.e., benchmark) term of debt (QCA, 2014i: 217–218). To date, this term has been estimated at about 10-years (PwC, 2013: 19–20).

Given the use of long-term debt, an efficient firm would have the incentive to align its debt with the regulatory reset, consistent with the matching policy. The regulated firm can employ both interest rate swaps and credit default swap (CDS) contracts to achieve this objective. In summary, the implied debt management strategy involves the regulated firm (e.g., for a five-year reset):

- (a) issuing an efficient term of debt (e.g., 10-years) to manage refinancing risk (with respect to frequency), where the rate is set over a short period (e.g., 20 days) immediately prior to the start of the regulatory cycle*
- (b) using interest rate swap contracts to manage interest rate risk by converting the base rate of the 10-year cost of debt such that the term matches that of the regulatory cycle (e.g., five years) using CDS contracts to convert the 10-year DRP embedded in the average term of debt into a five-year DRP.²⁴*

However, in practice, it is difficult to hedge the DRP using CDS contracts due to the lack of market liquidity in these instruments (PwC, 2013: 8). The QCA's approach recognises that the market for CDS contracts is illiquid, and accordingly assumes that firms do not use CDS contracts at this time. Therefore, the approach allows a 10-year DRP rather than a five-year DRP (QCA, 2014d: 3–6; Lally, 2010a: 11).

In practice, the mismatch between the benchmark DRP and the firm's DRP is managed in various ways, including by selecting the timing and market of debt issues.

48. In this passage the QCA arrives at the same conclusion as a number of other regulators (the AER, the Western Australian Economic Regulatory Authority (ERA) and the New Zealand Commerce Commission (NZCC)). Specifically, that the most efficient debt management strategy for a firm subject to the on-the-day regulatory regime is to issue long term staggered debt but to overlay this with an interest rate swap portfolio such that the base rate of interest can be reset at the same time the regulator sets the on-the-day cost of debt.
49. I note that of these three regulators:
- The ERA and the NZCC have reformed their former 'on-the-day' regime to directly model a staggered debt portfolio with an interest rate swap overlay. I shall follow common usage to describe this as a 'hybrid' cost of debt

allowance/debt management strategy. The term hybrid conveys that the cost of debt (benchmark and actual) is the sum of:

- i. an on-the-day base (risk free) rate of interest; plus
 - ii. a trailing average of debt risk premiums (DRP).
- The AER determined that it would move from an ‘on-the-day’ regulatory benchmark to a ‘trailing average’ benchmark. However, in recognition that the hybrid debt management strategy was the efficient strategy under the on-the-day regime the AER defined a transition from the on-the-day regime to the trailing average regime that would allow regulated businesses to manage regulatory mismatch risk during that transition.

3.1 Mechanics of the hybrid cost of debt strategy

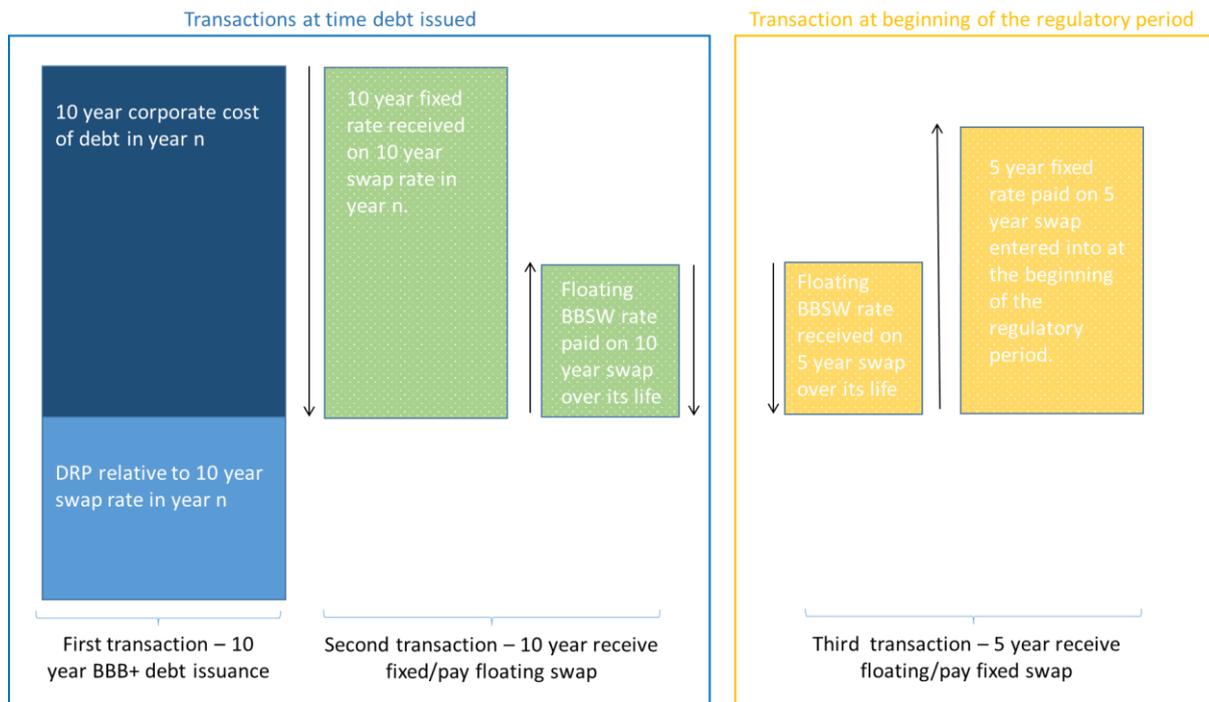
- 50. It is useful to describe in more detail the mechanics of the swap strategy underpinning the hybrid approach. In what follows I will assume that the regulated business maintains a portfolio of 10-year evenly staggered debts. However, the business makes use of floating rate debts and/or interest rate swap contracts to hedge its base rate of interest to the on-the-day regulatory allowance for the cost of debt.
- 51. I will also assume that the length of the regulatory period is 5-years (consistent with common practice amongst Australian regulators). I note that Aurizon has typically been subject to 4-year regulatory periods, but I also note that this may not be the case in the future.
- 52. Under the hybrid approach the business will:
 - Always issue floating rate 10-year bonds. Having done so, the business will have an underlying base rate exposure on the entire portfolio that is 100% floating at the 3-month bank bill swap rate.
 - Periodically, at the beginning of each new regulatory period, fix its underlying 100% floating base interest rate exposure for the length of the regulatory period by entering into a pay fixed/receive floating interest rate swap for 100% of its debt portfolio.
- 53. A 10-year floating rate bond will promise to pay the lender the 3-month bank bill swap rate (which resets at prevailing rates every 3-months) plus a fixed debt risk premium (DRP) which is constant over the full 10-years of the bond’s life. A functionally equivalent effect can be derived by issuing a 10-year fixed rate bond

and contemporaneously entering into a receive fixed/pay floating 10-year interest rate swap.¹²

54. It is necessary that 100% of the base rate of interest will be floating rate exposure at the beginning of each regulatory period because that is when the floating rate exposure can be hedged to the regulatory allowance using a pay fixed interest rate swap (as per o.□ above).
55. It is important to note that this strategy, once entered into, cannot be instantaneously unwound. Specifically, having followed this debt management strategy to manage regulatory mismatch risk in regulatory period “T” the business will have a cost of debt on its entire portfolio at the beginning of regulatory period “T+1” that is equal to:
 - The 3-month bank bill swap rate; plus
 - A 10-year trailing average of debt risk premiums
56. The mechanics of this strategy is described in Figure 1 below. In this figure it is assumed that the borrower issues a fixed rate bond and enters a contemporaneous receive fixed/pay floating interest rate swap.

¹² In this case, the receive fixed swap rate effectively ‘cancels out’ the same quantum of the fixed rate bond – leaving the borrower with a net exposure of the fixed rate on the bond in excess of the 10-year swap rate (the DRP) plus the pay floating exposure on the interest rate swap.

Figure 1: Mechanics of swap strategy underpinning hybrid

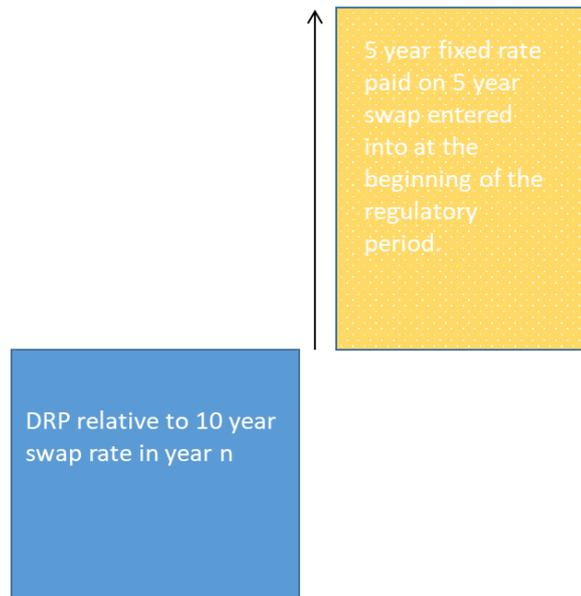


57. Moving from left to right in the above graphic describes the mechanics of the swap strategy underpinning the hybrid debt management strategy as it relates to the costs associated with a single bond issued in year “n”.
- First, the firm issues a 10-year fixed rate bond with a yield that is represented by the height of the first column (the sum of both the light and dark blue components of that column).
 - Second, the firm immediately enters into a 10-year swap contract (the components of which are the green coloured columns in the above figure) under which it:
 - is paid the 10-year fixed swap rate prevailing at that time (the business receives this same (fixed) rate over the 10-year life of the swap contract – which is also the life of the bond). The difference between the 10-year fixed swap rate and the yield on the corporate bond is, for future reference, how the light blue “DRP relative to 10-year swap rate in year n” is calculated;
 - must pay its counterparty the floating 3-month bank bill swap rate (BBSW) over the next 10-years. This is described as a ‘floating rate’ because the BBSW rate varies through time and the firm must make quarterly payments to the counterparty at a rate equal to whatever the prevailing 3-month BBSW rate is at that time.

- c. (Note that if the business issued a 10-year floating rate bond instead of a fixed rate bond the combined cost would be the same. Namely the light blue DRP plus the green BBSW rate. Rather than cancelling out, the larger dark blue and green restables would simply not exist.)
 - d. Third, at the beginning of the next regulatory period, the firm enters into a 5-year swap contract (the two components of which are coloured yellow in the above figure) under which it:
 - i. must pay the 5-year fixed swap rate prevailing at that time (the business receives this same (fixed) rate over the 5-year life of the swap contract – which is also the life of the regulatory period);
 - ii. is paid by its counterparty the floating 3-month bank bill swap rate (BBSW) over the next 5-years.
58. It is useful to make the following observations about the above mechanics.
- a. The middle two green and yellow floating BBSW rate amounts ‘cancel out’ so these have no net effect on the costs of the strategy.
 - b. The DRP on the bond at the time of issuance (measured relative to 10-year swap rates) is not altered and is payable every year over the life of the bond.
 - c. The third step is undertaken to hedge not just already existing bond/swap combinations created in steps 1 and 2 but also to hedge bond/swap combinations expected to be created over the course of the regulatory period. Consider a 10-year bond issued at the end of the third year of a regulatory period - with the proceeds used to refinance a bond of equivalent value that is maturing at that time. At the beginning of the regulatory period the business will have entered into a 5-year (pay fixed/receive floating) swap that hedged:
 - i. the 3 years of floating rate exposure on the old (already existing) bond/swap combination maturing at the end of year 3; and
 - ii. the 2 years of floating rate exposure on the new bond/swap combination that will be issued/entered into at the end of year 3.
 - d. At any point in time, the impact of all of these steps may be to raise or lower the total cost of debt relative to a simple trailing average with no swap contract overlay. It will depend on the shape of swap yield curves, the movements in swap rates between bond issue date and the beginning of the regulatory period and also the level of transaction costs associated with the swaps. However, on average, it can be expected that this method will lower debt costs relative to a trailing average because the base rate of interest is set at 5-years rather than 10-years (and 5-year rates are typically lower than 10-year rates) and this is typically more than any swap transaction costs.
59. Figure 1 includes a number of elements that ‘cancel out’ across the entire strategy. In particular, the two floating rate payments underpinning each swap cancel out. In

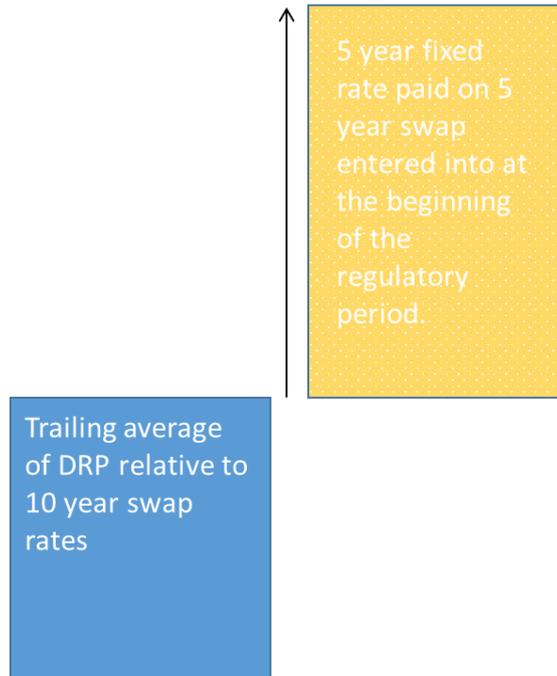
addition, the 10-year fixed swap rate received over the life of the bond effectively cancels out an equal amount of the 10-year yield on the bond. Figure 2 below shows a simplified version of Figure 1 with the elements that cancel out excluded.

Figure 2: Simplified mechanics of swap strategy underpinning hybrid



60. Figure 1 and Figure 2 depict the impact of the swap strategy on a single bond. However, the impact of the swap strategy applied to each bond in the staggered debt portfolio is simply the sum of these. This is illustrated in Figure 3 below. The difference between Figure 2 and Figure 3 is simply that a trailing average DRP replaces the DRP on the single bond in Figure 2.

Figure 3: Aggregate cost of debt under the hybrid approach



61. In order to be an effective way of hedging to the regulatory allowance, the pay fixed rate swap contracts must be undertaken in the same period that the regulator uses to set the cost of debt allowance and must only last for as long as that cost of debt allowance will be paid.¹³ Only then will the business's interest rate exposure be purely floating at the beginning of the next regulatory period – enabling it to once more enter into 5-year fixed swaps to turn that floating rate exposure into a fixed rate exposure in the same market conditions that the regulator uses to determine the fixed cost of debt.

¹³ in past QCA practice for Aurizon this has been a 4-year regulatory period but, as noted above, I have provided my illustration with the generic 5-year regulatory period widely used by the QCA and other regulators in other industries.

4 Question C: Risks from adoption of a trailing average without transition

Given your answer to question B, what risks and costs would be created for Aurizon if the QCA implemented compensation for the cost of debt based on a trailing average from FY28 onwards without any transition?

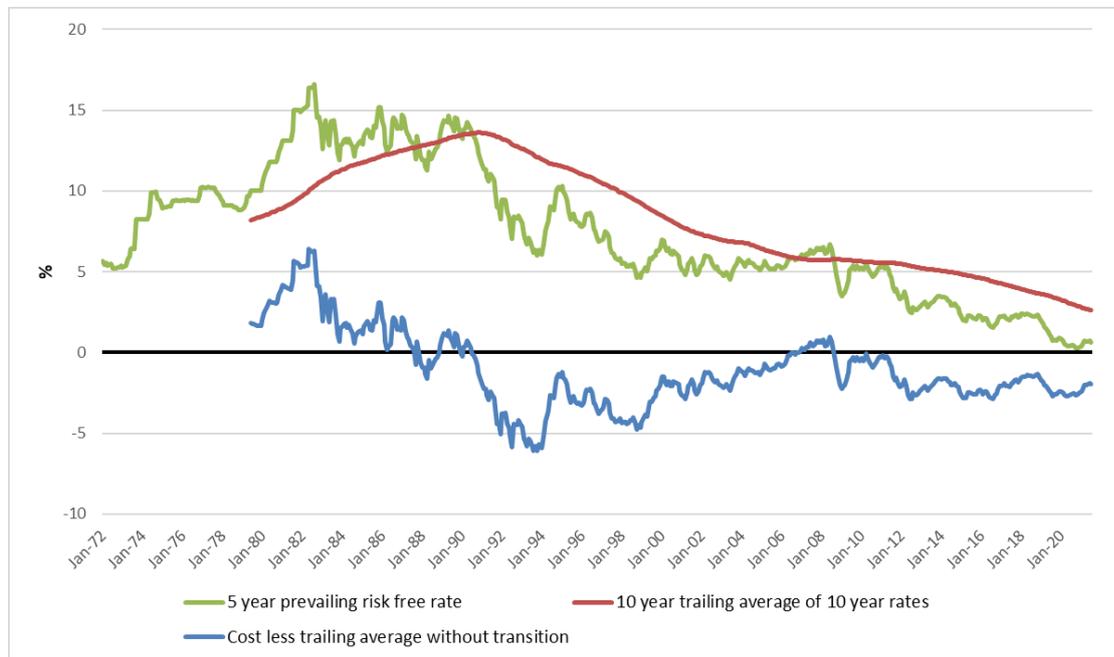
62. A regulated business that has designed their debt and interest rate swap portfolio to efficiently match the on-the-day regulatory allowance in one regulatory period will be unable to immediately match a trailing average regulatory allowance in the next regulatory period. This is true even if the regulated business has been given advanced warning of the proposed change in the regulatory regime.
63. This conclusion follows from the mechanics of the hybrid debt management strategy as set out in the previous section. Assume the that regulated business issues 10-year debt and that the regulator plans to move from an on-the-day regime in regulatory period “T” to a 10-year trailing average with no transition in regulatory period “T+1”. It follows that:
 - a. The regulatory regime in regulatory period “T” is the on-the-day regime;
 - b. If, in regulatory period “T+1”, the regulator immediately adopts a trailing average then compensation for the cost of debt will be equal to:
 - i. A base rate of interest that is a 10-year trailing average of 10-year swap rates; plus
 - ii. A trailing average DRP relative to the 10-year swap rate.
 - c. However, in order to efficiently manage regulatory mismatch risk in period “T” the regulated business must adopt the hybrid debt management. If so, the regulated business must start regulatory period “T+1” with:
 - i. A base rate of interest that is 100% the prevailing floating rate (i.e., the 3-month bank bill swap rate); plus
 - ii. A trailing average DRP relative to the 10-year swap rate.
64. If the regulated business left their base rate floating (i.e., did not enter any fixed rate swap contracts) then they would:
 - a. have effectively hedged their DRP costs to the regulatory allowance (i.e., cii equals bii); but
 - b. have a potentially large mismatch between their base rate of interest and the regulatory allowance (equal to ci less bi).
65. Of course, it would be imprudent to leave the base rate floating because this would create ongoing regulatory mismatch risk. For example, a 1.0% change in the 3-

month bank bill swap rate would immediately flow through to a 1.0 higher interest costs on the entirety of the businesses debt portfolio even though the higher BBSW rate may have no or little effect on the regulatory benchmark (a 10-year trailing average of 10-year rates).

66. The prudent response from a regulated business would be to transition to a fixed rate trailing average in the quickest way possible. This is set out in detail in section 5.3 “A replicable and efficient transition to a trailing average”. However, for the purpose of my answer to this question I simply rely on the fact that the regulated business transitioning from a hybrid to a trailing average strategy will begin the transition with a cost of debt approximated by:
 - The prevailing 5-year swap rate at that date; plus
 - A 10-year trailing average of DRPs to 10-year swap rates.
67. The latter will be matched to a trailing average allowance with no transition, but the former will not. For the former, there will be a mismatch to the extent that the prevailing 5-year swap rate is different to the 10-year historical average of 10-year swap rates.
68. In order to illustrate the potential magnitude of this mismatch I have used risk free rate data published by the RBA since June 1969.¹⁴ I have then compared the 10-year trailing average of 10-year risk free rates against the prevailing 5-year risk free rate (noting that the regulated business transitioning from a 100% floating rate exposure to a 10-year trailing average will enter into 1 to 10-year swaps with an average maturity of around 5-years).
69. The difference between these two series is an estimate of the size of the regulatory mismatch that would have existed at that date if the regulator moved (without any transition) from an on-the-day regime to a 10-year trailing average regime. This difference is captured by the blue time series in Figure 4 below.

¹⁴ I use yields on Government bonds because these are available for a longer time period in Australia than interest rate swap yields. This is a good approximation to the same analysis being performed with interest rate swaps had interest rate swaps been in existence for this period. This is because interest rate swaps are a reasonably small and constant margin on government bond yields.

Figure 4: Regulatory mismatch created by moving from an “on-the-day” to “trailing average” regime without transition*



*Based on historical interest rate data from 1969 onwards as published by the RBA in publication “F2 Capital Market Yields - Government Bonds”

70. Based on historical patterns of interest rates, the regulatory mismatch has been as high as positive 6% (i.e., costs 600bp higher than regulatory compensation) and as low as minus 6% (i.e., costs 600bp below the regulatory benchmark).
71. The regulatory mismatch is most positive when prevailing interest rates are higher than they were, on average, in the previous 10-years (as was the case in the early 1980s). Similarly, the regulatory mismatch is most negative when prevailing interest rates are lower than they were, on average, in the previous 10-years.
72. Over the last 30 years, the regulatory mismatch has been typically negative because interest rates have been falling on average over that period – such that the prevailing 5-year interest rate is lower than the average of 10-year interest rates over the previous 10-years. The one exception to that is the first half of 2008 when prevailing 5-year interest rates were slightly higher than the average of 10-year rates over the previous 10-years.
73. The last observation in this chart for July 2021 shows that if a regulatory period ended in July 2021 and the regulator moved immediately from an on-the-day to a trailing average regime (with no transition) the regulatory mismatch would be -2.0%. That is, the regulated business would have base interest costs (based on an average of 1 to 10-year fixed rate swaps taken out in July 2021) that were 2.0% lower than the base rate in the regulatory allowance (based on a 10-year trailing average of base rates).

74. In other words, moving straight to a trailing average without a transition in June 2021 would overcompensate a regulated business by around 2.0% in the first year (falling to 0% by 2031 when costs and compensation will be aligned).
75. In this sense, if implemented right now, the QCA policy of no transition would not impose regulatory mismatch risk on Aurizon. It would, if anything, provide a windfall to Aurizon relative to its efficient costs.
76. However, this policy change will not be implemented today for Aurizon. Rather, it will be implemented in 2028 and much can change in financial markets over that time period. The QCA policy of no transition may be relatively low risk for businesses whose next regulatory reset is soon. However, it is not low risk for Aurizon given the length of time until that next regulatory reset.
77. Aurizon will continue to be subject to compensation based on the on-the-day regime up to June 2028. To the extent that interest rates rose between now and June 2028 then Aurizon could face material under compensation relative to its costs if a trailing average is immediately implemented by the QCA and imposed on Aurizon at the next regulatory reset. Figure 5 below illustrates the under-compensation that Aurizon will suffer in the year beginning July 2028 if interest rates (both 5 and 10-year) gradually but steadily returned to the pre global financial crisis (pre 2008/09) levels.

Figure 5: Regulatory mismatch created by moving from an “on-the-day” to “trailing average” regime without transition*



*Based on historical interest rate data from 1969 onwards as published by the RBA in publication “F2 Capital Market Yields - Government Bonds” plus an assumption that interest rates steadily rise to pre 2008/09 levels between June 2021 and June 2028.

78. In the scenario described in Figure 5 Aurizon would be forced to pay interest rates of around 6.4% based on prevailing interest rates in 2028 (the last observation on the green line). However, compensation would only be around 3.3% based on 10-year trailing average of 10-year interest rates (the last observational the red line). This leads to regulatory mismatch of 3.1% (the last observation on the blue line) such that Aurizon would have base rate debt costs roughly double its compensation for those costs.
79. Of course, this is just one of many possible scenarios and is, by no means, the most extreme. A worse scenario, from an Aurizon risk management perspective, would be if interest rates continued to decline for a period but then rose more sharply in the years immediately prior to June 2028. Figure 6 illustrates such a scenario under which Aurizon would have a regulatory mismatch of 4.3%.

Figure 6: Regulatory mismatch scenario: falling rates from June 2021 to June 2025 followed by rapidly rising interest rates to June 2028*



*Based on historical interest rate data from 1969 onwards as published by the RBA in publication “F2 Capital Market Yields - Government Bonds” plus an assumption that interest rates fall steadily from June 2021 to June 2025 and then rise rapidly to pre 2008/09 levels by June 2028.

80. The outcome described in Figure 6, or scenarios similar to it, is not an outcome that is likely to occur. This is true in the sense that it is not currently predicted to occur by financial market analysts, and it represents a steep increase in interest rates that we only see infrequently in the historical record.
81. That said, we do see very significant rises and falls in interest rates in the historical record. For example, there was an almost 4% rise from January 1994 to May 1995 and a 4% decline from July 2008 to July 2012. Aurizon would be “unlucky” to be on the wrong end of such an interest rate change, but it would not be impossible for this to occur.
82. This brings me back to my answer to Question A. The role of an efficient and prudent debt management strategy is to guard against the potential damage from being “unlucky”. If it was the case that the scenario’s modelled in Figure 5 and Figure 6 came to fruition it appears likely to me that a generic business in Aurizon’s operating environment might very well become insolvent/bankrupt.
83. That is, having a forecast deficit of 4% on a debt portfolio that is 55% of the value of assets could easily create circumstances where debt investors decline to refinance the regulated business’s debt (or only to do so at penalty DRPs which would themselves be uncompensated and feed into further insolvency risk). This is especially if other negative shocks were to hit that regulated business (such as the financial failure of major customer etc). That is, the regulatory mismatch could cause the regulated firm to fail.

84. Even if insolvency did not occur, the mere threat of insolvency would cause the regulated business to incur many of the costs associated with financial distress described in my answer to Question A and Appendix A. These costs can be extremely high even if insolvency is avoided.
85. I note that these risks are particularly high for Aurizon given that the trailing average would only be applied to Aurizon in 2028. As seen from the above charts, immediate adoption of the trailing average today would overcompensate for efficient costs incurred under the hybrid model (the blue line is currently below zero in the above charts). For regulated businesses where the trailing average would be implemented in the next few years one could take the view that there is a small probability of this being reversed before that time (such that regulatory mismatch risk could give rise to insolvency risk). However, for Aurizon the relevant date is ~7 years in the future, and it is highly uncertain what prevailing market conditions will exist at that time.
86. A prudent and efficiently run business would take steps to minimise not just the risk of insolvency but the risk of the risk of insolvency. The first step would be to submit that the regulator set regulatory compensation for the cost of debt post 2028 that is replicable for an efficiently managed regulated business given its operating environment pre-2028. I expand on this in my answer to Question D below.
87. However, if the regulator nonetheless imposed a trailing average without transition the regulated business would need to take steps to minimise the potential regulatory mismatch risk that this created post 2028. There are two options available to the business that would do this – both of which would involve significant costs.
- a. First, the business could radically reduce its own debt funding. For example, instead of funding itself with 55% debt the business could reduce that funding level to below 25%. This is not a simple process and would have the following costs:
 - i. Equity raising costs associated with raising the equity to fund lower gearing levels;
 - ii. Increases in tax costs as the tax shield of debt is lost (see Appendix A);
 - iii. Disruptions to relationships with debt lenders which would need to be rebuilt if debt levels were returned to optimal levels once the period of regulatory mismatch was past (around 2029)¹⁵
 - b. Second, the regulated business could seek to arrange bespoke derivative contracts (with financial institutions with sufficiently strong balance sheets)

¹⁵ In reality this mismatch period would extend out beyond that date as it is likely that the process of delveraging over 2022 to 2028 would also create a non-uniform trailing average internal cost of debt for the regulated business (with less than the assumed 10% per annum debt raised in the period 2022 to 2028 and more debt raised pre and post this period)

where those contracts would ‘pay out’ in circumstances where regulatory mismatch would be highest (prevailing interest rates above the 10-year trailing average). However, such a contract would need to be on a face value equal to the debt proportion of the RAB. It is hard to know whether there would be any willing counterparty for such a contract. However, it can reliably be estimated that, if a counterparty could be found, the cost of arranging such a contract (including the price paid above the actuarially expected cost) would be very high.

88. To the extent that the QCA does not implement one of the regulatory approaches I set out in my answer to Question D, I consider that it should include costs associated with the strategies set out above in its modelling of regulated building block costs.

5 Question D: How can the QCA eliminate regulatory mismatch risk?

How could the QCA amend its draft report approach for Aurizon to reduce or eliminate the risks and costs identified in your answer to question C? In answering this question, please have regard to:

- a. *The Western Australian Economic Regulation Authority's approach to implementing a hybrid of the trailing average and on-the-day approaches to compensating for the cost of debt;*
- b. *The AER's approach to transitioning from the on-the-day approach to a 10-year trailing average; and*
- c. *Any other concepts or regulatory precedent you consider relevant.*

89. For Aurizon to efficiently manage regulatory mismatch risk the QCA would need to either:
- a. Apply a transition from the on-the-day approach to the 10-year trailing average approach and, for the reasons explained in my answer to Question E, apply capex-based weights to that trailing average; or
 - b. Adopt the hybrid strategy as the new regulatory benchmark without any transition. In this case a transition is unnecessary because the QCA would be adopting a regulatory benchmark that matches the current efficient debt management strategy given the current on-the-day regime. Moreover, capex-based weights are less necessary because the on-the-day base rate is continually being reset at prevailing rates in a manner that is able to be hedged.
90. Both approaches would provide the regulated business with the ability to minimise regulatory mismatch risk. This is because both strategies involve the adoption of regulatory benchmark that is immediately replicable by a regulated business that has been efficiently managing regulatory mismatch risk under the QCA's on-the-day regime.

5.1 Three general principles for regulatory compensation for the cost of debt

91. More generally, I consider that the QCA should be guided by the following three principles when defining any regulatory compensation for the cost of debt including both: a long-term regulatory benchmark and any transition from one regulatory benchmark to the next.

- a. The QCA should define a benchmark efficient debt financing strategy that is capable of being replicated by an efficient business managing its debt portfolio prudently;
 - b. If the QCA benchmark efficient debt financing strategy changes from one prudent strategy to another prudent strategy, the QCA should define a replicable transition strategy that a business could implement to in order to minimise regulatory mismatch risk during that transition.
 - c. The QCA should estimate and compensate for the costs of efficiently implementing the benchmark strategy and any transition between benchmark strategies.
92. By way of specific examples in relation to each point listed above:
- a. A benchmark is replicable if a firm can implement a debt management strategy to closely align with the benchmark. A benchmark is both efficient and replicable if following that benchmark results in an appropriate trade-off between managing refinance risk and expected interest rate costs. For example, a benchmark of only issuing 1 year debt (or, at the other extreme, 40-year debt) might be technically replicable but would not strike an efficient balance between interest costs and refinance risk.
 - b. Consider the move from a 10 to a 5-year trailing average benchmark. A replicable transition path between the two replicable benchmarks would be to assume that, over a 10-year transition, the business replaces staggered maturity 10-year debt with 5-year debt as the former matures. Under this transition the trailing average would be a mix of 10 and 5-year debt costs (more heavily weighting the latter as the transition progresses).
 - c. Having defined the benchmark and/or transition to the benchmark the cost of implementing that approach should be estimated as closely as possible. For example, in the case of a transition from a 10-year to a 5-year trailing average, this would involve estimating the cost of 10 and 5-year debt at predetermined averaging periods and giving this debt the relevant weight in the trailing average.

5.2 The hybrid approach is immediately replicable and efficient

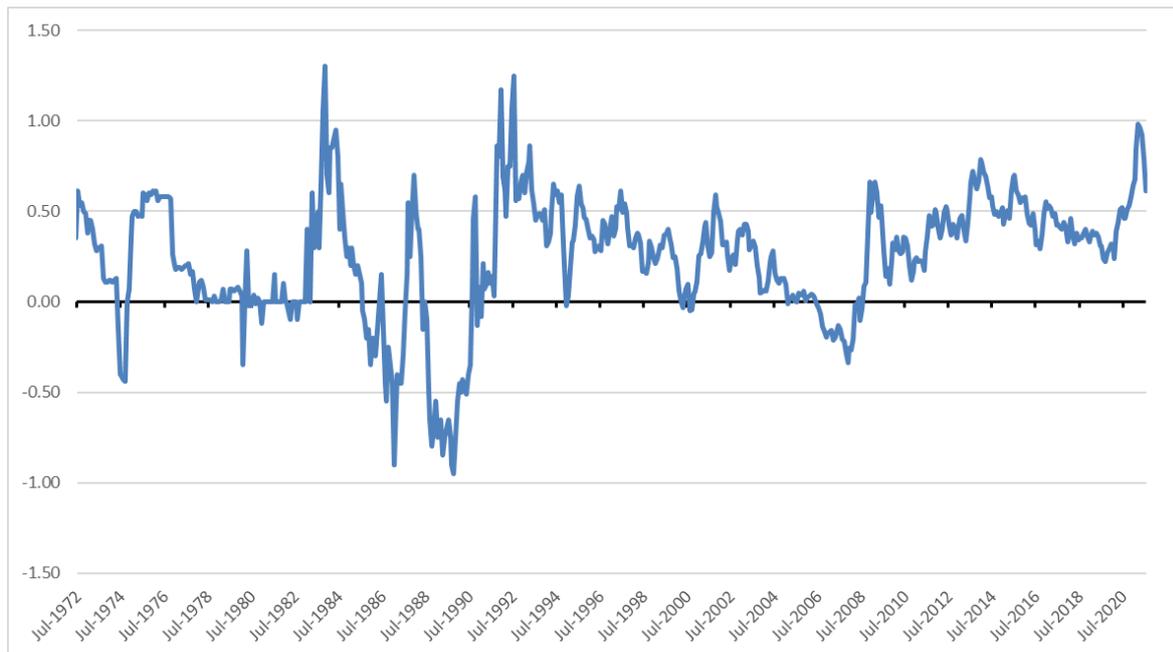
93. Under the hybrid debt management strategy (assuming 10-year debt issuance and a 5-year regulatory period) the cost of debt would be given by:
- a. The 5-year swap rate in an averaging period close to the beginning of the regulatory period;
 - b. The trailing average of 10-year debt risk premiums (measured relative to the 10-year swap rate); plus

- c. Portfolio transaction costs.
94. My answers to questions A and B establish that the hybrid debt management strategy is the efficient response to the QCA's application to Aurizon of the on-the-day compensation regime for the cost of debt.
95. It is, therefore, open to the QCA to adopt the hybrid debt management strategy as the regulatory benchmark without any transition. This would be an improvement on the on-the-day regime because it would be more closely replicable by the regulated business. Applying the principles set out in section 5.1:
- a. The hybrid debt management strategy is replicable and is based on the observed practice of regulated businesses subject to on-the-day regulation. The hybrid debt management strategy allows the regulated business to manage refinance risk by maintaining a staggered debt portfolio of long-term debt issuance. It also achieves a lower cost of debt on average than the on-the-day or the trailing average approach by virtue of only compensating for a 5-year base rate instead of a 10-year base rate.¹⁶
 - b. Adopting the hybrid strategy as the regulatory benchmark would be a change in the regulatory benchmark from the on-the-day approach. However, this change in the regulatory benchmark would be to better match the existing efficient debt management strategy under the on-the-day regime. Therefore, no transition would be required.
 - c. Under the hybrid method the cost of debt would be estimated as set out in paragraph 93 above.
96. The lower expected compensation under the hybrid debt benchmark can be illustrated by comparing a long time series of the difference between 5 and 10-year risk free rates. Under all three regulatory benchmarks considered (hybrid, trailing average and on-the-day) the assumption is that 10-year debt is issued. Consequently, all three benchmarks will, in expectation, have the same average DRP (being the DRP on 10-year debt). However, under the on-the-day and the trailing average approach the base rate of interest will also be the 10-year base rate. This differs to the hybrid where the base rate of interest is the 5-year base rate (floating rates swapped into 5-year fixed rates).
97. Figure 7 provides a time series of the 10-year risk-free rate less the 5-year risk free rate from 1972 onwards (the longest period over which the RBA publishes 5-year rates). As discussed previously, this is a longer time series than is available for swap

¹⁶ The yield curve is typically upward sloping such that the 10-year yield is higher than the 5-year yield.

rates but the difference between 5 and 10 government bond rates will closely approximate the difference between 5 and 10-year swap rates.¹⁷

Figure 7: 5-year rates are typically lower than 10-year rates



Based on historical interest rate data from 1969 onwards as published by the RBA in publication “F2 Capital Market Yields - Government Bonds”.

98. Based on the historical average relationship, the hybrid debt management strategy would result in a lower cost of debt by around 25 bppa. Since January 1995 this difference has been 32 bppa. Arguably, the latter period is more relevant to future market conditions as this covers the period of explicit inflation targeting by the RBA. (I note that if the QCA continued to maintain a 4-year regulatory period then the difference to the 10-year base rate would be even larger.)
99. My answers to questions E and F will also describe other material implementation advantages of the hybrid methodology. Specifically, this method avoids the need to weight periods in the trailing average based on RAB growth in the relevant year. This substantially improves:
- The simplicity of implementation relative to a weighted trailing average; and
 - The replicability (exposure to regulatory mismatch risk) relative to an unweighted trailing average cost of debt.

¹⁷ This is because, on any given day, the spread between 5-year swap and 5-year government bond rates will be similar to the spread between 10-year swap and 5-year government bond rates (and any difference will also be relatively stable overtime).

5.2.1 Regulatory precedent for adoption of the hybrid approach

100. The Western Australian Economic Regulation Authority (WA ERA) and the New Zealand Commerce Commission (NZCC) have both adopted the hybrid strategy as the regulatory benchmark for estimating the cost of debt. The WA ERA first adopted this approach in 2015 decision for ATCO gas where it concluded.¹⁸

the hybrid trailing average approaches clearly perform better in terms of 'minimising differences' and the present value condition. The simple hybrid trailing average approach also performs best with regard to regulatory costs.

101. The NZCC also adopted the hybrid benchmark on the same grounds.¹⁹

Our view is the interest rate associated with the majority of a firm's issued debt can be hedged using the swap market and we provide a reasonable allowance for the cost of that hedging. The evidence continues to suggest to us that the use of the prevailing rate provides better incentives for efficient investment, and the existence of the interest rate swap market means there is a low likelihood of a significant mismatch between the allowed risk-free rate provided for in the WACC and the interest costs paid by suppliers.

...

We previously considered that the potential for material mismatches (in regard to the debt premium) was minimal due to the relatively stability of the debt premium (particularly compared to the risk-free rate). However, we have now been persuaded that there is a benefit in moving to a historical averaging approach.

...

Given the above, we have changed our approach to estimating the debt premium compared to the draft decision. We now consider that, on balance it is more appropriate to provide a historical average of the debt premium, rather than retaining the prevailing approach proposed in the draft decision.

102. Both the WA ERA and the NZCC cite the superior investment incentive properties of the hybrid approach as a reason to prefer it to the trailing average cost of debt. I discuss this further in my answers to questions E and F below.

¹⁸ ERA, Final Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution Systems, pp.86-87.

¹⁹ NZCC, Input methodologies review decisions, Topic paper 4: Cost of capital issues, 20 December 2016, pp. 27, 35, 38

5.3 A replicable and efficient transition to a trailing average

103. The hybrid debt management strategy is the efficient response to the on-the-day regime. This strategy, once entered, cannot be instantaneously unwound. For an efficient business to move from the hybrid to a trailing average debt management strategy it would need to undertake a specific set of steps.
104. If a business has been employing the hybrid debt management strategy in the past, then the fixed rate swaps that it entered in to in the previous access arrangement period will expire at the end of that period leaving the business with a fully floating base rate exposure. The relevant transition must therefore reflect how a benchmark efficient entity with base interest costs that are completely floating at the beginning of the regulatory period would transition to a trailing average exposure. The simplest way to do so would be to set an allowance based on an assumed strategy of entering into 10 different fixed rate swap contracts:
- 10% of the overall portfolio value fixed at one-year maturity;
 - 10% fixed at two-year maturity;
 - and 10% of the portfolio fixed at each of 3 to 9 years maturity; 10% at 10-year maturity (or equivalently, just issue 10-year fixed rate debt (which has embedded in it the 10-year swap rate)).
105. Entering into these swap contracts, one for each year maturity, results in the maturity profile of the entity's swap exposure being aligned with the maturity profile of the entity's DRP exposure, given the assumption that the business has followed the hybrid debt management strategy in the past.
106. Having done this the firm would have effectively created a synthetic trailing average cost of debt that is equal to the average of:
- The DRP on 10-year debt (measured relative to 10-year swap rates) from 9 years ago plus the one-year swap rate today.
 - The DRP on 10-year debt from 8 years ago plus the 2-year swap rate today;
 - The DRPP on 10-year debt from 7 (6, 5, 4, 3, 2) years ago plus the 2 (3, 4, 5, 6, 7, 8) year swap rate today;
 - The DRP on 10-year debt from the most recent year (year "zero") plus the 10-year swap rate today (or, equivalently, the 10-year fixed rate today).
107. This portfolio approach could then be rolled forward in precisely the same way that a trailing average return on debt would – dropping the debt instruments from the earliest year of the trailing average because those debt instruments are maturing soonest and replacing the earlier debt with the costs associated with issuing debt in the most recent year.

108. Following this strategy, the appropriate compensation for a regulated business during the transition would be a blend of the synthetic historical trailing average and the post transition cost of debt. Specifically:
- Year 1: 100% weight to the 10-year synthetic trailing average;
 - Year 2: 90% weight to the 9-year synthetic trailing average²⁰ and an 10% weight to the cost of debt in the first year of the transition;
 - Year 3: 80% weight to the 8-year synthetic trailing average²¹ and an 20% weight to the cost of debt in the first two years of the transition;
 - Year 4: 70% weight to the 7-year synthetic trailing average²² and an 30% weight to the cost of debt in the first two years of the transition;
 - ...
 - Year 10: 10% weight to the 1-year synthetic trailing average²³ and an 90% weight to the cost of debt in the first 9 years of the transition.
109. Beyond this date the simple trailing average would be applied.
110. The AER imposed a transition different to the above. However, the AER transition did have similar properties in allowing the base rate of interest to be hedged (albeit at a rate lower than the AER compensated). The AER's approach can be thought of as identical to the above approach except:
- Instead of compensating the business for entering into a series of 1 to 10-year swaps the AER compensated them 'as if' all swap contracts were at 10-years (this overcompensated businesses by an amount dependent on the upward slope of the yield curve at the time of their transition); and
 - Instead of compensating the business for historical average DRPs on its existing portfolio at the time of transition the AER compensated 'as if' the historical average DRP was the same as the prevailing DRP on the date the transition began. This may have over or under compensated businesses depending on the circumstances.
111. In its report for the AER, Chairmont found that the transition from the hybrid to the trailing average cost of debt in the way we have described in this section best reflects

²⁰ Dropping the 1-year swap rate and the DRP from 10-years ago from the synthetic trailing average.

²¹ Dropping the 1- and 2-year swap rates and the DRPs from 9 and 10-years ago from the synthetic trailing average.

²² Dropping the 1-, 2- and 3-year swap rates and the DRPs from 8, 9 and 10-years ago from the synthetic trailing average.

²³ Retaining only the 10-year swap rates and the DRP from the very beginning of the transition the synthetic trailing average.

the cost of debt faced by a benchmark efficient entity funding itself using the hybrid debt management strategy and the AER's transition did not.²⁴

AER's transitional arrangements do not reflect the required transactions for the BEE to transition its portfolio to the 'trailing average'. This is a structural problem with both the base rate and DRP, as follows:

While a transition path for the base rate is required, the current measurement does not reflect the required transactions. It is currently measure using a 10-year term whereas NSPs can transition their portfolio using a series of 1-10-year swaps with maturities to coincide with the annual partial allowance resets. The average interest rate for a portfolio of 1 to 10-year swaps is usually a lower rate, including in 2014; and

The DRP does not need to be transitioned because the NSWSP already has a staggered floating rate debt portfolio. In treating DRP differently from the base rate it needs to be measured in relation to the swap curve, not the Commonwealth Government Securities (CGS) curve.

112. I agree with Chairmont's analysis. One possible explanation of the AER's approach was that, for whatever reason, it did not wish to use any historical data at the time its decision was made (when historical DRPs were known to be higher than prevailing DRPs). This may also explain why the AER was willing to overcompensate regulated businesses on the base rate during the transition.
113. In any event, while the AER transition is inferior to the transition proposed by Chairmont and me, it is clearly superior to a move to a trailing average without transition. This is because businesses can effectively hedge their floating rate exposure to the base rate in the AER transition using the swap strategy identified by Chairmont and myself.

5.4 Advanced warning of no transition does not reduce regulatory mismatch risk

114. It may be thought that the fact that the QCA is signalling in advance that a trailing average will be implemented without a transition in 2028 will allow Aurizon to adjust its debt portfolio gradually to align to the trailing average in 2028. However, this is not correct.
115. So long as Aurizon is regulated under the on-the-day regime prior to 2028 it will need to adopt the hybrid strategy to minimise regulatory mismatch risk in the earlier regulatory periods. If Aurizon began transitioning to a trailing average prior

²⁴

Chairmont, Cost of debt: Transitional analysis, April 2015, pp. 8-9.



to 2028 it would simply be incurring regulatory mismatch risk earlier (not avoiding it).

116. In addition, to the extent that Aurizon will seek a negotiated settlement with its customers on the efficient debt management relevant to determining the cost of debt for the regulatory period commencing in 2027 adjusting debt management strategies prior to those negotiations may limit Aurizon's ability to implement alternate strategies that are more beneficial to Aurizon and its customers.

6 Question E: weighting the trailing average cost of debt/DRP

To what extent is weighting of the trailing average cost of debt (or DRP under the hybrid approach) appropriate? In answering this question, please consider the possibility that Aurizon’s regulatory asset base may not be stable in the future (e.g., be materially declining in the future due to accelerated depreciation and may, or may not, experience large increases in the event that discrete capacity expansions are undertaken) and that the QCA’s estimate of the benchmark efficient gearing may also change.

117. Weighting the trailing average cost of debt is important for firms that might experience large variations in their regulatory asset base (RAB) or changes in benchmark gearing over time. This is for two reasons:
- a. First, weighting the trailing average based on the amount of debt that must be raised in a period results in a more replicable cost of debt allowance and, therefore, reduces the regulated business’s exposure to regulatory mismatch risk; and
 - b. Second, weighting the trailing average promotes efficient investment incentives.
118. Of course, for a regulated business that is projected to have a relatively stable RAB over time (such as an electricity or water distribution business) these considerations may be less important and, therefore, the added complexity of implementing a weighted trailing average may not be justified. However, for businesses that have, or are likely to have, volatile debt raising requirements the above considerations can be important.
119. In this context, I note that the AER has, until now, applied an unweighted trailing average approach. However, there are large upcoming investment programs in electricity transmission (most notably the \$2.3bn “EnergyConnect” project connecting NSW and South Australia). In this context, the AER is reconsidering its unweighted trailing average approach. The AER correctly states:²⁵

For a new capex program, using a simple trailing average implies that the capex program can be financed with historical debt. However, new investment can only be financed with forward looking debt. If the prevailing return on debt is lower (higher) than the historical 10-year average return on debt, this new capex program will result in a positive (negative) NPV outcome if the return on debt is estimated using the simple trailing average.

²⁵ AER, Rate of Return, Draft Debt Omnibus Paper July 2021, p. 3-23

120. This will mean that firms have an incentive not to invest when the prevailing cost of debt is above the trailing average cost of debt (when an investment has negative NPV). The ERA makes the same point:²⁶

Under a simple trailing average, the marginal return on debt applying to a new investment is not the prevailing rate, but rather the trailing average estimate of the return on debt that is incorporated in tariffs.

So for example, if a firm increases the size of its regulatory asset base by 5 per cent in any year, then it will receive the regulated rate of return on that investment for the year in which it is expected to enter the asset base, and for subsequent years. That rate of return will incorporate the trailing average. Hence the return to that investment will be based on the trailing average; it will not be the prevailing rate.

It makes no difference whether the new investment, as a proportion of the asset base, is greater or lesser than the proportion of debt annually updated in the trailing average.

Therefore, to the extent that the prevailing rate exceeds the trailing average cost of debt allowance incorporated in the tariff that applies to a new investment, then there will be an incentive to delay the forecast investment, so as to avoid making a loss on that investment. This is a clear distortion in investment incentives.

121. If investments are primarily driven by maintaining service levels (avoiding the lights going out or keeping the drinking water safe) then it is likely that these investments will continue to be made in any event. However, when these investments are driven by expansions to service (such a new interstate electricity lines of development of new railroad services) then such incentive effects may be material.
122. The on-the-day and the hybrid approach are less affected by this because, by their nature, debt compensation is based on the prevailing conditions at the start of the regulatory period (for the full cost of debt for the on-the-day approach and for the base rate of interest for the hybrid approach). It is true that the hybrid approach has a trailing average component for the DRP. However, the base rate is the most volatile component of the cost of debt and, therefore, it is the component that is most important to set on a prevailing basis in order to promote efficient investment incentives.

²⁶ ERA, Final Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution Systems, p.302.

123. This was the NZCC's reasoning for preferring the hybrid benchmark over the trailing average method benchmark.²⁷

The risk-free rate has been lower than its historical average over the last five years, although it remains volatile. This means some of the problems with a trailing average have been less apparent. In an alternative environment of increasing interest rates, we consider that it is likely to be harder for firms to invest without an allowance consistent with the prevailing risk-free rate. If a trailing average was in place under such circumstances, we would expect suppliers to ask for an allowance more consistent with the prevailing market rate for capital and it would be difficult for us to refuse such a request.

...

The evidence continues to suggest to us that the use of the prevailing rate provides better incentives for efficient investment, and the existence of the interest rate swap market means there is a low likelihood of a significant mismatch between the allowed risk-free rate provided for in the WACC and the interest costs paid by suppliers.

124. Given the investment incentive problems associated with an unweighted trailing average (as set out by the ERA the NZCC, and potentially now being adopted by the AER) I consider that either:
- a. The hybrid benchmark be applied to Aurizon from 2028; or
 - b. The QCA implement a transition to a weighted trailing average from 2028.
125. The hybrid approach could be implemented with or without weighting of the historical DRP. This is because, the incentive problems are largely addressed using a prevailing base rate at the beginning of the regulatory period. In this regard, my position is consistent with the NZCC. However, I note that the WA ERA does also weight the trailing average DRP component of the hybrid.
126. If the hybrid benchmark is not adopted, then I consider that it is important to adopt a weighted trailing average for Aurizon. This is based on dual considerations that may not apply equally to other businesses regulated by the QCA. Specifically:
- a. That there is scope for Aurizon's RAB to be volatile for the reasons put to me in Question E and these reasons may not apply with the same force to other businesses regulated by the QCA; and
 - b. That Aurizon faces potentially material future discretionary investment decisions (decisions to both expand or, in the face of declining demand,

²⁷ NZCC, Input methodologies review decisions, Topic paper 4: Cost of capital issues, 20 December 2016, pp.26-27

contract the geographical areas served). This may be different to other businesses that the QCA regulates (such as regulated water and port businesses).

127. In this context the regulatory mismatch problems and the incentive problems with an unweighted trailing average may be materially higher for Aurizon than other regulated businesses.
128. These concerns may be exacerbated if, as is plausible, future climate change policies (domestically in Australia or internationally) and/or technological changes begin to make Aurizon’s services to some customers commercially marginal post 2028. In this scenario, Aurizon may well assess that its ability to recover its RAB from (the ultimate mining) customers in the long run is uncertain. In this context, Aurizon may already have disincentives to make new investments – even in maintaining quality of service. If an unweighted trailing average is materially lower than prevailing interest rates this would exacerbate those incentives. (This will be the case if interest rates rise from their current historically low levels back towards historical average levels.) To put it simply, if there is doubt about the long-term relationship with customers short term disincentives to serve those same customers can be powerful.
129. It is also the case that uncertainty about the long-term demand for coal may well lead to accelerated depreciation of Aurizon’s RAB in the near future. The AER has recently agreed to accelerate the depreciation of EvoEnergy’s RAB because the ACT Government has announced climate change policy that will limit future gas usage.²⁸ Similar policies are being considered by the New Zealand Government and the NZCC is considering both accelerated depreciation and a WACC uplift now for stranding risk.²⁹

Due to the transition to a net zero emissions economy, there is an increased risk of the gas pipeline networks becoming economically stranded. This means there is a risk that GPBs may be unable to, at some point in the future, fully recover their historic capital investment as customers disconnect from GPB networks.

...

Measures that mitigate asset stranding risk by bringing forward cash flows are (in principle) NPV-neutral to suppliers and consumers, as long as economic network stranding does not occur. In the 2016 IM review we

²⁸ AER, Final Decision Evoenergy Access Arrangement 2021 to 2026 Attachment 4 Regulatory depreciation, pp.7-10.

²⁹ NZCC, Resetting default price-quality paths for gas pipeline businesses from 1 October 2022 Process and Issues paper, 4 August 2021, pp. 76, 79-82

introduced such a mechanism to allow shortening of asset lives for EDBs to mitigate economic stranding risk due to technological change.

*Mitigation measures alone may be insufficient to ensure suppliers have an expectation of FCM. If so, ex-ante compensation may be appropriate. Ex-ante compensation mechanisms provide consumers with insurance against future price shocks, while **explicitly exposing suppliers to the risk that assets may be economically stranded in the future**. We have previously provided ex-ante compensation for stranding risk for regulated fibre services.” [Emphasis added]*

130. I am currently advising both the Australian Gas Pipeline Association (AGPA) and Vector (the largest New Zealand gas pipeline business) on the modelling and implementation of accelerated depreciation to avoid/limit asset stranding risk. It is at least plausible that a similar consideration may apply to Aurizon in the future.
131. If so, weighting of the trailing average may be very important. In some modelling scenarios, accelerated depreciation may mean that there is zero net borrowing requirement each year. This will occur if return of capital is sufficient to fund both new capex (which would likely be limited in this circumstance) and the refinancing of new debt falling due. In this situation, an unweighted trailing average may bear little relationship to the true weights in the regulated business’s debt portfolio.

7 Question F: Relative merits of a hybrid vs trailing average regulatory benchmark

Please explain the relative advantages and disadvantages of the QCA draft report approach and the alternative approaches you have identified in your answer to question D? Please identify which of these approaches is most desirable in relation to:

- a. *Most accurately compensating for the efficient funding costs of a benchmark efficient firm in the same operating environment as Aurizon's network business;*
- b. *Minimising the expected level of efficient funding costs incurred by a benchmark efficient firm in the same operating environment as Aurizon (and, therefore, minimising the amount paid by Aurizon's customers);*
- c. *Minimising the complexity, and maximising the flexibility, of the regulatory regime to changing future circumstances (including instability in Aurizon's regulatory asset base).*

132. Consistent with my answers to earlier questions, I consider that the hybrid benchmark has the following advantages over the simple trailing average cost benchmark for setting the cost of debt for Aurizon:

- a. The hybrid benchmark does not require a transition because it is consistent with the currently efficient debt management strategy;
- b. The hybrid benchmark will have lower expected costs than the trailing average due to the use of a shorter term for the base rate than 10-years;
- c. Due to its greater reliance on prevailing market interest rate, the hybrid benchmark:
 - i. does not have the incentive problems associated the unweighted trailing average;
 - ii. can avoid the complexity associated with a weighted trailing average;
 - iii. is more easily replicable than the unweighted trailing average and, therefore, has lower regulatory mismatch risk;
 - iv. is more able to flexibly deal with material changes in the Aurizon's RAB over time; and
 - v. generally, preserves greater flexibility for any future changes in the benchmark debt management strategy (noting that it takes 10-years to transition into or out of a 10-year trailing average).

133. Consistent with my answer to Question C, the hybrid and/or a transition to the trailing average both have a further critical material advantage over the adoption of a trailing average *without transition*. The latter approach would expose to Aurizon

to untenable regulatory mismatch risk and, ultimately, an untenably high exposure to insolvency risk. This would impose significant expected costs and inefficiencies associated with potential financial distress and should not be contemplated by the QCA.

134. I also note that Aurizon's next regulatory reset with the QCA at which a trailing average would be implemented is in 2028. This exposes Aurizon to greater uncertainty about prevailing interest rates at that time than for other QCA regulated businesses and, therefore, greater regulatory mismatch risk. This distinguishes Aurizon from those other businesses regulated by the QCA.

135. I do not consider that there are any significant disadvantages associated with the hybrid method relative to the trailing average method.

136. The QCA does express the following reason for not adopting the hybrid method.

In response to the DBCT User Group, while we note that the hybrid strategy is one possible strategy, we consider that it is an artefact of the regulatory process—in particular, it is a product of a regulatory reset in combination with an on-the-day cost of debt. Under these conditions, some firms implement the hybrid strategy in response to the periodic resetting of rates. As such, it is not a strategy adopted by unregulated firms in competitive markets, as these markets have no regulatory resets.

137. The last sentence of this statement is, in my view, correct. However, I also consider that this is not a relevant consideration for the QCA. Regulated businesses are not, by definition, operating in a competitive market. Regulated businesses will, in order to manage regulatory mismatch risk, always respond to the regulatory benchmark – be that the hybrid, the on-the-day or a trailing average cost of debt. The fact of regulation materially changes the operating environment for a regulated business and affects the most efficient debt management strategy.

138. The QCA has previously expressed the same view:³⁰

However, the QCA does not consider that the regulator should attempt to 'match' the regulated firm to an unregulated, competitive firm in all respects, to the extent that the two firms are different. Regulated firms, by definition, are subject to regulation, which implies that they face circumstances that differ from circumstances that unregulated firms in competitive markets face. For example, regulated firms face periodic resets of their allowed revenues, while unregulated firms do not. There are a range of models applied to regulated firms; these models include revenue caps and price caps, for example. These models also contain other

³⁰ Aurizon Network's 2017 draft access undertaking, December 2018, Appendix F: Assessment of individual WACC parameters, p.36

mechanisms, like cost pass-throughs, which affect the risk and, in turn, the cost of capital of the regulated firm. This is not the case for unregulated firms in competitive markets.

139. In my view, and consistent with the QCA views expressed above, the QCA should choose a debt management benchmark that is most efficient for regulated businesses. For the reasons set out in this report, I consider that this is the hybrid debt management strategy.
140. If the QCA's objective were to set a debt management strategy based on the practices of firms operating in competitive markets it would likely set a much lower leverage. For example, Aurizon's ultimate customers are large infrastructure owners in competitive markets. If the QCA used these firms to determine the benchmark debt management strategy it would set the debt leverage much lower (both Rio Tinto and BHP have debt leverage below 20%) and would likely adopt a longer tenor than 10-years. In my view, the QCA should not adopt such an approach precisely because debt management strategies of firms operating in competitive markets are less relevant (not more relevant) to what is an efficient debt management strategy for a regulated business.

8 Question G: Sole reliance on RBA

Please advise whether the QCA's proposal to, when setting the cost of debt, rely solely on estimates of 10-year BBB+ corporate bond yields as published by the RBA is good regulatory practice?

141. The QCA proposes to have sole reliance on RBA estimates of the cost of debt to inform the costs of implementing the benchmark efficient strategy.
142. Other things equal, it is good statistical, and therefore regulatory, practice to have regard to all of the available evidence. This is as true when estimating the regulated allowance for operating expenditures as it is when estimating regulated allowance for the cost of debt. The primary constraint on having regard to all the available evidence is the cost in terms of the regulator's (or stakeholders') time and resources in investigating that data and/or purchasing it from third party providers
143. Nonetheless, the use of a single source for the estimate of the benchmark cost of debt may be appropriate if:
 - a. there is one source that is clearly more accurate than other sources; or
 - b. it is materially more expensive (in terms of internal QCA resources, external purchase cost and/or stakeholder resources) to have regard to multiple data sources.
144. The QCA appears to have chosen to adopt the RBA methodology primarily on the basis that it is publicly available and, therefore, is inexpensive for stakeholders to replicate.³¹

Our preference is to solely reference RBA data series for estimating the cost of debt in the future. The RBA is an independent and reputable provider of data series and uses transparent and robust methodologies to develop its data series. Further, the RBA's data series are readily available, unlike those prepared by the other third parties, which are currently available only with a paid subscription to these services. Adopting these sources would make it more expensive for stakeholders to replicate our method.

145. I agree that the freely published nature of the RBA series makes it low cost for stakeholders to replicate the QCA's estimate. However, the benefits of low costs to stakeholder, such as they are, must be weighed against the costs of potentially having less accurate and less reliable cost of debt estimates. In my view, the latter costs outweigh the former.

³¹ QCA, Draft report, rate of return review, June 2021, p.31.

146. Firstly, the RBA data is less reliable as source of market conditions in any given debt averaging period because it is only estimated on one day every month. This is important because, as the QCA itself explains:³²

This short multi-day averaging period helps to mitigate the effect of single-day aberrations in rates, while determining a cost of debt that is relatively 'current', and therefore consistent with the on-the-day approach.

147. If such an aberration happens to occur on the single day that the RBA estimates its cost of debt for that month, then this will strongly affect the cost of debt for the whole averaging period that falls within that month (or the month before).
148. Secondly, the RBA method is a weighted average of individual bond spread to swaps where those bonds closest to the target tenor are given more weight (according to a Gaussian kernel centred on the target maturity).³³ This method works well where there are a reasonable number of bonds close to the target tenor. However, this has not always been the case in the past for the 10-year tenor for BBB bonds (and cannot always be assumed to be the case in the future). Specifically, if there is a single bond with a tenor very close to 10-years and no other bonds close to 10-years tenor (e.g., all being less than 8 years or more than 12 years) then that single 10-year bond will receive a very high weight in the RBA estimate. This feature can lead to anomalous results.
149. Thirdly, the RBA series is mechanically determined based on Bloomberg BVAL yields for individual bonds (subject to deterministic criteria for bond inclusion). By contrast, the Bloomberg BVAL 10-year BBB+ bond estimate involves an element of judgment by Bloomberg professionals. For example, Bloomberg professionals have, in the past, excluded Coca-Cola Amatil bonds with BBB+ credit ratings from its estimate of the BBB curve given that these bonds were not trading at yields consistent with a BBB+ credit rating. The RBA continued to use these bonds in its BBB curve construction after they were excluded by Bloomberg. Incenta (2018) advised the QCA that Bloomberg's policy was superior to that of the RBA, and it also excluded the Coca Cola bonds when estimating Aurizon's DRP for the QCA.³⁴
150. Finally, even if the RBA curve did not have these potential problems and there was no difference in accuracy between it and the Bloomberg or Thompson Reuters curves there would be material advantages in using an average simply because the inevitable errors in one data provider's estimate of the benchmark cost of debt (relative to the true but unknowable cost) are likely to be uncorrelated (or not

³² QCA, Draft report, rate of return review, June 2021, p.26.

³³ RBA Bulletin, New Measures of Australian Corporate Credit Spreads Ivailo Arsov, Matthew Brooks and Mitch Kosev, Bulletin – December Quarter 2013.

³⁴ Addressing responses to Incenta's debt risk premium estimate for the 2017 draft access undertaking Queensland Competition Authority June 2018 p.3

perfectly correlated). This means that an average will be more accurate than any single estimate.

151. In this regard I note the AER published the below time series for its derived cost of debt from the three data sources (RBA, Bloomberg and Thompson Reuters).

Figure 8: AER time series for debt costs from three data providers



152. Divergences between these curves can be highly material and the RBA curve often swings from being the highest to the lowest of the curves (which is consistent with the observations I have made above).
153. Against these concerns associated with sole reliance on the RBA we must balance the benefit of doing so as determined by the QCA. Namely, the lower cost for stakeholders in replicating the QCA methodology. In my view this benefit does not outweigh the costs identified above. In this regard I note that:
- It is not obvious that small stakeholders (such as household consumers of regulated water services) will derive material utility from replicating the QCA methodology with or without sole reliance on the RBA series.
 - Major stakeholders (such as Aurizon and its direct (rail haulage) and indirect (mining) customers) will have no material difficulty in replicating the QCA method having regard to Bloomberg and/or Thompson Reuters data.
 - The QCA can report to stakeholders on the results of application of its method (just as the AER has done above) without those stakeholders having to purchase subscriptions to the relevant services.

9 Question H: Picking up ESG impacts on debt costs

Aurizon's network is an input into supplying coal haulage operations and, for some institutions, lending to a stand-alone rail manager of the CQCN would be in contravention of "environmental, social, and governance" (ESG) criteria that they have adopted. In your opinion, what implications might this have, either now or in the future, for:

- a. *The debt costs for a benchmark efficient business in Aurizon's operating environment; and*
- b. *The QCA's framework for estimating benchmark efficient debt costs.*

154. In my answers to previous questions, I have noted that Aurizon's position as a supplier to a carbon intensive industry places uncertainty around its future path of RAB recovery and that this fact suggests there would be benefits from applying a flexible benchmark debt management strategy for Aurizon (i.e., the hybrid strategy). I have noted that these issues are being identified and dealt with now in the regulated gas industry (including by the NZCC which is examining both accelerated depreciation and a WACC uplift in response to uncertain future gas demand).
155. Similar considerations will be relevant to the estimation of the cost of debt issued by a benchmark firm in Aurizon's operating environment. These costs may be raised above those for other similarly rated infrastructure providers who do not face the same operating environment. This could be caused by increased perceptions of stranding risks for Aurizon's assets.
156. However, even if this is not the case, if, on ESG grounds, the pool of lenders willing to lend to Aurizon shrinks materially then Aurizon may face a combination of:
 - a. higher transaction costs associated with educating a sufficiently large number of lenders about its business in order to create a competitive market in lenders;
 - b. higher credit spreads due to a smaller and less competitive market in lenders.
157. This reflects the fact that corporate debt markets require significant sunk research costs by lenders. This is especially true when the borrower has a complex business and/or uncertain future operating environment. Borrowers must invest materially in educating potential lenders about their business and lenders must be willing to invest in that education process.
158. There is the potential for greater uptake of ESG criteria to reduce the pool of lenders who are already educated about Aurizon's business and/or are willing to be. This could raise both Aurizon's transaction costs associated with raising debt and the price at which it is raised relative to other similarly rated businesses who do not face this constraint. This effect is above and beyond the increased complexity of that



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education process in a world where the uncertainty around the future of carbon intensive industries is increasing.

Appendix A The costs of financial distress

A.1 Finance theory

159. The cornerstone of modern finance theory on the optimal capital structure for a firm is the work of Modigliani and Miller (1958). The following three subsections summarise their results. The first describes the optimal capital structure in the hypothetical context of perfect (zero transaction costs) capital markets. The second describes optimal capital structure in the more realistic context of imperfect capital markets, where “frictions” exist. The third describes the special role of bankruptcy/insolvency costs in determining an optimal capital structure.

A.2 Modigliani-Miller with perfect financial markets

160. The principal insight of Modigliani and Miller (1958) is that the level of risk in a firm is rather like the amount of air in a balloon. Squeezing one end of a balloon does not reduce the amount of air that is inside – it just shifts it to “the other end”. In much the same way, issuing debt does not reduce the overall level of risk – it simply shifts it somewhere else – in this case, to equity. Miller (1991) made a similar observation some 30 years later:

Think of the firm as a gigantic tub of whole milk. The farmer can sell the whole milk as it is. Or he can separate out the cream and sell it at a considerably higher price than the whole milk would bring. (Selling cream is the analog of a firm selling debt securities, which pay a contractual return.) But, of course, what the farmer would have left would be skim milk, with low butter-fat content, and that would sell for much less than whole milk. (Skim milk corresponds to the levered equity.) The Modigliani-Miller proposition says that if there were no cost of separation (and, of course, no government dairy support program), the cream plus the skim milk would bring the same price as the whole milk.

161. In this quote Miller notes that issuing low risk debt securities is analogous to a farmer separating out cream from whole milk; namely:
- the firm gets a good price (low interest rate) for its debt; but
 - the corollary is that the remaining equity is less desirable, and so requires a higher return to attract investors.
162. What Modigliani and Miller demonstrated is that if financial markets are efficient and there are no transaction costs, any reduction in the cost of debt will be perfectly

offset by a higher cost of equity. A firm's capital structure therefore has no effect on its weighted average cost of capital (WACC). This "law of the conservation of risk" is comparable to the "law of conservation of energy" from the physical sciences. Like energy, risk cannot be destroyed – it can only be converted from one form to another.

163. It should be noted that Modigliani and Miller do not define "transaction costs" as encompassing simply the direct and observable costs of an activity (such as payments to printers for a prospectus). Rather, transaction costs are defined much more broadly to include costs associated with dealing/trading in imperfect markets. These include, for example, costs associated with imperfect management incentives (agency problems and incentive problems with asymmetric information), and costs associated with trading in illiquid markets and/or with financial constraints that force a business to make suboptimal decisions.
164. A further conclusion that flows from Modigliani and Miller is that, if financial markets are perfectly efficient with zero transaction costs, then no particular debt raising strategy will dominate any other. Irrespective of whether a business issues large or small amounts of debt, short-term debt or very long-term debt, callable or puttable debt, etc., its WACC will be the same.

A.3 Modigliani-Miller financial markets with frictions

165. Given the finding that, in frictionless financial markets, a business's capital structure simply does not matter then, if capital markets were frictionless, one would expect that firms with very similar attributes (products, competitors, cost structures and so on) would exhibit a great variety of capital structures. For example, some may have short term debt, others long term debt; some may have high gearing and others low gearing, and so on. There would be no 'common' strategy because, in the absence of frictions, there is no advantage from adopting any particular practice.
166. In actuality, businesses with similar attributes will often consistently adopt the same (or similar) debt raising strategies. The insight of Modigliani Miller is that consistently observed debt management strategies must be explained by a desire to minimise transaction costs (broadly defined) associated with less than perfect markets. That is, once one relaxes the assumption that capital markets are efficient, theory suggests that businesses (or subsets of businesses) will often adopt debt raising strategies that are designed to minimise exposure to those imperfections with a view to reducing transaction costs. Common strategies may therefore start to emerge.
167. A straightforward example is that businesses rarely, if ever, issue public debt at levels below a certain threshold, typically measured in the millions of dollars. This is because there are transaction costs associated with selling debt on both the seller

(prospectus/legal fees etc.) and buyer side (becoming informed about the quality of the debt etc.). For this reason, businesses will typically seek to avoid repeatedly incurring the same transaction costs by undertaking a smaller number of large debt issues (as opposed to a large number of small issues).

A.4 Special role of insolvency/bankruptcy costs

168. Once the Modigliani-Miller result was understood finance academics immediately attempted to explain, within the paradigm of transaction costs, businesses attempt to limit the volatility of cash flows by, for example, attempting to hedge their costs to their revenues – including by limiting the amount of debt finance used (because interest must be paid irrespective of revenues)? This question was especially pertinent given that the existence of tax as a transaction cost and the tax deductibility of interest costs would tend to suggest that 99.99% gearing would minimise tax costs (and therefore transaction costs).
169. The generally accepted answer was that there were very high levels of transaction costs associated with insolvency/bankruptcy and this was why firms tended not to adopt high levels of gearing. Baxter (1967)³⁵ was one of the first to make this point but many authors have built on his insight since.³⁶

The purpose of the present paper is to explain, in the context of the Modigliani and Miller discussion, how excessive leverage can be expected to raise the cost of capital to the firm. It is argued that when account is taken of the “risk of ruin” a rising average cost of capital is perfectly consistent with rational arbitrage operations. Allowing for the possibility of bankruptcy is tantamount to relaxing the assumption that the anticipated stream of operating earnings is independent of the capital structure. [Baxter (1967)]

170. Insolvency or near insolvency imposes costs on a range of parties, including:
- Debt investors: insolvency means that debt holders do not get paid when debts fall due (a technical default). Debt investors will typically incur significant costs to manage that disruption (such as curtailing consumption/investment in other activities or borrowing from third parties – often at penalty rates due to the financial distress of the original technical default). If they cannot manage the

³⁵ Baxter, N., "Leverage, Risk of Ruin and the Cost of Capital," *Journal of Finance* 22, September 1967, pp. 3956-403.

³⁶ For example: Stiglitz, J.E., "A Re-Examination of the Modigliani-Miller Theorem," *American Economic Review* 59, December 1972, pp. 784-793; Kraus, A. and R.H. Litzenberger, "A State Preference Model of Optimal Financial Leverage," *Journal of Finance*, September 1973, pp. 911-922; and Kim, E.H., "A Mean-Variance Theory of Optimal Capital Structure and Corporate Debt Capacity," *Journal of Finance* 33, March 1978, pp. 45-63.

technical default, then they will themselves be rendered insolvent (unable to pay their debts as they fall due);

- b. Equity investors: insolvency (or near insolvency) means that equity investors must stop receiving a dividend on their investment, which they have to manage in the same manner as debt investors and with analogous consequences. Equity investors will also suffer because the businesses reputation as a reliable borrower will be damaged. Moreover, existing equity investors may be forced to participate in a rights issue and/or a public equity raising to address the insolvency. Both of these options are likely to involve substantial transaction costs for equity investors.
171. Depending on the nature of the contracts with debt holders, insolvency may also give rise to debt holders taking full or partial control of the company and, potentially, to bankruptcy proceedings. Protracted legal battles may ensue between debt and equity holders (and between different groups of debt/equity holders) over the future of the firm. This may paralyse management, with the principal focus being on the division of the existing value of the firm (and debt holders attempting to ensure the maximum repayment of their debts) rather than on maximising the total value of the firm (including the equity stake).
172. These costs can destroy the value of a firm that would, had it adopted a less aggressive capital management strategy, never have become insolvent in the first place. Moreover, the disastrous nature of the potential transaction costs associated with insolvency (and bankruptcy), can see a firm in moderate financial distress quickly spiral into insolvency. This is because debt investors may be unwilling to fund the firm (or only at penalty interest rates) for fear of subsequent exposure to these costs. In other words, if there is perceived to be the potential for insolvency, this can become a self-fulfilling prophecy.
173. It is for these reasons that transaction costs associated with insolvency/bankruptcy play a key role in the ‘real world’ analysis of optimal capital management plans. Any change to capital management strategy can materially influence the likelihood (or perceived likelihood) of insolvency/bankruptcy, and so the probability of these substantial costs being incurred. It is important to recognise that there does not need to be an imminent threat of insolvency or bankruptcy for these factors to have a material bearing upon a firm’s optimal capital management strategy. What matters is the potential effect of a particular strategy on expectations.
174. The “catch-all phrase” for this downside from gearing in the economic literature is the “costs of financial distress” (CFD). These costs come in many forms, including:
 - a. being forced to raise capital at disadvantageous rates in the future;
 - b. having to sell assets at “fire-sale” prices;
 - c. distortions to operational decisions that result from operating in financial distress; and,

- d. ultimately, the direct costs of litigation between stakeholders triggered by insolvency/bankruptcy.

- 175. These costs are significant. In a separate report prepared on behalf of Orion,³⁷ CEG Academic Consultant Professor Bruce Grundy has reviewed the literature on the CFD and is able to provide a reasonably tight bound for the expected CFD – including utility specific estimates.
- 176. Specifically, by relying on empirical estimates of the CFD in the finance literature, Professor Grundy estimates a range for the actuarially expected CFD of between 5% and 8.8% of firm value – with the upper end of that range being a utility specific estimate.
- 177. This implies that the present value of all expected future costs of financial distress amount to 5% or more of the RAB for a regulated business. This is the expected costs based on the small probability that a firm will be in financial distress in any given future year. Naturally, the cost incurred if a business is actually in financial distress will be an order of magnitude higher.
- 178. Unhedgeable regulatory allowances raise the expected CFD because it increases the probability of future financial distress.

³⁷ Professor Bruce Grundy, *The Costs of Financial Distress and Allowed Revenues for Regulated Firms*, 28 April 2014. And Professor Bruce Grundy, *Observations on the Review of Submissions on the Cost of Debt and the TAMRP for UCLL and UBA Services* Bruce D. Grundy 17 July 2014