Rate of Return Instrument Review

Response to AER's Final Omnibus and Information papers

11 March 2022

Energy Networks Australia

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1 Overview

Energy Networks Australia welcomes the opportunity to provide a response to the AER's recent *Omnibus Final Working Paper* and the associated *Information Paper* released as part of the Pathway to the 2022 Rate of Return Instrument process.

The AER's preparation of the 2022 Rate of Return Instrument is occurring across a period of unprecedented global market conditions and associated volatility in capital markets. The AER has positively recognised the importance of its future Rate of Return Instrument being capable of delivering rate of return estimates that match the market return required by investors in the individual determinations through which it has applied.

The challenge of ensuring required future investments to support the transition

Reinforcing the challenge of this task is that the regulatory regime also needs to ensure clear investment signals for identified transmission projects, the ongoing integration of customer solar and storage into the grid, and required investments in gas distribution systems to support a once in a generation least-cost transition to a net zero energy system.

Investment in gas and electricity grids is also increasingly essential to ensure networks are resilient for their customers and communities, helping them to manage through and bounce back from increasing climate-change related natural disaster events like floods and bushfires.

Efficient network investment will help keep Australia's energy system secure and reliable and enable customers to connect more solar and storage devices like batteries and electricity vehicles to the grid, giving them greater control of their energy. By allowing for connection and grid capacity to support these innovations, the community can avoid more expensive options like building more network and more generation than necessary, helping keep bills lower.

Enabling the efficient financing of these diverse range of network investments required to support customer outcomes will be a key measure of performance for the new Rate of Return Instrument.

Determining choices and approaches that provide internationally comparable incentives

Currently, research commissioned by the AER has highlighted that across a range of critical metrics, the AER's equity allowances are below that in place across a wide set of internationally comparable regulatory regimes. In weighing the implementation options and estimation approaches to be used in the draft Instrument, a key question for consideration is the likely collective impact of these choices on this position, and the risks and costs of the AER providing equity allowances substantially below that of other developed country comparators.

Providing practical suggested approaches on outstanding issues

ENA recognises that the AER has identified several key outstanding issues in both its Omnibus and Information Papers on which it seeks further views.

This submission therefore focuses on a number of these issues, setting out ENA's detailed views and recommendations on both alternative approaches and estimation issues. In a number of key areas, this and prior network industry submissions have set out practical illustrative guidance on estimation approaches that could be applied by the AER. Examples of this include:

- Beta estimation in view of the increasing absence of relevant domestic comparators; and
- Incorporating greater forwarding looking evidence on market risk premium estimates through use of a 'calibrated' Dividend Growth Model

The 'bar for change' has not been met across the term of the risk-free rate and cost of debt

Across a range of key decision areas for the AER Board, energy network businesses are submitting that the 'bar for change' in approach has clearly not met. In these areas, ENA is supporting approaches consistently upheld by the AER across multiple similar reviews since the AER first assumed responsibilities for network regulation.

Examples of these areas include the retaining of the market standard of use of 10-year Commonwealth Government Securities in estimating the risk-free rate for cost of equity, the use of actual debt data as a cross-check on a benchmark 10 year trailing average cost of debt, and the inability of RAB multiple evidence to provide meaningful input into the estimation of the rate of return.

Each of these positions have been consistently held and reaffirmed by the AER across multiple decisions. They have in common the fact that no substantial new evidence or regulatory constructs have emerged to justify an overturning of past regulatory approaches. Broadly these approaches also apply as a common standard across a majority of Australian regulators.

Specifically in relation to recent market transactions and associated Independent Expert Reports, ENA has recently commissioned independent valuation advisory firm Grant Thornton to provide the AER and stakeholders with further advice on the common analytical frameworks and approaches used by experts and investors.

This attached report also provides an assessment of the comparability of the task of independent experts in market transactions and the regulatory task, and sets out the relevance to the AER's regulatory task of the direct cost of equity estimates presented in independent expert reports. Grant Thornton also present conclusions on the inherent barriers to the reliable 'decomposition' of RAB multiples for the purposes of meaningfully informing rate of return considerations.

Recommendations on key issues and summary for provision to the Independent Panel

This chapter sets out a summary of ENA's key messages and primary recommendations on each of the issues identified in the AER's recent Omnibus and Information Papers for further consideration through the next stage of the 2022 Rate of Return Instrument Review Process (RoRI) process.

Further chapters set out ENA perspectives on the key outstanding issues for AER consideration.

Chapter 13 of this submission provides a set of issues for particular focus by the Independent Panel. Consistent with past AER discussions, ENA understands that this will be provided to the Independent Panel, and that the Panel will have the full opportunity to access and review this submission.

ENA has also set out a range of high priority recommendations focused on the key design, estimation, methodology and approach choices facing the AER in the delivery of the draft Instrument. These are summarised in chapter 14.

1.1 The context of this review – return on equity

Key messages

- The AER's allowed return on equity is currently lower than at the time of any previous rate of return review.
- The Brattle report commissioned by the AER demonstrated that the AER's allowed return on equity was, by every metric, lower than that of all comparable regulators that were examined. Brattle concluded that the AER's approach was "*not as effective*" as that of other regulators.
- The independent expert valuation reports prepared as part of the recent Spark Infrastructure and AusNet Services transactions concluded that the current market cost of equity capital (with gearing at 60%) is 200 basis points higher than the AER's current allowance.
- Networks are being asked to invest very material amounts of new capital to support and enable the decarbonisation of the Australian economy. The AEMO draft ISP estimates that consumers will receive $2.50 of benefits for every dollar of new network investment.

1.2 Use of independent terms for forecast inflation and return on debt and equity

Primary recommendations

Recommendation 1: Separate term for inflation and allowed return on capital

There is no link between the efficient cost of capital in financial markets and the mechanics of the AER's treatment of regulatory inflation within the PTRM and RFM. Consequently, the terms for regulatory inflation and the allowed return on capital are independent.

Recommendation 2: Term for debt and equity should reflect what investors require

The allowed return on debt should reflect the term that debt investors use when determining the return they require.

Similarly, the allowed return on equity should reflect the term that equity investors use when determining the return they require.

1.3 The implications of NPV=0 for term issues

Key messages

- The NPV=0 principle requires that the regulatory allowance should match the return that is required by investors; no more and no less.
- The NPV=0 principle is supported by adopting the following approach:
  - For debt, the regulatory allowance should reflect the term that determines the return that debt investors require;
  - For equity, the regulatory allowance should reflect the term that determines the return that equity investors require; and

- For inflation, the regulatory figure should ensure that what is 'taken out' equals what is expected to be 'put back in.'

1.4 The term for the allowed return on debt

Key messages

- The NPV=0 principle is supported by identifying a prudent and efficient benchmark debt financing approach and then setting the regulatory allowance to reflect the cost of that benchmark approach.
- There is strong evidence to suggest that the benchmark approach should reflect a 10-year term, including:
  - The almost universal adoption of a 10-year term by Australian regulators, based on their assessment of the efficient approach adopted by infrastructure businesses; and
  - The current WATMI data, which strongly supports the continued use of a 10-year term.
- There is also strong evidence to suggest that the benchmark approach should reflect staggered debt issuances via the trailing average approach.
- ENA considers that there is no evidence to suggest that the benchmark approach of issuing 10-year debt on a staggered maturity basis has become inefficient since 2018, such that a change in approach is warranted. Consequently, ENA submits that the 10-year trailing average allowed return on debt should be maintained.
- Under the AER's trailing average framework, every change to the debt term would require a new transition mechanism to be put in place. An approach that re-sets the assumed term of debt at the time of each RoRI would create a system of nested transitions, such that each network would be part-way through a set of three different transition mechanisms at any point in time.

Primary recommendations

Recommendation 3: Maintain 10-year trailing average approach

The AER should maintain its 10-year trailing average approach to the allowed return on debt. This approach is consistent with efficient financing practice and with the observed practice of regulated networks, and it avoids a complex transition mechanism being implemented before the existing transition is complete.

1.5 The term for the allowed return on equity

Key messages

The nub of the issue

- The Concurrent Evidence sessions highlighted two potential views about the term of the risk-free rate:
  - One view is that the allowed return on equity should be set to match the market cost of equity capital. If the observed market practice is to use a 10-year risk-free rate, the regulatory allowance should also be based on a 10-year rate. Matching the regulatory allowance with the market cost of capital achieves NPV=0.

- The alternative view is that investors should use a 5-year risk-free rate because they should value regulated assets as the present value of (a) the regulatory allowances over the 5-year regulatory period, plus (b) the end-of-period RAB. Since no cash flows beyond year 5 are required for this exercise, a 5-year discount rate would be appropriate.

» This raises the question of whether the regulator should:

- Consider the approach that investors do adopt, based on evidence of market practice; or
- Consider the approach that Dr Lally says investors should adopt, based on his assumptions and derivations.

» The standard market practice is to use a 10-year risk-free rate, including for assets regulated by the AER. Market participants use a long-term rate because the relevant assets produce cash flows over a long term. They do not use a 5-year risk-free rate because the strong assumptions that are required to motivate that approach do not apply in practice.

Relevant context and the bar for change

» The possibility of a change in the term of the risk-free rate, from 10 years to 5, would have to be considered in the following context:

- The AER has considered this issue several times before (2009, 2013 and 2018 rate of return reviews) and has adopted a 10-year risk-free rate in every one of its decisions to date.
- In its 2018 review, the AER considered the NEO and NGO through the lens of the NPV=0 principle and concluded that a 10-year risk-free rate was appropriate.
- In its 2018 review, the AER also noted that a 10-year term:
  - Reflects the actual practices of investors, including investors in regulated assets. ENA has submitted extensive evidence on this, including the recent independent expert reports prepared for the Spark and AusNet transactions;
  - Is more consistent with the theory of the SL CAPM; and
  - Best reflects well accepted academic literature.
- A 10-year risk-free rate (or longer) is standard regulatory practice.
- A 10-year risk-free rate (or longer) is standard commercial practice. Notably a 10-year rate was adopted in the two recent transactions that involve businesses regulated by the AER.

» A 10-year risk-free rate (or longer) is recommended by leading textbooks, including Australian and international regulatory textbooks.

- In this context, it would seem reasonable to require a high bar for such a change. The current approach would only be changed if the AER were very sure that standard regulatory and commercial practice, and previous AER analysis of the issue, was wrong.
- However, the AER has not identified *any* new evidence to support a change in approach. The same consultant has provided the same advice to the AER since its inception.
- The most recent regulatory precedent where this issue was fully evaluated is the 2021 decision by the QCA to change from a 'term-matching' approach to a 10-year term based on observed market practice.

The case for a 5-year term

- The argument in support of a 5-year term is based on a set of assumptions that underpin a set of algebraic derivations. These derivations establish only that there must be a match between the return that the regulator allows and the return that investors require.
- Support for a 5-year term appears to be based on the notion that the CAPM (or finance theory more generally) requires that investors should use a 5-year term when valuing the cash flows from a regulated asset. [1]
- However, a move to a 5-year term for equity would be inconsistent with finance theory. Such a change would be based on the assumption that investors have no regard to reinvestment opportunities when developing their investment portfolios. That is, they have no regard to 'what comes next' after each 5-year regulatory period, which is inconsistent with asset pricing theory since Merton (1973).
- ENA submits that the case for a 5-year term falls well short of any reasonable threshold at this time.

Primary recommendations

Recommendation 4: A high bar for change should be applied to the term of the risk-free rate

It is reasonable to apply a high bar for change to the term of the risk-free rate, given that:

- The AER has considered this issue several times before (2009, 2013 and 2018 rate of return reviews) and has adopted a 10-year risk-free rate in every one of its decisions to date.
- In its 2018 review, the AER also noted that a 10-year term (a) Reflects the actual practices of investors, including investors in regulated assets. ENA has submitted extensive evidence on this, including the recent independent expert reports prepared for the Spark and AusNet transactions; (b) Is more consistent with the theory of the SL CAPM; and (c) Best reflects well accepted academic literature.
- A 10-year risk-free rate (or longer) is standard regulatory practice.
- A 10-year risk-free rate (or longer) is standard commercial practice. Notably a 10-year rate was adopted in the two recent transactions that involve businesses regulated by the AER.
- A 10-year risk-free rate (or longer) is recommended by leading textbooks, including Australian and international regulatory textbooks.

[1] For example, Lally (2021, p. 8) states that the term of the discount rate should match the term of the regulatory period " in accordance with the CAPM."

- No new evidence has been presented in this review.

Recommendation 5: The approach to debt and equity should be the same

For equity, like debt, the allowed return should be set to match the market cost of capital.

Recommendation 6: The case for a 5-year term does not bear scrutiny

The case for a 5-year term does not bear scrutiny because:

- The Lally derivations demonstrate no more than that NPV=0 requires that the regulatory allowance is set equal to the return that investors require.
- A 5-year term also requires that the market value of the regulated asset at the end of the regulatory period is known – at least to the extent that investors can value the network without regard to any cash flows beyond the regulatory period. This is clearly inconsistent with real-world observation.
- Applying the single-period CAPM to value the first five years of cash flows generated by a long-lived asset, independent of all subsequent cash flows, is inconsistent with finance theory. That might explain why such an approach is not applied in practice, including for regulated assets.

Recommendation 7: A 10-year term should be maintained

A 10-year risk-free rate should be maintained in the 2022 RoRI. The case for a 5-year term falls well short of any reasonable threshold at this time.

1.6 The market risk premium

Key messages

- The AER is considering two main sources of MRP evidence – the historical excess returns (HER) and dividend growth model (DGM) approaches. Consequently, it is important that the best possible estimates be obtained from each approach.
- For the HER approach:
  - Only arithmetic means should be used, for the reasons explained in leading textbooks; and
  - The Mathews (2019) estimates are unreliable and should receive no weight.
- For the DGM approach:
  - The ENA's calibrated DGM should receive significant weight because it adopts the AER's preferred specification, with a small modification to address the issues raised by the AER in 2018.
  - The type of 'variable growth rate' DGM considered in the *Final Omnibus* paper should receive no weight. There is no basis for the assumption that the current government bond yield for years 1 to 10 is a reasonable estimate of the perpetual growth in corporate dividends from year 11 and beyond.
- Among the approaches for distilling the HER and DGM (and any other relevant evidence) into a single MRP allowance, ENA's view is that:
  - The advice to the AER from its consultants and experts is that there is at least as much evidence for the Wright approach as there is for the historical excess returns approach.

- Exclusive reliance on the HER approach embeds the assumption that the MRP is constant, which is contrary to the evidence and advice provided to the AER by its consultants and the expert panel.
- Using the DGM to inform the selection of a figure from within the range of HER estimates makes no logical sense. The HER estimates differ only in terms of the start date for the historical period. The DGM does not provide information about the best start date. Rather, the primary value of the DGM evidence is to identify market conditions where the prevailing MRP might be different from the historical average.

» The best of the open approaches is for the AER to assess the HER and DGM evidence side-by-side and apply its regulatory judgment to select an appropriate point estimate at the time of the RoRI. If this approach does not lend itself to being codified into a process for mechanical updates, the selected MRP would remain fixed for the life of the RoRI.

Primary recommendations

Recommendation 8: No geometric means

Geometric means have no role to play in the AER's regulatory task. There is no rationale for having regard to geometric means and there are consistent and clear explanations from a range of sources as to why arithmetic means must be used in the AER's process.

Recommendation 9: Disregard Mathews (2019)

The Mathews (2019) analysis of historical excess returns is so affected by a range of fundamental problems that no regard should be given to it.

Recommendation 10: Have regard to DGMs (sensible specifications only)

The DGM approach has a strong theoretical basis and provides useful evidence about the forward-looking MRP. DGM specifications that are economically sensible and which address the AER's previous concerns should be used to inform the MRP allowance in the 2022 RoRI.

Recommendation 11: Consultants and experts advocate for Wright approach

ENA agrees with the advice of consultants and experts through the review – that there is at least as much evidence to support the use of the Wright approach as for the historical excess returns approach.

Recommendation 12: Do not explicitly rely on HER evidence alone

The MRP allowance should not be set on the basis of the HER evidence alone. That approach embeds the strong assumption that the MRP is effectively constant over time, which is inconsistent with the evidence and advice before the AER.

Recommendation 13: Do not effectively rely on HER evidence alone

There is no basis for using DGM (or other) evidence to select an estimate from within the range of HER estimates. The primary value of the DGM evidence is not in identifying which historical average might be more informative, but in identifying market conditions where the prevailing MRP might be different from the historical average.

Recommendation 14: Have real regard to all relevant evidence

ENA remains of the view that an approach that updates the MRP to reflect changes in the risk-free rate is most likely to produce internally consistent estimates of the allowed return on equity, but accepts that the AER has ruled out that approach.

The MRP allowance in the 2022 RoRI should be set by having real regard to all relevant evidence. The AER should apply its regulatory judgment, considering the strengths and weaknesses of each piece of evidence to produce an MRP allowance at the time of the RoRI.

Within the set of approaches that remain under consideration, ENA's view is that an approach that fixes the MRP for the duration of the RoRI is likely to be the only viable approach.

Recommendation 15: No survey evidence

Survey evidence is of such low quality that it should not be used to inform the estimate of the MRP. To the extent that survey evidence *is* used, it is important to consider the whole of the response and not just part of it, and to consider only contemporaneous surveys.

1.7 Equity beta

Key messages

- The fact that the AER's comparator set will have only a single live member at the time of the 2022 RoRI is clearly one of the most significant issues to be addressed by the AER during the 2022 review period. As the set of domestic comparators evaporates towards zero and becomes more and more out of date, it must logically receive less weight relative to the other evidence that is available.
- Other Australian and NZ regulators have recognised the problem of a very small set of domestic comparators and have regard to international comparators.
- Several other regulators report estimates of the equity beta of regulated energy networks. The ERA adopts a (like-with-like) equity beta of 0.79 and all others adopt equity betas above 0.8.
- ENA considers it reasonable to have some regard to this other relevant evidence as the confidence in the domestic comparators declines. We do not suggest that this other relevant evidence should be used in a formulaic or mechanical way, but rather that it may help to inform the exercise of the AER's regulatory judgment. It is difficult to see how one could have so much confidence in the reliability of the remaining domestic comparator evidence (now consisting of a single live firm whose comparability has previously been questioned by the AER) that no regard need be had to any other evidence.
- ENA also notes the well-accepted evidence of low-beta bias and proposes that this is relevant evidence that the AER should consider when exercising its judgment in setting the allowed return on equity.
- The AER should establish a substantive stakeholder consultation and review process focused on future methodology for beta estimation to commence following the 2022 RORI (in 2023).

Primary recommendations

Recommendation 16: Use a long data period (10 years)

ENA agrees with the AER's preference for estimating beta using a longer data period than the 2-5 years recommended by some of its consultants.

ENA proposes that a 10-year period provides a reasonable balance between recency/relevance and statistical stability.

Recommendation 17: Unsafe to rely on a data set with a single live comparator

The 2022 RoRI should not rely exclusively on a data set that consists of one live comparator. It should explain what other evidence the AER considers to be relevant and how that other evidence will be given more weight as the quality of the domestic evidence on beta deteriorates.

Recommendation 18: Have regard to the approaches adopted by comparable regulators

When setting the equity beta, the AER should have regard to the approaches and estimates of regulators performing a comparable task. Comparable regulators have regard to a broader set of evidence and have set equity beta allowances very materially higher than the AER's current figure.

Recommendation 19: Have regard to the evidence of low-beta bias

The AER should have regard to the established empirical evidence of low-beta bias when exercising its judgment in setting the allowed return on equity.

Recommendation 20: Have regard to all relevant evidence, including international comparators

When setting the equity beta, the AER should have regard to evidence from domestic and international comparators and the approaches and estimates of regulators performing a comparable task.

1.8 Use of the industry debt index

Key messages

- The AER's analysis of network debt data indicates that:
  - There have been some periods of network under-performance and some periods of network outperformance.
  - Average outperformance has been 4 basis points, with a standard error of 15 basis points.
- CEG reaches similar conclusions on the same data. CEG estimates between 0bp (tenor weighted) and 11bp (tenor and value weighted) under-performance.
- Both the AER and CEG estimate *under*-performance in the most recent period since July 2017. The historical period of outperformance is concentrated in the 2016 calendar year.
- Since the residual outperformance is neither material nor persistent at this time, there is no basis for any adjustment in relation to it. Rather, the evidence shows that the current benchmark approach using independent third-party data sources is performing well and that the AER has almost perfectly achieved the target of zero outperformance.
- Applying a cap to the AER's regulatory allowance (in relation to the episode of outperformance in 2016) would create a clear bias to negative outperformance. To see this, imagine retrospective application of such a cap. This would serve to reduce measured outperformance in one short historical period (CY 2016). But removing outperformance in this period would result in overall outperformance becoming negative using the AER measurement (and even more negative using the CEG measurement method).
- Applied prospectively, the results could be even more biased. The empirical justification for a cap is that there was outperformance in a single year (CY2016) when general credit spreads were high.

That is, there was a unique period when there was a divergence between NSP and general credit spreads. This is not a safe basis to assume that such divergence will always exist in the future when general credit spreads are high.

- The cap approach would only make sense if the AER was targeting net under-performance – an outcome where, on average, the regulatory allowance is lower than the actual costs incurred by networks. The AER has made clear this is not its goal.

Primary recommendations

Recommendation 21: Retain independent third-party data sources

The AER should continue to set the return on debt allowance on the basis of independent third-party data sources.

There is no case for any adjustment in relation to the EICSI.

Recommendation 22: Rule out asymmetric adjustments

The AER should rule out ever using the EICSI to place a cap on the return on debt allowance. Such an approach would introduce a bias and would only be appropriate if the AER was targeting average under-performance relative to its allowance.

1.9 Weighted tailing average return on debt

Key messages

- The weighted trailing average appears to be designed to help support the commercial viability of large new projects in the event that interest rates rise above the trailing average allowance.
- However, the proposed weighting scheme is insufficient, in and of itself, to address this commercial viability problem. Indeed, the proposed weighting schemes may actually *exacerbate* the problem.
- ENA's view is that there is a need for consultation on this issue between networks, consumers and the AER – with a focus on how the AER's rate of return allowance might support the commercial viability of major new projects. The consultation should include any proposed approaches to implementing the weighed trailing average return on debt and other rate of return options to help support the commercial viability of large new projects. If that consultation cannot be accommodated within the RoRI process, a separate process should be commenced as soon as possible, given the urgent need for some of these projects.

Primary recommendations

Recommendation 23: A full consultation on the commercial viability of major new projects is required

There is an urgent need for consultation on how the AER's rate of return allowance might support the commercial viability of major new projects. If that consultation cannot be accommodated within the RoRI process, a separate process should be commenced as soon as possible.

1.10 Cross checks

Key messages

RAB multiples

- The aggregated RAB multiple reflects not just the present value of expected regulatory allowances, but also the present value of incentive payments, revenue from unregulated assets and future projects, expected increases in future AER allowances, and other things.
- It is entirely possible that the present value of expected regulatory allowances is less than the RAB, even though the aggregated RAB multiple is above 1 – due to these other sources of value. Consequently, RAB multiples have zero informative value unless the present value of expected regulatory allowances can be fully and transparently separated from other sources of value.

Recent transaction evidence

- Independent expert estimates of the market cost of equity capital have recently been prepared for two electricity network businesses that are regulated by the AER. Both report that the current market cost of equity capital is materially higher than the AER's current regulatory allowance. ENA considers this to be highly relevant and informative evidence.

Comparable regulatory determinations

- ENA considers that the AER's estimation process might be informed by information about:
  - The types of data that other regulators consider;
  - The statistical and other methods that other regulators use to estimate parameters; and
  - The way in which other regulators exercise their regulatory judgment.
- All of this information would be highly relevant in assisting the AER to understand what is driving its allowed return on equity to be lower than that of comparable regulators, and determining whether any revision of the AER's approach might be warranted.

Financeability analysis

- ENA proposes that a financeability analysis would be applied to the benchmark firm via the PTRM, with the goal of testing whether the allowed return supports the credit rating that was assumed in deriving it.
- This internal consistency would appear to be required to support the NPV=0 principle.

Scenario analysis

- Scenario analysis is designed to ensure that the RoRI is robust to, and provides sensible allowances, across the range of financial market conditions that might be reasonably contemplated over the life of the instrument.
- Ensuring that the RoRI is robust to a range of future market scenarios is more important for the AER than for other regulators, due to the nature of the binding instrument legislation.

Primary recommendations

Recommendation 24: No regard to RAB multiples

The 2022 RoRI should have no regard to any RAB multiple unless it can be accurately disaggregated by removing all components of enterprise value other than the present value of current regulatory allowances on the existing RAB.

Recommendation 25: Recent independent expert estimates are highly relevant evidence

The 2022 RoRI should have regard to recent independent expert estimates of the required return on equity. This is clearly relevant evidence about the market cost of equity capital.

Recommendation 26: Have regard to what comparable regulators do

The 2022 RoRI should have regard to the data, methods, and regulatory judgment exercised by comparable regulators engaged in a comparable task.

Recommendation 27: Perform a financeability assessment on the benchmark firm

The 2022 RoRI should include a financeability assessment on a notional benchmark firm. The allowed return on capital should be sufficient to support the credit rating that was assumed when computing it.

Recommendation 28: Conduct and publish scenario testing

The 2022 RoRI should include a small number of published scenario outputs for the cost of equity, debt and rate of return under a set of scenarios considered plausible by the regulator. These should focus on providing stakeholders with a reasonable sense of the potential outcomes of applying the Instrument on estimates of the rate of return across a set of foreseeable market conditions.

2 Proposed implementation principles

Key messages

- The NEO and NGO are best achieved by setting the allowed return to reflect the best estimate of the market cost of capital at the time of each decision.
  - ENA notes the importance of setting an unbiased allowance in every decision – it is not enough that any biases might tend to cancel out over the long-run.
- The AER should have real regard to all relevant evidence.

2.1 The AER's assessment criteria

The AER has set out the following criteria for assessing evidence throughout its RoRI process:

- Reflective of economic and finance principles and market information;
- Fit for purpose;
- Implemented in accordance with good practice;
- Models are based on quantitative modelling that is sufficiently robust and avoids arbitrary filtering;
- Market data is credible, verifiable, comparable, timely and clearly sourced;
- Flexible to allow changing market conditions and new information;
- Materiality; and
- Longevity or sustainability of new arrangements.

The remainder of this section sets out ENA's observations about how these criteria would be supported by two implementation principles.

2.2 The NEO and NGO are best achieved by setting the allowed return to reflect the best estimate of the market cost of capital at the time of each decision

ENA considers that setting the allowed return on capital as the best unbiased estimate of the market cost of capital at the time of the determination is reflective of economic and finance principles, it is also reflective of market information, it is fit for purpose, and accords with good practice.

In this regard, ENA strongly supports the AER's conclusion that:

> *In our view, the best possible estimate of the expected rate of return—neither upwardly biased nor downwardly biased—will promote efficient investment in, and efficient operation and use of, energy network services. We consider that the NEO, NGO, and the long-term interests of consumers are best served through this guiding principle.*[2]

[2] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 8.

The AER has previously noted that setting the allowed return to reflect the market cost of capital will produce an unbiased estimate consistent with the NPV=0 condition:

> *Because the market for capital finance is competitive, an efficient service provider is expected to face competitive prices in the market for funds. Therefore, we consider efficient financing costs are reflected in the **prevailing market cost of capital** (or WACC) for an investment with a similar degree of risk as that which applies to a service provider in respect of the provision of regulated services. As Alfred Kahn stated, 'since the regulated company must go to the open capital market and sell its securities in competition with every other would-be issuer, there is clearly a market price (a rate of interest on borrowed funds, an expected return on equity) that it must be permitted and enabled to pay for the capital it requires'.*
>
> *We consider employing a rate of return that is commensurate with the **prevailing market cost of capital** (or WACC) is consistent with the zero NPV investment condition (see above). We also consider economic efficiency more generally is advanced by employing a rate of return that reflects **rates in the market for capital finance**. Similarly, Partington and Satchell interpret efficient financing costs as the opportunity cost of capital, which is a market rate of return for assets with a given level of risk.*[3]

ENA also agrees with the AER's analysis of the problems that arise if the allowed return is not set equal to the best possible estimate of the market cost of capital at each point in time:

> *If the rate of return is set upwardly (downwardly) biased:*
>
> - *Investors will be over (under) compensated for the risk involved in supplying capital to networks, so will show increased (decreased) willingness to invest in regulatory assets in comparison with other investments in the economy.*
> - *Networks will have an incentive to over-invest in regulated assets over the longer term, increasing the regulatory asset base above the efficient level. (Networks will not be able to attract sufficient funds to be able to make the required investments in the network. Over the longer term there will be declines in quality, reliability, safety and/or security of supply of electricity or gas).*
> - *Energy consumers will pay inefficiently higher prices, which will distort energy consumption decisions, and downstream investment decisions. This will result in efficiency losses where consumers use less energy network services than otherwise and non-monetary impacts such as disconnection of vulnerable consumers. (Consumers of energy will pay lower prices, at least in the short term; but will face the risk of adverse outcomes for quality, reliability, safety and/or security of supply of energy services. Lower prices will also distort energy consumption and downstream investment decisions (though in the opposite direction to the previous case). This new level of downstream investment will be inefficient for the Australian economy).* [4]

ENA notes the importance of setting an unbiased allowance in every decision – it is not enough that any biases might tend to cancel out over the long-run.

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[3] AER, December 2018, *Rate of Return Instrument, Final Decision, Explanatory Statement*, p. 33, emphasis added.
[4] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 8.

In particular, the NEO and NGO are best achieved by seeking to ensure that consumer prices are fair and efficient in every period, rather than being too high in some periods and too low in others. And it is important that efficient levels of investment occur in every period, rather than having some periods of over- and some periods of under-investment.

The *Final Omnibus* paper makes a similar observation. For example, the AER has noted the need for the regulatory allowance to properly reflect the market cost of equity capital at the time of each decision – not simply on average over the long run:

> *Under a risk-free rate trailing average approach, the cost of equity would no longer reflect* ***the cost of equity capital in the market at a given point in time*** *and is therefore unlikely to best achieve the NEO.*[5]

The AER made a similar point in its Inflation Review:

> *[W]e note that a method that results in an unbiased estimate is not sufficient to be regarded as a good method, as it must also be accurate. A method that simply fixed expected inflation at a historical average may be regarded as unbiased—as it is unlikely to be consistently above or below the correct estimate over the long term—but that does not mean [it] is a good estimate of expected inflation for a given term.* [6]

ENA endorses the view that we are seeking an unbiased estimate of the market cost of capital at the time of the RoRI and that objective underpins this submission.

2.3 Having regard to all relevant evidence

ENA supports the principle that all relevant evidence should be considered when determining the allowed return on capital.

In the 2018 RoRI, the AER set some parameter values based on a single preferred piece of evidence or method. For example, beta was set on the basis of domestic comparator evidence and the MRP was set on the basis of the historical excess returns evidence. In both cases, no other evidence had any impact on the final estimates that were adopted.

ENA accepts that, in having real regard to all relevant evidence, the AER will have to apply regulatory judgment rather than a formulaic process.

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[5] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 65, emphasis added.
[6] AER, October 2020, *Inflation review Final Decision*, p. 19.

3 Review context: return on equity to support needed investment

Key messages

- When considering the allowed return on equity, the relevant context is that:
  - The AER's allowed return on equity is currently lower than at the time of any previous rate of return review.
  - The Brattle report commissioned by the AER demonstrated that the AER's allowed return on equity was, by every metric, lower than that of all comparable regulators that were examined. Brattle concluded that the AER's approach was "not as effective" as that of other regulators.
  - The independent expert valuation reports prepared as part of the recent Spark Infrastructure and AusNet Services transactions concluded that the current market cost of equity capital (with gearing at 60%) is 200 basis points higher than the AER's current allowance.
  - Networks are being asked to invest very material amounts of new capital to support and enable the decarbonisation of the Australian economy. The AEMO draft ISP estimates that consumers will receive $2.50 of benefits for every dollar of new network investment.

ENA notes that the key issues remaining at this stage of the review process relate primarily to the allowed return on equity. There are significant issues remaining in relation to the term of the risk-free rate and the data and methods that should be used to estimate the equity beta and market risk premium parameters.

3.1 Return on equity allowances

When considering the AER's approach to the allowed return on equity, it is important to understand the context of the current review as follows:

- The AER's allowed return on equity is currently lower than at the time of any previous review;
- The Brattle report commissioned by the AER demonstrated that the AER's allowed return on equity was, by every metric, lower than that of all comparable regulators that were examined and Brattle concluded that the AER's approach was "*not as effective*" as that of other regulators. Brattle reported to the AER that:
  - The AER's allowed nominal return on equity is lower than that adopted by every other regulator for which a comparison could be made;[7]
  - The AER's allowed real return on equity is lower than that adopted by every other regulator for which a comparison could be made. The closest allowed real return on equity is almost double the AER's allowance;[8]

[7] Brattle, June 2020, *A Review of international approaches to regulated rates of return*, Table 4, Row 3, p. 49.
[8] Brattle, June 2020, *A Review of international approaches to regulated rates of return*, Table 4, Row 9, p. 49. 2.42% vs. 4.19%.

- The AER's allowed nominal equity risk premium is lower than that adopted by every other regulator for which a comparison could be made. (This does not account for other regulators that set the allowed risk-free rate above the prevailing government bond yield.);[9] and
- The AER's allowed real equity risk premium is lower than that adopted by every other regulator for which a comparison could be made. (This metric is not affected by any cross-country interest rate differentials and is conservative in that it does not account for other regulators that set the allowed risk-free rate above the prevailing government bond yield.)[10]

» The independent expert valuation reports prepared as part of the Spark and AusNet transactions concluded that the current market cost of equity capital (with gearing at 60%) is very materially higher than the AER's current regulatory allowance, as shown in the tables below.

Table 1: KPMG estimates of the market cost of equity capital: Spark Infrastructure transaction

	AER current	KPMG low	KPMG high
Risk-free rate	1.73%	2.80%	2.80%
MRP	6.1%	6.0%	6.0%
Equity beta	0.60	0.73	0.83
Return on equity	**5.39%**	**7.17%**	**7.76%**

Source: Source: KPMG independent expert report, Table 39, p. 105. Equity beta re-levered to 60% using AER re-levering approach. AER current risk-free rate taken as at date of KPMG report.

Table 2: Grant Samuel estimates of the market cost of equity capital: AusNet Services transaction

	AER current	GS risk-free rate adjusted	GS MRP adjusted
Risk-free rate	1.8%	3.1%	1.8%
MRP	6.1%	6.0%	8.0%
Equity beta	0.60	0.81	0.81
Return on equity	**5.5%**	**8.0%**	**8.3%**

Source: Grant Samuel, December 2021, Independent expert report for AusNet Services, Appendix 3, pp. 9-15. Equity beta re-levered to 60% using AER re-levering approach.

[9] Brattle, June 2020, *A Review of international approaches to regulated rates of return*, Table 5, Row 4, p. 50.
[10] Brattle, June 2020, *A Review of international approaches to regulated rates of return*, Table 5, Row 9, p. 50.

ENA submits that a useful part of the current review will be to gain an understanding of why the AER's regulatory allowance is lower than the allowances of other regulatory and commercial estimates.

3.2 Scale of required investment to support decarbonisation

The scale of required network investment is unprecedented both in the industry's history and under a model of private investment financing.

This is required to deliver benefits to consumers including lowering wholesale market prices by unlocking renewable generation and the decarbonisation of the gas and electricity sectors.

The AEMO draft 2022 Integrated System Plan (ISP):

- Forecasts $12.5 billion of actionable ISP projects (i.e., those it considers are critical for immediate development) with most requiring delivery before 2030,[11] with even more forecast to be needed to support hydrogen production for domestic use in transport and firming the NEM, and for export;
- Expects a two to three times faster exit of coal than previously forecast[12], which:
  - Hastens both the need for grid investment to integrate renewables, and the scale and timing of system strength investment to meet new obligations on TNSPs by the AEMC's 2021 system strength rule change, and
  - Reflects projections predating Origin's announcement that it will close its Eraring coal-fired power station by 2025 and the recent Atlassian/Brookfield bid to acquire AGL and hasten its coal exit;
- Is already attracting criticism from some energy market participants for being conservatively low and slow in its planning of transmission augmentations, jeopardising both the attraction of renewable generation investment and customer price and reliability outcomes.[13]

The AER has approved forecast network investment of around $19.1billion by electricity distribution networks in their current regulatory periods.[14] This is before accounting for investments these networks will need to make to:

- Deliver on their new service obligation for hosting DER following the AEMC's 2021 rule change
- facilitate the electrification of the transport sector; and
- Meet customers' increasing expectations for a more resilient power system amid increased severe weather events and fires.

The investment need and net customer benefits are undisputed among accountable agencies. Every market body or policy agency with accountability for energy outcomes has recognised the critical and growing role that new grid investment will have. We are seeing unprecedented levels of government policy support for network investment facilitation and expedition.

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[11] AEMO, Draft 2022 Integrated System Plan, Dec 2021, p.61.
[12] AEMO, Draft 2022 Integrated System Plan Overview, Dec 2021, p.2.
[13] The Australian, Snowy Hydro warns of high costs and potential blackouts if AEMO's energy blueprint proceeds, 9 February 2022.
[14] AER, State of the Energy Market 2021, July 2021, p.154.

The chair of the AEMC and ESB has observed that while overall customer prices are going down, network "*prices are going up and are expected to accelerate over the years ahead as significant new investments are needed to connect new renewables."* [15] This is backed by AEMO's draft 2022 ISP which forecasts that the customer benefits of critical electricity transmission investments are 2.5 times the cost of those network investments, totalling some $29 billion in market benefits.[16]

Further discussion of the set of complementary and integrated network investments likely to be needed to secure the meeting of customer expectations across electricity and gas network infrastructure is set out in ENA's recently released *Energy Vision: Networks delivering net zero*.

[15] Anna Collyer, *Road to cheaper energy*, The Australian, 29 November 2021.
[16] AEMO, December 2021, *Draft 2022 Integrated System Plan Overview*, p. 3.

4 Use of independent terms for forecast inflation and return on debt and equity

Key messages

- ENA agrees with the AER's conclusion that the term for expected inflation and the term for the rate of return should be assessed independently and do not need to align with each other.
- Similarly, the return on debt and the return on equity should be assessed independently and do not need to align with each other.

4.1 The term for expected inflation and the allowed return on capital are independent

ENA agrees with the AER's conclusion that:

> *The term for expected inflation and the term for the rate of return should be independently assessed and do not need to align with each other.*[17]

We also note that this conclusion is consistent with our submission to the AER's Review of Regulatory Inflation:

> *ENA notes that the AER seeks to set the regulatory inflation parameter so that the deduction from allowed revenues in the Post Tax Revenue Model (PTRM) is equal to the expected value of Regulatory Asset Base (RAB) indexation in the Roll Forward Model (RFM). ENA refers to this as the 'take out what you expect to put back in' framework. Under this framework, 5-year inflation is 'put back in,' so 5-year inflation must be 'taken out.' That is, the term of the inflation parameter is determined by the RFM and not the Rate of Return Instrument (RoRI) or any other rate of return parameter.*[18]

In summary, ENA's view is that there is no relationship between the term used for expected inflation and the term used to determine the allowed return on capital. Rather, the term should reflect the role of each parameter within the AER's regulatory framework.

The role of the inflation parameter is to "take out what you expect to put back in." What is "put back in" is actual inflation over five years. Consequently, what is "taken out" must be expected inflation over five years.

By contrast, the role of the allowed return on capital is to compensate for the efficient market cost of capital. Consequently, the regulatory term should reflect the efficient market cost of capital – the term that is used in the market when setting the returns that are required on debt and equity capital. There is

[17] AER, May 2021, *Term of the Rate of Return: Draft Working Paper*, p. 32.
[18] ENA, November 2020, *Review of the Regulatory Treatment of Inflation: Response to AER Draft Position*, p. 5.

no link between the efficient cost of capital in financial markets and the mechanics of the AER's treatment of regulatory inflation within the PTRM.[19]

In this regard, we note that Dr Lally has also advised the AER that the terms for regulatory inflation and allowed returns are entirely separate and the term for one has no implication for the term of the other. Dr Lally's advice is that a 5-year term should be used for inflation regardless of the term adopted for the allowed return on capital. He specifically noted that a 5-year term for inflation should be used even if the AER were to adopt a 10-year term for the allowed return.[20]

That is, Dr Lally's view that a 5-year term should be used both for regulatory inflation and the allowed return on equity are two separate issues and have two separate bases. It is not the case that a 5-year term for one implies that a 5-year term should be adopted for the other.

Recommendation 1: Separate term for inflation and allowed return on capital

There is no link between the efficient cost of capital in financial markets and the mechanics of the AER's treatment of regulatory inflation within the PTRM and RFM. Consequently, the terms for regulatory inflation and the allowed return on capital are independent.

ENA considers that there is no reason why the term for one of these elements has any particular implications for the others. For example, it would clearly be simplistic to suggest that because the NPV=0 principle requires a 5-year term for regulatory inflation a 5-year term should also be adopted for the return on debt or equity.

ENA agrees with the AER that there are separate bases for determining the appropriate terms for each of the three elements above:

> *Our preliminary view was that the terms for the return on equity, return on debt and expected inflation should be set independently based primarily on the NPV=0 principle. If they are the same value, it should be the result of analysis rather than explicit requirement,*[21]

and supports the AER's conclusion that its:

> *Preferred position is to maintain our draft paper view.*[22]

[19] That is, the AER first estimates the efficient nominal cost of capital. It then turns to how that return will be delivered – providing part of it as a cash return via the regulatory allowance and part of it via RAB indexation. The second step is independent of the first, and simply requires that the two components of the allowed return add up (in expectation) to the efficient nominal cost of capital estimated in the first step.

[20] Lally, M., July 2020, *Review of the AER's inflation forecasting methodology*, p. 6.

[21] AER, September 2021, *Term of the rate of return & Rate of return and cashflows in a low interest rate environment: Final Working Paper*, p. 21.

[22] AER, September 2021, *Term of the rate of return & Rate of return and cashflows in a low interest rate environment: Final Working Paper*, p. 43.

4.2 The term for the allowed return on debt and the allowed return on equity are independent

ENA agrees with the AER's conclusion that:

> *The term for the rate of return on debt and the return on equity should be independently assessed and do not need to align with each other.*[23]

ENA considers that there is no requirement for the allowed return on equity and the allowed return on debt to be based on the same term.

In both cases, the term that is adopted should reflect the efficient market cost of capital.

For example, if the AER determines that a prudent and efficient approach is to issue 10-year debt on a staggered maturity basis, it is appropriate for the regulatory allowance to reflect the cost of that approach.

In this regard, ENA agrees with the AER that the 10-year trailing average approach reflects the cost of efficient debt financing practice:

> *This approach means that the allowed return on debt more closely aligns with the efficient debt financing practices of regulated businesses.*[24]

Similarly, if the evidence suggests that investors in the market determine the efficient cost of equity capital using a 10-year risk-free rate, that is what should be adopted when setting the regulatory allowance.

In this regard, the AER explains the role of the CAPM within its regulatory framework as follows:

> *We use the CAPM to estimate how an investor will value the potential returns from an investment in an infrastructure business with long-lived underlying assets. Equity investors seek out efficient returns for their diversified investment portfolio over long-term investment horizons.*[25]

Thus, if the evidence suggests that investors use a 10-year risk-free rate when determining the potential returns from an investment in an infrastructure business with long-lived underlying cash flows, that is what should be adopted when setting the regulatory allowance.

Recommendation 2: Term for debt and equity should reflect what investors require

The allowed return on debt should reflect the term that debt investors use when determining the return they require.

Similarly, the allowed return on equity should reflect the term that equity investors use when determining the return they require.

[23] AER, *Term of the Rate of Return: Draft Working Paper*, May 2021, p. 32.
[24] AER, December 2013, *Final Rate of Return Guideline: Explanatory Statement*, p. 12, emphasis added.
[25] AER, December 2018, *Rate of Return Instrument Explanatory Statement*, p. 127.

5 The implications of NPV=0 for term issues

Key messages

- The NPV=0 principle requires that the regulatory allowance should match the return that is required by investors; no more and no less.
- The NPV=0 principle is supported by adopting the following approach:
  - For debt, the regulatory allowance should reflect the term that determines the return that debt investors require;
  - For equity, the regulatory allowance should reflect the term that determines the return that equity investors require; and
  - For inflation, the regulatory figure should ensure that what is 'taken out' equals what is expected to be 'put back in.'

Definition of the NPV=0 principle

ENA considers that the NPV=0 principle requires that the regulatory allowance should match the return that is required by investors; no more and no less. If this equality is preserved, the regulatory allowances are computed and discounted at the same rate so that the present value of the allowances is equal to the current value of the regulated asset.

In this regard, the *Final Omnibus* paper sets out the Partington and Satchell definition of NPV=0 that the AER adopted in its 2018 RoRI process:

> *The zero NPV investment criterion has two important properties. First, a zero NPV investment means that the ex-ante expectation is that over the life of the investment the expected cash flow from the investment meets all the operating expenditure and corporate taxes, repays the capital invested and there is just enough cash flow left over* ***to cover investors' required return on the capital invested****. Second, by definition a zero NPV investment is expected to generate no economic rents. Thus, ex-ante no economic rents are expected to be extracted as a consequence of market power.* ***The incentive for investment is just right, encouraging neither too much investment, nor too little****.*[26]

Importantly, the NPV=0 criterion is centred around the returns that real-world investors might reasonably require on the capital that they invest. The NPV=0 criterion is not an abstract, arcane, or complex theoretical exercise. It simply involves setting the allowed return to reflect the evidence about what return investors require on the capital they invest.

Application to the allowed return on debt

The allowed return on debt should be set to reflect the return that debt investors require to provide debt capital to the firm. ENA agrees with the advice that Dr Lally has provided to the AER on this point:

[26] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 91, emphasis added.

> *Thirdly, in respect of the cost of debt, satisfying the NPV = 0 principle requires that the allowed cost of debt match that incurred by the benchmark efficient firm.* [27]

ENA also agrees with the AER's interpretation of the advice that it has received from Dr Lally in relation to the NPV=0 principle as it relates to the allowed return on debt:

> *In respect of satisfying the NPV=0 principle, the [allowed] return on debt must match that incurred by the benchmark efficient firm.* [28]

and:

> *Dr Lally noted that satisfying the NPV=0 condition would require matching the interest rate incurred by a benchmark efficient firm with the regulatory allowance which also entails matching of the term.* [29]

Thus, there is agreement that, in relation to the return on debt, the NPV=0 principle is satisfied by ensuring that the regulatory allowance is set to match the return that investors require. Thus, the regulatory task is to determine the return that investors would require to provide debt capital to the firm.

Application to the allowed return on equity

During the Concurrent Evidence sessions, Ms Savage summarised the alternative views about the application of the NPV=0 principle to the term of the allowed return on equity:[30]

- One view is that the NPV=0 principle is satisfied by ensuring that the regulatory allowance is set to match the return that investors require. When evaluating regulated network assets, investors consider a long term of cash flows and use a corresponding long-term (10-year) risk-free rate when determining their required returns. Under this approach, NPV=0 is achieved by adopting a 10-year risk-free rate, such that the allowed return reflects the required return of real-world investors.
- The alternative view is that a 5-year risk-free rate should be used to be commensurate with the 5-yearly re-setting of regulatory allowances. Under this approach, investors would (or should) value regulated assets as the present value of the regulatory allowances over the 5-year period and the closing RAB at the end of 5 years. Since no cash flows beyond year 5 are required, a 5-year discount rate would be appropriate.

In Section 7 of this submission, ENA presents extensive evidence that the standard market practice is to use a 10-year risk-free rate, including for assets regulated by the AER. Market participants use a long-term rate because the relevant assets produce cash flows over a long term. They do not use a 5-year risk-free rate because the strong assumptions that are required to motivate that approach do not apply in practice.

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[27] Lally, April 2021, *The appropriate term for the allowed cost of capital*, p. 3.
[28] AER, May 2021, *Term of the Rate of Return: Draft Working Paper*, p. 30.
[29] AER, September 2021, *Term of the rate of return & Rate of return and cashflows in a low interest rate environment: Final Working Paper*, p. 22.
[30] https://www.aer.gov.au/system/files/AER%20-%20Concurrent%20Evidence%20Session%202%20-%20Proofed%20Transcript%20-%20February%202022.pdf, pp. 40-41.

ENA is unaware of any evidence before the AER suggesting that a 5-year risk-free rate might be used by market participants or that any regulated infrastructure asset has ever been valued by any investor using cash flows over 5 years, without regard to longer term cash flows thereafter.

Thus, the decision for the AER boils down to whether the NPV=0 principle is supported:

- By setting the allowed return to reflect the return that investors actually require, in accordance with the Partington-Satchell definition above; or
- By setting the allowed return in a way that is inconsistent with the observed practice of infrastructure investors.

The latter approach is said to be motivated by finance theory – that investors should (theoretically) use a 5-year discount rate to value regulated assets as the present value of the regulatory allowances over the 5-year period and the closing RAB at the end of 5 years.

In Section 7 of this submission, we explain that:

- Finance theory does *not* suggest that a 5-year risk-free rate should be adopted. A 5-year rate would only be appropriate under a specific set of very restrictive assumptions that do not hold in practice;
- In any event, the clear evidence that the actual market practice is to use a 10-year risk-free rate is what should guide the AER's regulatory allowances.

In this respect, ENA's view is that the NPV=0 principle has precisely the same implications for the allowed return on equity as it does for the allowed return on debt. The NPV=0 principle is satisfied by ensuring that the regulatory allowance is set to match the return that market investors require.

Application to regulatory inflation

Having set the allowed return on debt and equity to match the return that investors require, the AER then delivers that return in two steps:

- The AER makes a deduction for expected inflation in the PTRM; and then
- The AER adds back actual outturn inflation in the RFM.

In order to preserve the NPV=0 result that comes from matching the allowed return with the required return, it is necessary for the AER to equate what it 'takes out' in the PTRM with what it expects to 'put back' in the RFM.

Since the AER 'puts back' actual inflation over five years, it must take out expected inflation over five years.

Implications for term assumptions

ENA considers that the term adopted for return on debt, return on equity and regulatory inflation should be set independently:

- For debt, the regulatory allowance should reflect the term that determines the return that debt investors require;
- For equity, the regulatory allowance should reflect the term that determines the return that equity investors require; and
- For inflation, the regulatory figure should ensure that what is 'taken out' equals what is expected to be 'put back in.'

6 The term for the allowed return on debt

Key messages

- The NPV=0 principle is supported by identifying a prudent and efficient benchmark debt financing approach and then setting the regulatory allowance to reflect the cost of that benchmark approach.
- There is strong evidence to suggest that the benchmark approach should reflect a 10-year term, including:
  - The almost universal adoption of a 10-year term by Australian regulators, based on their assessment of the efficient approach adopted by infrastructure businesses; and
  - The current WATMI data, which strongly supports the continued use of a 10-year term.
- There is also strong evidence to suggest that the benchmark approach should reflect staggered debt issuances via the trailing average approach.
- ENA considers that there is no evidence to suggest that the benchmark approach of issuing 10-year debt on a staggered maturity basis has become inefficient since 2018, such that a change in approach is warranted. Consequently, ENA submits that the 10-year trailing average allowed return on debt should be maintained.
- Under the AER's trailing average framework, every change to the debt term would require a new transition mechanism to be put in place. An approach that re-sets the assumed term of debt at the time of each RoRI would create a system of nested transitions, such that each network would be part-way through a set of three different transition mechanisms at any point in time.

6.1 Implications from the NPV=0 principle

The previous section notes that the allowed return on debt should be set to reflect the return that debt investors require to provide debt capital to the firm. ENA agrees with the advice that Dr Lally has provided to the AER that:

> *in respect of the cost of debt, satisfying the NPV = 0 principle requires that the allowed cost of debt match that incurred by the benchmark efficient firm.* [31]

ENA also agrees with the AER's interpretation of the advice that it has received from Dr Lally in relation to the NPV=0 principle as it relates to the allowed return on debt:

> *In respect of satisfying the NPV=0 principle, the [allowed] return on debt must match that incurred by the benchmark efficient firm.* [32]

[31] Lally, April 2021, *The appropriate term for the allowed cost of capital*, p. 3.
[32] AER, May 2021, *Term of the Rate of Return: Draft Working Paper*, p. 30.

and:

> *Dr Lally noted that satisfying the NPV=0 condition would require matching the interest rate incurred by a benchmark efficient firm with the regulatory allowance which also entails matching of the term.* [33]

Thus, there is agreement that, in relation to the return on debt, the NPV=0 principle is satisfied by ensuring that the regulatory allowance for the cost of debt is set to match the efficiently incurred costs of a network's debt funding.

6.2 The regulatory task begins with the definition of the benchmark financing approach

ENA considers that the regulatory approach to the return on debt is to first identify a prudent and efficient debt financing approach and to then set the regulatory allowance to reflect the cost of that approach.

ENA agrees with the QCA's recent description of the regulatory task in this regard:

> *Before estimating a regulatory cost of debt allowance,* ***it is necessary to choose a benchmark debt management strategy as the basis for this estimation process****.*
>
> ***Once a benchmark debt management strategy has been chosen, the cost of debt (and hence a cost of debt allowance) can be estimated.*** *The estimation process requires data and methodology decisions. The cost of debt data source reflects the characteristics of the benchmark firm's debt.*
>
> *This involves making decisions in relation to the type of debt, credit rating and term of debt. The methodology that is applied should best reflect the benchmark debt management strategy chosen.*[34]

6.3 The benchmark efficient term of debt (10 years)

Evidence from regulatory determinations

ENA agrees with the QCA's recent conclusion that a 10-year term reflects an efficient debt financing practice for regulated infrastructure entities and is therefore an appropriate regulatory benchmark:

> *We consider calculating a 10-year cost of debt is consistent with the efficient debt financing practices of regulated infrastructure entities with long-lived assets. Issuing debt for longer terms, such as 10 years, can help manage refinancing risk. Calculating a 10-year cost of debt is also widely accepted and applied by Australian regulators, except for ERA in its energy decisions.*[35]

The QCA summarises the practice of Australian regulators in Table 3 below, noting that the standard approach is to adopt a 10-year term as reflecting a prudent and efficient debt financing strategy.

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[33] AER, September 2021, *Term of the rate of return & Rate of return and cashflows in a low interest rate environment: Final Working Paper*, p. 22.
[34] QCA, November 2021, *Rate of return review: Final report*, pp. 28-29, emphasis added.
[35] QCA, November 2021, *Rate of return review: Final report*, p. 39.

Table 3: term of debt adopted by Australian regulators

Regulator	*Cost of debt term*
AER	10 years
ESC	10 years
IPART	10 years
ESCOSA	10 years
ERA (electricity)	5 years (risk-free rate), 10 years (DRP)
OTTER	10 years
ICRC	10 years

Sources: AER, Rate of return instrument, explanatory statement, December 2018; ESC, Melbourne Water's 2021 water price review, guidance paper, November 2019; IPART, Review of our WACC method, final report, February 2018; ESCOSA, SA Water Regulatory Determination, final determination, June 2020; ERA, Final Decision on Proposed Revisions to the Access Arrangement for the Western Power Network—Appendix 5: Return on Regulated Capital Base, final decision, September 2018; OTTER, 2018 Water and Sewerage Price Determination Investigation, final report, May 2018; ICRC, Regulated water and sewerage services prices 2018–23, final report 1, May 2018.

Source: QCA, November 2021, Rate of return review: Final report, Table 7, p. 38.

The current WATMI data supports retention of the 10-year term

The current WATMI data supports the retention of a 10-year term. That is, the departures from the issuance of long-term debt are few and they tend to be associated with temporary financing structures that have been put in place after recent privatisations.

ENA has engaged CEG to compute the WATMI for different sets of the network data and the results are summarised in Table 4 overleaf.

Table 4: WATMI for different sets of network data

	30 June 2018	30 June 2019	30 June 2020	30 June 2021
Excluding subordinated debt				
All firms	9.1	9.2	9.2	9.5
NSW firms excluded	9.8	9.8	9.9	10.2
Including subordinated debt				
All firms	9.5	9.5	9.6	10.7
NSW firms excluded	10.4	10.3	10.4	11.9

Source: CEG. Note: Where available actual draw-down values are used. Where actual draw-down values are not provided the average draw-down percentage across all revolving instruments is used. Excluded instruments include those identified as: bridge finance, "capex", commercial paper, convertible to equity, leases, overdrafts and "working capital". Also excluded are instruments that had their term extended. The only material impact of these exclusions is for the latter category (instruments with term extensions) and only for some instruments issued at the time of privatisation and subsequently extended. If the extensions are treated as "new debt" with a term equal to the length of the extension (i.e., less than the original term plus the extension) then the WATMI for all firms (excluding hybrids) at 30 June 2021 falls from 9.5 to 9.1 years.

Table 4 shows that:

- The WATMI across all firms is very close to 10 years. This is even before the inclusion of subordinated debt in the analysis. Even if subordinated debt is excluded from the analysis, the WATMI in June 2022 across all firms is 9.5 years (i.e., very close to 10 years). Including subordinated debt raises the WATMI to more than 10 years. It is not clear why subordinated debt should be excluded. The AER has not explained why the issuance of subordinated debt would be inefficient or imprudent for an NSP; and
- The WATMI is higher if NSW firms, which have been recently privatised, are excluded. Following the sale of those networks, the businesses refinanced their debt and did so by constructing portfolios of staggered maturities of debt. As the tranches of shorter-term debt mature, it can be expected that they will be replaced by longer-term debt such that following a period of transition the NSW businesses will hold debt with an average maturity that is very close to 10-years. This may well be a partial explanation for the growth in the WATMI observed in Table 4 above. The snapshot of the WATMI at the present time reflects the transition to steady-state debt portfolios dominated by long-term debt that these businesses are undergoing. The current WATMI does not recognise the long-term debt portfolios that the businesses are transitioning to, post-sale.

ENA submits that:

- Subordinated debt should be included in the analysis. This would be internally consistent as the AER has historically included subordinated debt when setting benchmark gearing. Dr Lally also supports this position (see below); and

- The short-term debt that is issued temporarily as part of transaction financing should be excluded from the analysis for the reasons set out above.

In relation to the inclusion of subordinated debt, ENA notes that Dr Lally has advised the AER that:

> *The ENA (2020b, para 28) argues that the average DRP in the EICSI data should include subordinated debt because it includes the senior debt that the excluded subordinated debt supports. If the EICSI data were being used to directly set the allowed DRP for the regulated businesses, I would agree, otherwise use of the average DRP in the EICSI data to generate the allowed DRP for regulated businesses would fail to match the costs of these businesses in aggregate.* [36]

Consequently, ENA submits that the WATMI currently indicates that networks, on average, issue debt with a 10-year term.

What if the WATMI were to differ more materially from 10 years?

The WATMI is a useful measure of industry average tenor issuance strategy. If the WATMI is close to 10 years, as it currently is, there is no reason for the AER to consider a change to the benchmark tenor. However, even if the WATMI were materially different to the 10-year benchmark this need not imply a change in the benchmark is appropriate.

The WATMI is a measure of the average tenor at issuance for the industry but a focus on the WATMI alone obscures the range of debt issuance practices followed. These will vary across networks based on their specific circumstances and also their equity owners' preferences. The WATMI does not represent the only practice of networks and, indeed, no individual network is likely to have an average tenor exactly equal to the WATMI. The AER's benchmark tenor need not, and should not, be mechanistically set equal to this particular, or any other, measure of the average tenor.

The selection of the benchmark tenor must have regard to the range of observed efficient debt management practices and must reflect a balance of considerations. These considerations include: allowing networks to manage refinance risk, managing the volatility of debt compensation paid by customers and also minimising regulatory complexity associated with transitioning between benchmark tenors. Some networks currently seek to closely replicate the 10-year staggered maturity debt strategy that underpins the AER's current regulatory allowance. However, there are a number of reasons why a network might depart, from time to time or for some period, from the benchmark efficient approach that underpins the AER's current allowance:

- **Temporary responses to periods of market dislocation -** The issuance of shorter-term debt can occur as a temporary response to market dislocation. As noted above, it is common for Australian networks to adopt a 10-year debt target as part of their financing policy. But this does not mean that these firms always issue debt with precisely 10 years maturity. Firms will sometimes issue shorter/longer-term debt and then seek to lengthen/shorten the average term back to 10 years by issuing longer-term debt.
- **Transaction related requirements -** Shorter-term debt might also be issued as a temporary component of the financing package required when a network is privatised or sold to a new owner. In practice, it is not feasible to finance a transaction with 'steady state' long-term debt from the

[36] Lally, M. August 2012, *The risk free rate and the present value principle*, p. 51.

outset, so it is common to secure bridging debt to make the bid unconditional. After financial close, the firm can then begin to out in place a more permanent longer-term debt structure. The same can apply to an existing firm that secures debt finance for a major capital project.

In practice, individual networks are also free to employ whatever debt financing practice they choose, including practices that the regulator might consider to be inefficient. Under incentive-based regulation, the individual network bears all of the risks associated with any such departure from the benchmark efficient approach. Consumers only ever pay in accordance with the costs that are deemed by the AER to be efficient.

To illustrate this, consider an example where a regulator determines that the prudent and efficient approach involves the issuance of 10-year debt. Also suppose that a number of networks adopt precisely that practice, but that some networks issue shorter-term debt, departing from the efficient benchmark. If interest rates rise steeply then a network with shorter term debt will see their costs rises faster than their compensation as more than the benchmark assumed amount of debt is refinanced at higher interest rates (and vice versa). Such departures may be part of a deliberate strategy of a network to adopt a more aggressive financing practice and to bear the entirety of the risk associated with that practice.

In summary, there are at least three reasons why a network might issue debt with a term different to the 10-year benchmark:

- **Temporary responses to periods of market dislocation** - As part of a debt issuance strategy that preserves the 10-year benchmark on average (e.g. shorter-than-target debt might be issued during periods of market disruption, with longer-than-target debt being issued at other times);
- **Transaction-related transition to matching benchmark** - After a recent transaction, or in relation to a major capital project, as the network transitions towards a 10-year trailing average portfolio; or
- **Business-specific departure from benchmark** - As part of a deliberate debt strategy that involves the network weighing up potential benefits against the additional risk that they would bear – these decisions may, or may not, be regarded as efficient by other parties with different risk appetites.

The fact that some combination of the above causes some firms to issue tenors different to 10 years, and therefore, the WATMI to be different to 10 years, need not imply that the regulatory benchmark of 10 years is inappropriate.

6.4 The benchmark efficient form of debt (trailing average)

In its 2013 Rate of Return Guideline, the AER adopted a 10-year trailing average allowance because it considered that approach to best reflect the efficient financing practice:

> *This approach means that the allowed return on debt **more closely aligns with the efficient debt financing practices** of regulated businesses.*[37]

ENA notes that the practice of issuing long-term debt on a staggered maturity basis is the standard approach adopted by firms with long-lived capital assets. The AER noted that its 10-year trailing average approach is consistent with this efficient debt financing practice:

[37] AER, December 2013, *Final Rate of Return Guideline: Explanatory Statement*, p. 12, emphasis added.

> *We propose to apply a trailing average portfolio approach to estimate the return on debt. This approach means that the allowed return on debt more closely aligns with the efficient debt financing practices of regulated businesses and means that prices are likely to be less volatile over time. The trailing average would be calculated over a ten year period. The annual updating of the trailing average should also reduce the potential for a mismatch between the allowed return on debt and the return on debt for a benchmark efficient entity.*[38]

ENA supports the AER's preferred position of maintaining the trailing average approach to the return on debt. [39]

6.5 Implications of a change to the term of debt

Departure from commitment on term

The AER has previously committed to retain the 10-year benchmark term for the duration of the transition to the trailing average approach:

> *In moving to a trailing average approach w**e consider that we are committing to a debt term for the period nominated. To change the benchmark debt term in response to updated debt portfolio information would not be conducive to regulatory stability.***[40]

Victorian gas distribution businesses, for example, will not finish transitioning to the trailing average until 2028. Consequently, a change in the benchmark term part-way through the current transition period would not promote regulatory predictability.

ENA submits that the 10-year trailing average approach remains the efficient debt financing practice, and that this approach should be retained.

Complex transition arrangements

Complex transition arrangements would be required if the AER decided to set the term of debt in each RoRI equal to the WATMI observed over the previous few years. Specifically, this would require each network to embark on a new transition arrangement in every determination.

For example, networks are currently in the midst of a transition to the 10-year trailing average approach that the AER deemed to be efficient in its 2013 Guideline and 2018 RoRI. If the AER were to change the assumed term in its 2022 RoRI, networks would have to begin transitioning to the new regulatory benchmark after their next determination. This transition approach would take 10 years – until the last tranche of the current 10-year debt had expired.

If the AER then changed the benchmark term again in its 2026 RoRI, based on the updated WATMI at that time, another transition to the new term would begin.

Thus, each network would have three transitions partly completed at any point in time.

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[38] AER, December 2013, *Final Rate of Return Guideline: Explanatory Statement*, p. 12, emphasis added.
[39] AER, September 2021, *Term of the rate of return & Rate of return and cashflows in a low interest rate environment: Final Working Paper*, p. 11.
[40] AER, 2013, *Rate of Return Guideline Explanatory Statement*, p. 137, emphasis added.

The unfortunate result of this potential complexity would be:

- Departure from the objective of the RoRI setting a single clearly applied benchmark rate of return calculated on a consistent basis; and
- A lack of transparency and clarity for stakeholders around the underlying basis for the allowed returns of individual firms.

An alternative to this set of complex transitions would be for the AER to only change its approach to setting the allowed return on debt when there was clear and sustained evidence that the benchmark debt financing approach, on which that allowance is based, could no longer be considered to be prudent and efficient.

By way of analogy, the AER considers gearing over 5-year and 10-year periods to reflect the fact that a firm with 60% target gearing may have actual gearing above or below 60% from time to time. It would be complex and disruptive and provide no benefit for the AER to switch its gearing assumption from time to time – because the market cost of capital depends on target gearing rather than spot gearing at a point in time. Similarly, a firm with a target debt maturity of 10 years might have an actual average debt maturity above or below 10 years from time to time. It would be even more disruptive for the AER to vary its term of debt assumption from time to time as that would create great complexity in terms of transition mechanisms.

ENA submits that there is no clear evidence that an infrastructure service provider issuing 10-year debt on a staggered maturity basis could now be considered to be inefficient. In this regard, ENA notes that it is standard for infrastructure companies to issue long-term debt (10 years or more) on a staggered maturity basis.

Sensitivity of average term estimates: avoiding the tail wagging the dog

The *Final Omnibus* paper also notes that the average term of instruments in the EICSI is influenced by a small number of networks raising short-term debt:

> *We also note that the average term of instruments in the EICSI is influenced by a few service providers raising shorter term debt. We do not consider it appropriate to make an adjustment to the benchmark for something driven by the practices of a small number of service providers.*[41]

This highlights the question of whether the AER should set the regulatory allowance on the basis of what it considers to be the benchmark efficient practice or on the basis of the observed actual practice.

ENA considers that the AER should determine what it considers the efficient benchmark to be and set the regulatory allowance accordingly. Individual networks should be free to adopt or depart from the benchmark approach as they see fit. All of the costs and benefits of any departure would fall entirely on the network and have no impact whatsoever on the prices paid by consumers.

[41] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 85.

Recommendation 3: Maintain 10-year trailing average approach

The AER should maintain its 10-year trailing average approach to the allowed return on debt. This approach is consistent with efficient financing practice and with the observed practice of regulated networks, and it avoids a complex transition mechanism being implemented before the existing transition is complete.

7 The term for the allowed return on equity

Key messages

The critical issue at stake

- The Concurrent Evidence sessions highlighted two potential views about the term of the risk-free rate:
  - One view is that the allowed return on equity should be set to match the market cost of equity capital. If the observed market practice is to use a 10-year risk-free rate, the regulatory allowance should also be based on a 10-year rate. Matching the regulatory allowance with the market cost of capital achieves NPV=0.
  - The alternative view is that investors should use a 5-year risk-free rate because they should value regulated assets as the present value of (a) the regulatory allowances over the 5-year regulatory period, plus (b) the end-of-period RAB. Since no cash flows beyond year 5 are required for this exercise, a 5-year discount rate would be appropriate.
- This raises the question of whether the regulator should:
  - Consider the approach that investors do adopt, based on evidence of market practice; or
  - Consider the approach that Dr Lally says investors should adopt, based on his assumptions and derivations.
- The standard market practice is to use a 10-year risk-free rate, including for assets regulated by the AER. Market participants use a long-term rate because the relevant assets produce cash flows over a long term. They do not use a 5-year risk-free rate because the strong assumptions that are required to motivate that approach do not apply in practice.

Relevant context and the bar for change

- The possibility of a change in the term of the risk-free rate, from 10 years to 5, would have to be considered in the following context:
  - The AER has considered this issue several times before (2009, 2013 and 2018 rate of return reviews) and has adopted a 10-year risk-free rate in every one of its decisions to date.
  - In its 2018 review, the AER considered the NEO and NGO through the lens of the NPV=0 principle and concluded that a 10-year risk-free rate was appropriate.
  - In its 2018 review, the AER also noted that a 10-year term:
    - Reflects the actual practices of investors, including investors in regulated assets. ENA has submitted extensive evidence on this, including the recent independent expert reports prepared for the Spark and AusNet transactions;
    - Is more consistent with the theory of the SL CAPM; and
    - Best reflects well accepted academic literature.
  - A 10-year risk-free rate (or longer) is standard regulatory practice.
  - A 10-year risk-free rate (or longer) is standard commercial practice. Notably a 10-year rate was adopted in the two recent transactions that involve businesses regulated by the AER.
  - A 10-year risk-free rate (or longer) is recommended by leading textbooks, including Australian and international regulatory textbooks.

- In this context, it would seem reasonable to require a high bar for such a change. The current approach would only be changed if the AER were very sure that standard regulatory and commercial practice, and previous AER analysis of the issue, was wrong.
- However, the AER has not identified *any* new evidence to support a change in approach. The same consultant has provided the same advice to the AER since its inception.
- The most recent regulatory precedent where this issue was fully evaluated is the 2021 decision by the QCA to change from a 'term-matching' approach to a 10-year term based on observed market practice.

The case for a 5-year term

- The argument in support of a 5-year term is based on a set of assumptions that underpin a set of algebraic derivations. These derivations establish only that there must be a match between the return that the regulator allows and the return that investors require.
- Support for a 5-year term appears to be based on the notion that the CAPM (or finance theory more generally) requires that investors should use a 5-year term when valuing the cash flows from a regulated asset. [42]
- However, a move to a 5-year term for equity would be inconsistent with finance theory. Such a change would be based on the assumption that investors have no regard to reinvestment opportunities when developing their investment portfolios. That is, they have no regard to 'what comes next' after each 5-year regulatory period, which is inconsistent with asset pricing theory since Merton (1973).
- ENA submits that the case for a 5-year term falls well short of any reasonable threshold at this time.

7.1 Overview, context, and the threshold for change

The *Information Paper* keeps open the possibility of a change to the term of the risk-free rate – from 10 years to 5. Such a change would have to be considered in the following context:

- The AER has considered this issue several times before (2009, 2013 and 2018 rate of return reviews) and has adopted a 10-year risk-free rate in every one of its decisions to date.
- In its 2018 review, the AER considered the NEO and NGO through the lens of the NPV=0 principle and concluded that a 10-year risk-free rate was appropriate.
- In its 2018 review, the AER also noted that a 10-year term:
  - Reflects the actual practices of investors, including investors in regulated assets;
  - Is more consistent with the theory of the SL CAPM; and
  - Best reflects well accepted academic literature.
- A 10-year risk-free rate (or longer) is standard regulatory practice.

[42] For example, Lally (2021, p. 8) states that the term of the discount rate should match the term of the regulatory period "in accordance with the CAPM."

- A 10-year risk-free rate (or longer) is standard commercial practice. Notably a 10-year rate was adopted in the two recent transactions that involve businesses regulated by the AER and the NSG has advised the AER that real-world investors use a 10-year risk-free rate.
- A 10-year risk-free rate (or longer) is recommended by all leading textbooks.
- The AER's allowed return on equity is already below that of other regulators and commercial estimates of the market cost of equity.[43] Shortening the term of the risk-free rate would only serve to exacerbate that differential.
- No stakeholder has advocated for a change in the term for the required return on equity.

In this context, it would seem reasonable to require a high bar for change. The current approach would only be changed if the AER was very sure that standard regulatory and commercial practice, and previous AER analysis of the issue, was wrong. ENA suggests that it would require compelling new evidence for the standard practice to be abandoned.

However, the AER has not identified *any* new evidence to support a change in approach. Dr Lally has provided the same recommendation on this point to the AER since its inception.[44] Rather, there is now even more evidence that the standard regulatory and commercial practice is to use a 10-year term.

7.2 The key issue is whether a 5-year or 10-year risk-free rate should be used

ENA acknowledges that the SL-CAPM will be used to determine the allowed return on equity in the 2022 RoRI. Within this context, the draft working paper considers two approaches for estimating the risk-free rate parameter – the yield on 5-year and the yield on 10-year government bonds.[45]

Having determined the term of the risk-free rate, the market risk premium must be estimated in an internally consistent manner. For example, if a 10-year risk-free rate is adopted, the MRP must be estimated as the premium to that same 10-year risk-free rate. ENA agrees with the AER's observations on this point:

> *We note that if we were to change the term of equity, the estimation of the MRP parameter may be affected. This was noted in a number of expert reports and is because the estimation of historical excess returns and dividend growth model outputs require the use of a risk-free rate estimate. Matching to the length of the regulatory period would entail the use of a five-year risk free rate (compared to the current use of a ten-year rate) which would typically increase the resulting MRP estimate.*[46]

The equity beta parameter is independent of the term that is adopted for the risk-free rate. To be clear, it is econometrically appropriate to estimate beta using historical periods that are independent of the term

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[43] See section 2.3 above.
[44] AER, September 2021, *Term of the rate of return & Rate of return and cashflows in a low interest rate environment: Final Working Paper*, p. 49.
[45] AER, September 2021, *Term of the rate of return & Rate of return and cashflows in a low interest rate environment: Final Working Paper*, p. 24.
[46] AER, *Term of the Rate of Return: Draft Working Paper*, May 2021, p. 44. On this point, the AER also refers to the GasNet Decision of the Australian Competition Tribunal at pp. 12-13. See also AER, September 2021, *Term of the rate of return & Rate of return and cashflows in a low interest rate environment: Final Working Paper*, p. 59.

adopted for the risk-free rate. This is because of the data limitations and potential noise arising from the use of smaller datasets when estimating beta.

Thus, the key issue to be determined is the term of the risk-free rate, which must then be used consistently when determining the allowed MRP.

7.3 The AER has consistently adopted a 10-year risk-free rate, in line with NPV=0, the NEO and the NGO

The AER has always adopted a 10-year risk-free rate

Stability and predictability of the regulatory approach is valued by all stakeholders, but does not supplant the overriding objective of setting the allowed return to best reflect the market cost of capital. In this regard, ENA notes that the AER has adopted a 10-year risk-free rate in every decision it has made to date, citing consistency with market practice as one of the reasons for adopting that term. The AER affirmed its use of a 10-year risk-free rate in its:

- 2009 Statement of Regulatory Intent;
- 2013 Rate of Return Guideline; and
- 2018 Rate of Return Instrument.

A 10-year risk-free rate is consistent with the NPV=0 principle and the NEO and NGO

The AER's draft working paper suggests that one possible rationale for change in this area is a new focus on the regulatory concept of NPV=0. This would be an understandable reason for renewed focus on this area, and close review of alternative approaches, were NPV=0 considerations absent from past AER decisions in this area. However, this consideration was central to the 2018 RoRI, where the AER specifically considered the issue through the lens of the NPV=0 principle, and concluded that a 10-year term best promoted the NEO and NGO.

In particular, the 2018 RoRI confirmed that the AER's approach is to set the allowed return on capital in a way that is consistent with the NPV=0 principle:

> *As the regulatory regime is ex-ante, we consider **a rate of return that meets the objectives must provide ex-ante compensation for efficient financing costs. This is a zero net present value (NPV) investment condition**, which is described as follows:*
>
> > *The zero NPV investment criterion has two important properties. First, a zero NPV investment means that the ex-ante expectation is that over the life of the investment the expected cash flow from the investment meets all the operating expenditure and corporate taxes, repays the capital invested and **there is just enough cash flow left over to cover investors' required return on the capital invested**. Second, by definition a zero NPV investment is expected to generate no economic rents. Thus, ex-ante no economic rents are expected to be extracted as a consequence of market power. The incentive for investment is just right, encouraging neither too much investment, nor too little.*

> *During the first concurrent evidence session, the experts agreed that setting an allowed return to achieve a zero NPV outcome achieves efficient investment incentives, and is in the long term interest of consumers.*[47]

That is, in the 2018 RoRI, the AER viewed its compliance with the NEO and NGO through the lens of the NPV=0 principle and set the allowed return on equity in a way that it considered to be consistent with the NPV=0 principle.

Within that context, the AER concluded that a 10-year risk-free rate should be adopted:

> *Our final decision is to maintain use of a 10 year term for the risk free rate.* ***We consider the use of a 10 year term will lead to an overall rate of return that will better contribute to the achievement of the NEO and NGO****. We consider a 10 year term is* ***consistent with the theory of the Sharpe-Lintner CAPM*** *which is a single period equilibrium model, estimating the returns an investor requires over a long-term investment horizon.* ***The 10-year term also reflects the actual investor valuation practices and academic works****.*[48]

That is, the reasons for the AER's adoption of a 10-year term include:

- Viewed through the lens of the NPV=0 principle, a 10-year term best contributes to the achievement of the NEO and NGO;
- A 10-year term is more consistent with the theory of the SL CAPM;
- A 10-year term reflects the actual practices of investors; and
- A 10-year term best reflects well-accepted academic literature.

In relation to consistency with the theory of the SL CAPM, the AER explained that the standard approach is to adopt a term that reflects the life of the assets:

> *We use the CAPM to estimate how an investor will value the potential returns from an investment in an infrastructure business with long-lived underlying assets. Equity investors seek out efficient returns for their diversified investment portfolio over long-term investment horizons. Although reinvestments may be [made] more frequently, they are still being made with reference to a long-term equilibrium rate of return. This will reflect the excess return required for bearing the systematic risk of the investment over the return on a long-term riskless asset.*[49]

The AER then noted that the standard approach adopted by market practitioners, and advocated in the academic literature, is a 10-year term:

> *We find* ***support for using a 10 year term in actual investor valuation practices****, and academic works. The 2013 and 2017 KPMG market practitioner surveys indicate around 85 per cent of practitioners use 10 year CGSs as a proxy for the risk free rate. Academic works by Pratt & Grabowksi (2010), and Damodoran (2008) also argued that* ***10 year CGS yields were appropriate proxies for the risk free rate, as they reflect the long-term nature of the underlying assets****.*[50]

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[47] AER, December 2018, *Rate of Return Instrument Explanatory Statement*, p. 35, emphasis added.
[48] AER, December 2018, *Rate of Return Instrument Explanatory Statement*, p. 126, emphasis added.
[49] AER, December 2018, *Rate of Return Instrument Explanatory Statement*, p. 127.
[50] AER, December 2018, *Rate of Return Instrument Explanatory Statement*, p. 127, emphasis added.

The AER also concluded that a 10-year term would produce a valuation that is consistent with investor market valuations of similar stocks:

> *We consider that setting a rate of return using a 10 year term will provide for allowed returns on an investment in a regulated business that are comparable with the investor valuations of other stocks within the market with a similar degree of systematic risk.* [51]

It is important to observe that the AER defines NPV=0 in the sense that:

> *there is just enough cash flow left over to cover **investors' required return** on the capital invested* [52]

and that the AER has observed that:

> *We find support for using a 10 year term in **actual investor valuation practices*** [53]

and that:

> *setting a rate of return using a 10 year term will provide for allowed returns on an investment in a regulated business that are comparable with the **investor valuations** of other stocks within the market with a similar degree of systematic risk.* [54]

That is, the adoption of a 10-year risk-free rate, reflecting the approach that investors take when determining their required return on long-lived investments, is consistent with the AER's definition of the NPV=0 principle and (viewed through the NPV=0 lens) the AER has concluded that this contributes to best achieving the NEO and NGO.

ENA agrees with the AER's analysis of the term of the risk-free rate in the 2018 RoRI, as summarised above. We explain below why the reasons for the AER's previous rejection of the arguments in favour of a 5-year term remain valid.

7.4 The framework for the AER's previous decisions: Set the regulatory allowance to match the market cost of capital

ENA have noted above that a key rationale for the AER's adoption of a 10-year risk-free rate is the need to set a regulatory allowance that is consistent with the market cost of capital.

This principle of setting the allowed return equal to the required return in the market is important because:

- Setting the allowed return equal to the required return in the market creates the proper incentive for efficient investment in the regulated asset:
  - Setting the allowed return lower than the required return creates a disincentive to invest as the firm is unable to pay the return that investors require; and
  - Setting the allowed return above the required return creates an incentive for inefficient investment as the firm is able to pay investors a return above what they require; and

[51] AER, December 2018, *Rate of Return Instrument Explanatory Statement*, p. 127.
[52] AER, December 2018, *Rate of Return Instrument Explanatory Statement*, p. 35, emphasis added.
[53] AER, December 2018, *Rate of Return Instrument Explanatory Statement*, p. 127, emphasis added.
[54] AER, December 2018, *Rate of Return Instrument Explanatory Statement*, p. 127, emphasis added.

- Setting the allowed return equal to the required return in the market creates the proper incentive for efficient operation of the regulated assets:
  - Setting the allowed return lower than the required return creates an incentive to extract 'savings' from the operation of the regulated assets in the short run; and
  - Setting the allowed return above than the required return blunts the incentive to operate the regulated asset efficiently in that excess allowed returns can be used to cover inefficient expenditure, while still providing investors with the returns that they require.

The AER reached a similar conclusion in its 2018 RoRI, noting that the Revenue and Pricing Principles (RPP) include reference to the incentives for efficient investment in, and utilisation of, energy networks:

> *Regard should be had to the economic costs and risks of the potential for under and over **investment** by a regulated service provider in the relevant system.*
>
> *Regard should be had to the economic costs and risks of the potential for under and over **utilisation** of the relevant system.*[55]

The AER went on to note that setting the allowed return too low would lead to inefficient underinvestment and overutilisation of assets, and vice versa if the allowed return was set too high.[56]

The AER concluded that market data has a core role in balancing the principles set out in the RPP as a means of best promoting the NEO and NGO.

Market data is particularly important because it provides insights into the actual returns that real-world investors require from capital invested in networks. Thus, market data is important in determining whether a particular regulatory allowance is likely to incentivise over- or under-investment and utilisation of regulated assets:

> *Because the market for capital finance is competitive, an efficient service provider is expected to face competitive prices in the market for funds. Therefore, we consider **efficient financing costs are reflected in the prevailing market cost of capital** (or WACC) for an investment with a similar degree of risk as that which applies to a service provider in respect of the provision of regulated services. As Alfred Kahn stated, 'since the regulated company must go to the open capital market and sell its securities in competition with every other would-be issuer, there is clearly a market price (a rate of interest on borrowed funds, an expected return on equity) that it must be permitted and enabled to pay for the capital it requires'.*
>
> *We consider employing a rate of return that is commensurate with the prevailing market cost of capital (or WACC) is consistent with the zero NPV investment condition (see above). **We also consider economic efficiency more generally is advanced by employing a rate of return that reflects rates in the market for capital finance.** Similarly, Partington and Satchell interpret efficient financing costs as the opportunity cost of capital, which is **a market rate of return** for assets with a given level of risk.* [57]

The Independent Panel in the 2018 review process drew the AER's attention to the fact that the RPP includes reference to the efficient level of investment in regulated assets, but also to the efficient level of

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[55] AER, 2018, *Rate of Return Instrument, Final Decision, Explanatory Statement*, p. 30, emphasis added.
[56] AER, 2018, *Rate of Return Instrument, Final Decision, Explanatory Statement*, pp. 30-31, emphasis added.
[57] AER, 2018, *Rate of Return Instrument, Final Decision, Explanatory Statement*, p. 33, emphasis added.

utilisation of regulated assets. In response to this observation, the AER noted that efficient investment and efficient utilisation are essentially opposite sides of the same coin:

- If the allowed return is set too high, there is an incentive for over-investment in networks and prices would be higher than the efficient cost such that networks will tend to be under-utilised; and
- If the allowed return is set too low, there is an incentive for under-investment in networks and prices would be lower than the efficient cost such that networks will tend to be over-utilised:

> *We agree with the Independent Panel that achieving the legislative objectives requires more than just efficient investment in energy networks, but also requires efficient use of energy network services. An allowed rate of return that is too high (low) will, all else equal, contribute to prices that are too high (low). This effect on prices may discourage (encourage too much) use of network services. It may also encourage consumers to overinvest (underinvest) in downstream investments, such as upgrading to more energy efficient appliances. It may also encourage (discourage) disconnection from the grid and investment in stand-alone power systems. For business consumers, the effect on energy network prices may be passed through to the prices of other goods and services, creating further distortions to efficiency in downstream markets.* [58]

This led the AER to conclude that the RPP and NEO and NGO are best promoted by setting the allowed return to be commensurate with the efficient cost of capital – the return that real-world market investors require from an investment in regulated assets:

> *In this context, for the allowed rate of return to contribute to the achievement of the legislative objectives* ***it should reflect the efficient cost of capital****. If it does, then it will (all else equal) promote both efficient investment in, and efficient use of, energy network services.*
>
> *An allowed rate of return that reflects the* ***efficient market cost of capital*** *will promote both* ***investment and consumption efficiency****.* [59]

ENA agrees that the RPP and NEO and NGO are best promoted by setting the allowed return to be commensurate with the efficient market cost of capital – the return that real-world market investors require from an investment in regulated assets.

The AER remains of the view that the appropriate objective is to set the allowed return equal to the required return in the market. For example, the AER has recently endorsed that approach in its paper on the long-term interests of consumers:

> *Due to inevitable uncertainty, there is a risk that the estimated, expected rate of return will be higher or lower than the market cost of capital.*
>
> *If the expected rate of return deviates from* ***the market cost of capital*** *then the expected rate of return may not achieve the legislative objectives - it may not promote efficient investment in and use of the service provider's energy network for the long term interests of*

[58] AER, 2018, *Rate of Return Instrument, Final Decision, Explanatory Statement*, pp. 39-40.
[59] AER, 2018, *Rate of Return Instrument, Final Decision, Explanatory Statement*, p. 44, emphasis added.

consumers. That is, there may be costs associated with the expected rate of return being higher or lower than ***the market cost of capital****.*[60]

ENA agrees that the allowed return should be set to equal the best possible estimate of the market cost of capital at the time of each decision. Such an approach ensures that network investors receive compensation for their required returns and that consumers pay no more than the efficient cost of the service that is provided to them. As the AER extract explains above, such an approach to setting the allowed return on capital creates the proper incentives for efficient investment in, and efficient utilisation of, energy networks – all of which is in the long-term interests of consumers.

Since there is very clear evidence that real-world market investors determine required returns with reference to a 10-year risk-free rate, that is the approach that should be used to set regulatory allowances.

7.5 A 10-year risk-free rate is recommended by textbooks, including Australian and international regulatory textbooks

The AER has previously noted that a 10-year risk-free rate reflects "academic works." [61]

ENA agrees that the use of a long-term risk-free rate is consistent with the advice from textbooks, including Australian textbooks and international textbooks with a focus on regulated assets.

For example, the leading Berk and DeMarzo (2020) textbook indicates that:

> *When discounting risk-free cash flows we* ***match the maturity of the interest rate to that of the cash flows****. It is common to do the same when applying the CAPM…For example, where valuing a long-term investment with an indefinite horizon, such as a stock, most financial analysts report using the yields of* ***long-term (10-30 year) bonds*** *to determine the risk-free interest rate.*[62]

Similarly, Pratt and Grabowski (2014) state that:

> *For valuations of going-concern businesses and long-term investments made by businesses, practitioners generally use long-term U.S. government bonds as the risk-free security and estimate the ERP in relation to yields on long-term U.S. government bonds. This convention represents two realistic, practical, and simplifying assumptions when valuing a business or a long-term investment: (1) the net cash flows are expected to be realized over an indefinite period of time as there is no expected maturity to a business; and (2) the yields on long-term risk-free bonds are intended to reflect the average yield expected over the long-term maturity.*
>
> *Most businesses have long durations and suffer from a reinvestment risk comparable to that of long-term U.S. government bonds. Buying a business or making a capital investment in a business are both typically long-term investments. Even if the current investor has a relatively short expected holding period, the next investor will "step into his shoes" as owner of a long-term investment. That is, the expected terminal value at the end of the short expected holding period will reflect the long-term maturity of the investment at that point.*

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[60] AER, May 2021, *Assessing the long-term interests of consumers*, p. 8, emphasis added.
[61] AER, December 2018, *Rate of Return Instrument Explanatory Statement*, p. 126.
[62] Berk, J. and P. DeMarzo, 2020, *Corporate Finance: Global 5th edition*, pp. 447-448, emphasis added.

> *The use of long-term U.S. government bonds and an ERP estimated relative to yields on long-term bonds most closely match the investment horizon and risks that confront business managers who are making capital allocation decisions and valuers who are applying valuation methods.*[63]

Australian textbook, Peirson et. al. (2015) also recommends the use of a long-term risk-free rate:

> *The appropriate risk-free rate is the current yield on a government security whose **term to maturity matches the life of the proposed projects** to be undertaken by the company. Since these activities undertaken by the company typically provide returns over many years, the rate on long-term securities is generally used.*[64]

In a textbook that focuses on the setting of allowed returns for regulated infrastructure assets, Morin (2006) also recommends the use of a long-term risk-free rate when implementing the CAPM:

> *To implement the CAPM methodology, an estimate of the risk-free return is required. As a proxy for the risk-free rate, **long-term rates are the relevant benchmarks** when determining the cost of common equity rather than short-term or intermediate term interest rates. There are several reasons for this, both conceptual and practical.*
>
> *At the conceptual level, because common stock is a long-term investment and because the cash flows to investors in the form of dividends last indefinitely, the yield on very long-term government bonds, namely, the yield on 30-year Treasury bonds, is the best measure of the risk-free rate for use in the CAPM and Risk Premium methods. The expected common stock return is based on long-term cash flows, regardless of an individual's holding time period. **Utility asset investments generally have long-term useful lives and should be correspondingly matched with long-term maturity financing instruments.***[65]

In addition, ENA notes that the well-known McKinsey corporate valuation manual also recommends the use of long-term bonds:

> *Use longer-term bonds; they will be better in line with the time horizon of corporate cash flows.*[66]

7.6 A 10-year risk-free rate is the standard practice adopted by market participants

Evidence that a 10-year risk-free rate is standard market practice

The AER has previously noted that a 10-year risk-free rate reflects "the actual investor valuation practices."[67]

This practice is consistent with the view that infrastructure investments, including those subject to regulation, are long-lived investments with a long period over which cash flows are uncertain. It is also consistent with the view that regulated infrastructure investments must compete for equity capital with

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[63] Pratt, S. and R. Grabowski, 2014, *Cost of Capital: 5th edition*, Wiley, pp. 93-94.
[64] Peirson, G., R. Brown, S. Easton, P. Howard, S. Pinder, 2015, *Business Finance: 12th edition*, McGraw Hill, p. 316, emphasis added.
[65] Morin, R., 2006, *The new regulatory finance*, Public Utilities Reports Inc., p. 151, emphasis added.
[66] Koller, T., M. Goedhart and D. Wessels, 2015, *Valuation: 6th University Edition*, Wiley, p. 290.
[67] AER, December 2018, *Rate of Return Instrument Explanatory Statement*, p. 126.

similar unregulated investments, for which the required return is typically based on a 10-year risk-free rate.

ENA agrees that the dominant practice of market practitioners and valuation professionals is to set the term of the risk-free rate to 10 years on the basis that this is the longest easily observable term for Australian government bonds.

Dr Lally has recently advised the AER that:

> *Typical practice in Australia is to use one cost of capital, rather than a cost of capital for each of these future cash flows…The usual choice for that single discount rate typically embodies the ten-year risk-free rate because the cash flows extend to infinity and the ten-year risk-free rate is the longest available term in Australia.*[68]

Consistent with this advice about the Australian market practice being the use of a 10-year risk-free rate:

- A survey of finance executives of large ASX-listed companies by Truong, Partington and Peat (2008) reports that 87% of respondents routinely use a 10-year risk-free rate;[69] and
- The KPMG 2017 Valuation Practice Report[70] sets out the results of a survey of corporations, valuation practitioners, fund managers, private equity and infrastructure investors, and investment bankers. The survey indicates that 85% of respondents adopt a risk-free rate based on the yield on 10-year government bonds. No respondents adopt a risk-free rate based on a shorter-term government bond. The remaining respondents adopt a "house view"[71] that is otherwise unexplained. In addition, more than 80% of respondents agreed that "the risk-free rate should be adjusted to a duration that matches the life of the asset."[72]

In addition, the standard approach used in independent expert valuation reports is to set the risk-free rate equal to the yield on 10-year government bonds. These reports usually contain a statement to the effect that the use of a 10-year term assumption is standard practice among valuation professionals in Australia.

Importantly, independent valuation experts uniformly adopt a 10-year term when determining the risk-free rate for infrastructure assets, including regulated infrastructure assets across a range of different industries.

For example, in its 2021 report for Spark Infrastructure, a firm that owns and operates regulated electricity distribution and transmission networks, KPMG noted that:

> *The risk-free rate of return is the return on a risk-free security, typically for a long-term period. In practice, long dated government bonds are accepted as a benchmark for a risk-free security. In Australia, the spot yield to maturity of 10-year Australian Government Bonds has traditionally been accepted as a proxy for the risk-free rate in determining a cost of equity under the CAPM. Further, the market in 10 year Australian Government Bonds is liquid such that, in our view, the current yield on government bonds represents the best*

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[68] Lally, April 2021, *The appropriate term for the allowed cost of capital*, pp. 18-19.
[69] Truong, G., Partington, G. and M. Peat, 2008, "Cost of capital estimation and capital budgeting practice in Australia," *Australian Journal of Management*, 33, 1, 95-121; Table 7, p. 111.
[70] Available at: https://assets.kpmg/content/dam/kpmg/au/pdf/2017/valuation-practices-survey-2017.pdf.
[71] KPMG, 2017, *Valuation Practices Survey*, p. 10.
[72] KPMG, 2017, *Valuation Practices Survey*, p. 11.

indicator of the risk free opportunity cost of the assets for the forthcoming 10 year period at any particular point in time. [73]

Similarly, in its 2021 report for AusNet Services, another firm that owns and operates network assets regulated by the AER, Grant Samuel noted that:

The risk free rate approximates the yield to maturity on 10 year Australian Government bonds at the end of November 2021. [74]

Grant Samuel has previously explained in its 2014 report for Envestra Ltd, a firm that owns and operates regulated gas distribution networks, that:

The ten-year bond rate is a widely used and accepted benchmark for the risk-free rate. Where the forecast period exceeds ten years, an issue arises as to the appropriate bond to use. While longer term bond rates are available, the ten-year bond market is the deepest long-term bond market in Australia and is a widely used and recognised benchmark. There is a limited market for bonds of more than ten years. In the United States, there are deeper markets for longer term bonds. The 30-year bond rate is a widely used benchmark. However, long term rates accentuate the distortions of the yield curve on cash flows in early years. In any event, a single long-term bond rate matching the term of the cash flows is no more theoretically correct than using a ten-year rate. More importantly, the ten-year rate is the standard benchmark used in practice.[75]

In its 2010 report for Prime Infrastructure, a business that included the DBCT coal terminal regulated by the QCA and WestNet rail regulated by the ERA, Grant Samuel included the passage above and also noted that:

Ten-year bonds are the accepted market benchmarks globally and are typically used as a proxy for the long-term risk-free rate where the forecast period exceeds ten years and there is no liquid market for longer term bonds.[76]

Similarly, in its 2015 report for Energy Developments Ltd, a business that owns and operates a number of unregulated electricity generation assets, Deloitte used the yield on 10-year government bonds on the basis that:

The frequently adopted proxy for the risk-free rate is the long-term Government bond rate.[77]

Moreover, as part of the AER's current consultation process, the Network Shareholders Group[78] has advised the AER that:

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[73] KPMG, October 2021, *Independent expert report for Spark Infrastructure*, p. 101.
[74] Grant Samuel, December 2021, *Independent expert report for Ausnet Services*, Appendix 3, p. 9.
[75] Grant Samuel, March 2014, *Independent Expert Report for Envestra Ltd*, Appendix 3, p. 4.
[76] Grant Samuel, October 2010, *Independent Expert Report for Prime Infrastructure Ltd*, Appendix 1, p. 7.
[77] Deloitte, September 2015, *Independent Expert Report for Energy Developments Ltd*, p. 57.
[78] Consisting of investors who collectively own more than $280 billion of equity in infrastructure assets, including Australian infrastructure assets. Members include Macquarie, IFM, Spark Infrastructure, AMP Capital, Australian Super, Morrison & Co, OMERS, and Caisse de depot et placement du Quebec.

> *Equity investors use a longer term when estimating the cost of equity for long term investments.* [79]

This advice is consistent with earlier advice to the AER provided by Incenta (2013),[80] who also concluded that the dominant commercial practice (including the practice of infrastructure investors) is to use a 10-year term for the risk-free rate:

> *In conclusion, we recommend using a 10-year risk free rate for estimating the cost of equity, and for this rate to be applied consistently to estimate the market risk premium…our view is based on achieving consistency with the practice of valuation professionals for whom the use of a 10-year term for the risk-free rate is widespread, and* ***consistency with our observations of how investors actually value regulated infrastructure assets****.*[81]

In relation to this Incenta report, Dr Lally notes that the independent experts surveyed tended (on average) to adopt a risk-free rate *above* the prevailing 10-year yield.[82] Dr Lally described this revelation as:

> *The sort of prosecution evidence that defence counsels would die for.* [83]

However, it is important to separately distinguish between two issues:

- In relation to the *term* of the risk-free rate, respondents indicated that they use a 10-year term and not a 5-year term; and
- In relation to the *period* over which the 10-year yield is measured, some respondents use a longer period to be consistent with their use of a long-run historical average estimate of the risk-free rate.

There is certainly no suggestion that the market practice might involve a 5-year risk-free rate, or that the Incenta evidence is inconclusive about the *term* that is adopted by market professionals.

In summary, even if the appropriate benchmark is a regulated asset and the appropriate allowed return is one that reflects the impact of regulation itself, the evidence above suggests that investors use a 10-year risk-free rate when determining the required return on *regulated* assets.

The evaluation of evidence must be reasonable and supported by the observable facts

ENA's view is that the evidence that the standard market practice is to adopt a 10-year term is compelling. The attempts to present this evidence as "anecdotal" are mis-informed. [84]

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[79] https://www.aer.gov.au/system/files/NSG%20-%20Term%20of%20the%20Rate%20of%20Return%20Forum%20presentation%20-%2015%20June%202021.pdf, at p.8.
[80] Incenta, June 2013, *Term of the risk-free rate for the cost of equity*.
[81] Incenta, June 2013, *Term of the risk-free rate for the cost of equity*, p. 13, emphasis added.
[82] https://www.aer.gov.au/system/files/Martin%20Lally%20-%20Session%202%20-%20Term%20of%20the%20Rate%20of%20Return%20-%20February%202022.pdf, pp. 3-4 and https://www.aer.gov.au/system/files/Martin%20Lally%20-%20Session%202%20-%20Term%20of%20the%20Rate%20of%20Return%20-%20February%202022.pdf, pp. 28.
[83] https://www.aer.gov.au/system/files/AER%20-%20Concurrent%20Evidence%20Session%202%20-%20Proofed%20Transcript%20-%20February%202022.pdf, p. 28.
[84] https://www.aer.gov.au/system/files/AER%20-%20Concurrent%20Evidence%20Session%202%20-%20Proofed%20Transcript%20-%20February%202022.pdf, p. 28;

In particular, there is no evidence before the AER to support any use of a 5-year rate by any market practitioners, even in relation to firms regulated by the AER.

Moreover, Dr Boyle has suggested that the AER might disregard all of the evidence of market practitioners using a 10-year term on the basis that those practitioners may not be the marginal price setting investor.[85] The approach of disregarding the observed market evidence of one approach, on the basis that the marginal investor might possibly be adopting a materially different approach (for which there is no evidence), is clearly not an approach that a reasonable regulator can consider.

ENA submits that the best available evidence on the term of the rate of return required by the marginal equity investor is the observed practice of actual investors that have committed their equity capital to regulated networks. When valuing their investments in these regulated assets, the existing equity investors assessing whether they should leave their funds invested in the business, or whether they should allocate their funds elsewhere. In order to do that, equity investors estimate the market cost of capital (i.e., the price of capital set by the marginal investor) and apply that estimate as the discount rate in their valuation models.

Equity investors have every incentive to estimate the true market cost of capital as accurately as possible. For instance, if equity investors were to knowingly and systematically over-estimate the true market cost of capital (for instance, by using a 10-year term when the marginal investor was using a 5-year term), then the equity investor would be deliberately under-valuing their equity (all else remaining equal). Under these circumstances, the existing investor would be better off divesting their stake in the regulated business because the marginal investor would be willing to pay more for the asset than the existing investor's own valuation. Hence, there are strong incentives for the actual investors in regulated networks (as there are for any other type of investor) to estimate the market cost of capital accurately.

This means that the AER should have high confidence that the rates of return adopted by actual investors in regulated networks are a reflection of the return required by equity investors.

7.7 A 10-year risk-free rate (or longer) is standard regulatory practice

A 10-year risk-free rate is standard Australian regulatory practice

The AER's draft working paper documents that the only Australian regulator that does not adopt a 10-year risk-free rate for all regulated firms is the ERAWA, which adopts a 10-year rate for rail firms and a 5-year rate for gas networks.[86]

Some Australian regulators previously adopted a 5-year risk-free rate, but have since determined that a 10-year rate would be more consistent with their regulatory task because it better reflects the long-lived nature of the assets and the standard commercial practice. For example, IPART changed to a 10-year risk-free rate in its 2013 WACC Review and has adopted a 10-year rate in all subsequent decisions. In that decision, IPART noted that:

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https://www.aer.gov.au/system/files/Glenn%20Boyle%20-%20Comments%20on%20the%20notes%20-%209%20February%202022.pdf, p.1.

[85] See Dr Boyle's statement at https://www.aer.gov.au/system/files/AER%20-%20Concurrent%20Evidence%20Session%202%20-%20Proofed%20transcript%20-%20February%202022.pdf, p. 29.

[86] AER, May 2021, *Term of the Rate of Return: Draft Working Paper*, Table 1, p. 19. ERAWA adopts different terms for the risk-free rate due to different legislative frameworks for rail and gas regulation.

> *We agree with stakeholder views that increasing the TTM from 5 years to 10 years for all industries is more consistent with our objective for setting a WACC that reflects the efficient financing costs of a benchmark entity operating in a competitive market.*
>
> *Evidence indicates that asset-intensive firms with long-lived assets operating in a competitive market seek to raise debt with a maturity of 10 years or longer. A recent survey by Brotherson et al (2013) on firms' practice in estimating the cost of capital shows that firms and financial advisors unanimously responded that they use bond maturities of 10 years or longer. Further, investors seeking to invest in utilities, whether regulated or unregulated, have investment and financing horizons longer than 10 years.*[87]

Similarly, in its assessment of Queensland Rail's 2020 draft access undertaking, the QCA moved from applying a 5-year term to maturity for estimating the risk-free rate (which it has adopted in previous regulatory decisions) to applying a 10-year term.[88] In making this change, the QCA noted that other regulators have generally accepted the argument that the term of the bond should be a proxy for the life of the regulated asset. It considered that a longer-term bond may also better reflect the expectations of investors, given the long-term nature of infrastructure asset investment.

> *We acknowledge that we have undertaken extensive analysis on term-matching. However, we are no longer convinced that term-matching provides for an overall return on investment that is commensurate with the commercial and regulatory risks involved for regulated entities. As such, we have decided to adopt a 10-year bond term to estimate the risk-free rate, as part of our bottom-up WACC assessment.*[89]

More recently, the QCA has completed its Rate of Return Review, re-confirming that:

> *We consider it is reasonable to use long-term Australian Government bonds based on a 10-year term to maturity. We consider* ***this approach reflects the requirements of investors and lenders who, in relation to long-lived infrastructure assets, will deploy equity over the entire life of the asset, rather than over any given regulatory period****. While we prefer a long-term bond based on the life of the assets, 10 years is the longest-term bond available that is sufficiently liquid.* [90]

The QCA noted the merits of using a longer-term rate, but concluded that it would re-visit that question when liquidity improves:

> *At this stage, we will not use the yields of 30-year bonds to estimate a risk-free rate. However, once we are satisfied that bonds with greater maturity are sufficiently liquid, we will consider using them to estimate the risk-free rate.* [91]

Other Australian regulators adopt similar reasoning for their use of a 10-year risk-free rate. For example, in its 2020 determination for SA Water, ESCOSA noted that a 10-year term was consistent with the long-lived nature of the assets and with the standard commercial approach:

> *[T]he 10-year term to maturity [on CGS for the risk-free rate] approximates the long-lived nature of the infrastructure assets being regulated. It is also in line with the term used by*

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[87] IPART, *Review of WACC Methodology, Final Report*, December 2013, pp. 12-13.
[88] QCA, *Decision – Queensland Rail 2020 draft access undertaking*, February 2020, p. 41-42.
[89] QCA, *Decision – Queensland Rail 2020 draft access undertaking*, February 2020, p. 41-42.
[90] QCA, November 2021, *Rate of return review: Final report*, p. 83, emphasis added.
[91] QCA, November 2021, *Rate of return review: Final report*, p. 84.

regulators and investment practitioners, and accommodates for the relatively limited liquidity of CGS that are well beyond a 10-year term to maturity. [92]

Similar reasoning was also applied by the Industry Panel that was formed to review the ICRC's 2013 decision for Icon Water. The Industry Panel adopted a 10-year term to maturity for both debt and equity on the basis that the term should approximate the life of the assets being financed. It put forward three reasons:[93]

- The efficient debt management practice is to finance long-term assets using long-term debt. Since water utilities largely have long-lived assets, an efficient firm would seek to borrow funds with as long a term-to-maturity as possible to minimise refinancing risk;
- The expected returns on long-lived investments are more closely reflected in long-term bond yields. Evidence shows that asset-intensive firms with long-lived assets operating in a competitive market tend to raise debt with a maturity of 10 years. Financial advisers typically estimate the cost of capital using bond maturities of 10 years or longer. From investors' perspectives, those seeking to invest in asset intensive firms usually have investment and financing horizons much longer than the standard 5-year regulatory period; and
- The term-to-maturity of the risk-free rate used in the calculation of the cost of debt should be consistent with the assumption used when calculating the cost of equity. In this regard, the Industry Panel noted:

  When calculating the cost of equity, companies and financial analysts usually adopt a 10-year government bond yield as the risk-free rate and that the calculation of the MRP is also usually estimated by reference to a 10-year government bond yield. [94]

In all subsequent decisions, the ICRC has followed the Industry Panel and applied a 10-year term for both debt and equity.

International regulators adopt a risk-free term of at least 10 years

The AER's draft working paper documents that international regulators overseas tend to adopt a risk-free rate with a term of at least 10 years.[95] Where longer term government bond yields are available, regulators tend to adopt a risk-free rate with a longer term.

UK regulators use government bonds with terms greater than 10 years as a proxy for the risk-free rate. For example, in its most recent decision, Ofwat considered 10-year and 20-year government bonds:

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[92] ESCOSA, *SA Water regulatory determination 2020 – Final determination: Statement of reasons*, June 2020, p.218.
[93] Industry Panel, *Review of the Independent Competition and Regulatory Commission's 2013 Price Determination for regulated water and sewerage services in the ACT – Draft Report*, December 2014, p.164-165.
[94] Industry Panel, *Review of the Independent Competition and Regulatory Commission's 2013 Price Determination for regulated water and sewerage services in the ACT – Draft Report*, December 2014, p.165.
[95] AER, *Term of the Rate of Return: Draft Working Paper*, May 2021, Table 2, p. 21.

> *We considered evidence from both nominal and RPI linked gilt yields at 10 and 20 year maturities to construct estimates of the risk-free rate at our chosen 15-year investment horizon.* [96]

In its recent review of Ofwat's PR19 decision, the UK Competition and Markets Authority considered a range of evidence with terms between 10 and 20 years:

> *We set the bottom of the RFR estimate range as the 6-month average of the UK 20-yr ILG. We set the top of the range as the 6-month average of the IHS iBoxx £ Non-Gilt AAA 10+ and 10-15 indices.*[97]

In its most recent decision, Ofgem considered a number of government bond yield estimates, all with terms of 20 years, noting that:

> *The CAPM allows us to estimate investor expectations by combining three parameters (the risk-free rate, equity beta, and Total Market Returns). In line with recommendation 2 from the UKRN Study, we estimate each of these three parameters using long-term tenors or long-runs of outturn data.* [98]

In the US, FERC adopts the yield on 30-year US Treasury bonds[99] and STB adopts the yield on 20-year US Treasury bonds.[100]

Recommendation 4: A high bar for change should be applied to the term of the risk-free rate

It is reasonable to apply a high bar for change to the term of the risk-free rate, given that:

- The AER has considered this issue several times before (2009, 2013 and 2018 rate of return reviews) and has adopted a 10-year risk-free rate in every one of its decisions to date.
- In its 2018 review, the AER also noted that a 10-year term (a) Reflects the actual practices of investors, including investors in regulated assets. ENA has submitted extensive evidence on this, including the

[96] Ofwat, *PR19 Final Decision, p. 29.*
[97] UK CMA, *PR19 Final Decision, Paragraph 9.241.*
[98] Ofgem, *RIIO -2 Decision, Paragraph 3.11.*
[99] Brattle, June 2020, *A Review of international approaches to regulated rates of return*, pp. 86, 93.
[100] Brattle, June 2020, *A Review of international approaches to regulated rates of return*, p. 99.

recent independent expert reports prepared for the Spark and AusNet transactions; (b) Is more consistent with the theory of the SL CAPM; and (c) Best reflects well accepted academic literature.

- A 10-year risk-free rate (or longer) is standard regulatory practice.
- A 10-year risk-free rate (or longer) is standard commercial practice. Notably a 10-year rate was adopted in the two recent transactions that involve businesses regulated by the AER.
- A 10-year risk-free rate (or longer) is recommended by leading textbooks, including Australian and international regulatory textbooks.
- No new evidence has been presented in this review.

7.8 The same principle applies to debt and equity: Set the regulatory allowance to match the market cost of capital

In relation to the allowed return on debt, Dr Lally's recent advice to the AER is that:

> *in respect of the cost of debt, satisfying the NPV = 0 principle requires that the allowed cost of debt match that incurred by the benchmark efficient firm* [101]

and that NPV=0:

> *can only occur if the interest rate on debt incurred by the (benchmark efficient) firm matches that allowed by the regulator.* [102]

Dr Lally contemplates a rate-on-the-day allowance whereby the regulatory allowance is set equal to the 5-year spot rate at the time of each regulatory determination. This could be 'matched' by a business that issues all of its debt in a single 5-year tranche at the time of each determination such that the regulatory allowance matches the cost incurred. However, he rules out this approach on the basis that such a debt financing approach is not viable in practice:

> *this is not a viable debt policy for a (private-sector) firm because rollover of all of its debt at the same point in time would significantly expose it to opportunistic pricing by lenders and aberrations in the debt market at this time (debt markets freezing up or rates being freakishly high); all of this is called "refinancing risk."* [103]

ENA agrees with all of this analysis. In particular:

- The regulatory allowance should be set to match the market cost of capital incurred by a network; and
- What is required is a reasonable estimate of the cost that would feasibly be incurred in prudent commercial practice – approaches that would not be adopted in such practice are of no relevance to the setting of regulatory allowances.

ENA considers that these principles apply equally to debt and equity.

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[101] Lally, April 2021, *The appropriate term for the allowed cost of capital*, p. 3.
[102] Lally, April 2021, *The appropriate term for the allowed cost of capital*, p. 23.
[103] Lally, April 2021, *The appropriate term for the allowed cost of capital*, p. 23.

Recommendation 5: The approach to debt and equity should be the same

For equity, like debt, the allowed return should be set to match the market cost of capital.

7.9 An assessment of the bar for change

No basis for change

The material above demonstrates that a change to the term of the risk-free rate would be inconsistent with regulatory and commercial practice, academic literature, and the AER's longstanding practice of using a 10-year term in line with the NPV=0 principle to best support the NEO and NGO.

It would also be inconsistent with the AER's approach to debt, where the regulatory allowance is based on evidence of the returns that commercial market investors actually do require.

In addition, no stakeholders appear to be advocating for a change to the term of the risk-free rate.

Consequently, ENA submits that, in this setting, it would be reasonable to adopt a high bar for change.

The two potential views

During the Concurrent Evidence sessions, all experts agreed that the AER should select the term of the risk-free rate that satisfies the NPV=0 condition. The source of the disagreement between experts on whether a 10-year term or a 5-year term should be used appears to be differences in interpretation about what the NPV=0 condition actually means.

The Concurrent Evidence sessions highlighted two potential views about the term of the risk-free rate:[104]

- One view is that the NPV=0 condition would be satisfied if the AER were to set the allowed return on equity equal to the return on equity actually required by investors when committing capital to a regulated business. In other words, the allowed return on equity should be set to match the market cost of equity capital. This interpretation is entirely consistent with the interpretation of the NPV=0 condition adopted by the AER in previous rate of return reviews, as well as the definition of the NPV=0 principle presented by the AER in the Final Omnibus paper:

  The zero NPV investment criterion has two important properties. First, a zero NPV investment means that the ex-ante expectation is that over the life of the investment the expected cash flow from the investment meets all the operating expenditure and corporate taxes, repays the capital invested and ***there is just enough cash flow left over to cover investors' required return on the capital invested****. Second, by definition a zero NPV investment is expected to generate no economic rents. Thus, ex-ante no economic rents are expected to be extracted as a consequence of market power. The incentive for investment is just right, encouraging neither too much investment, nor too little.*[105]

  If the observed market practice is to use a 10-year risk-free rate, the regulatory allowance should also be based on a 10-year rate. Matching the regulatory allowance with the market cost of capital achieves NPV=0.

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[104] See, for example, AER Chair Clare Savage's summary at https://www.aer.gov.au/system/files/AER%20-%20Concurrent%20Evidence%20Session%202%20-%20Proofed%20Transcript%20-%20February%202022.pdf, pp. 27-28.

[105] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 91, emphasis added.

- The alternative view is that the NPV=0 condition would be satisfied if the allowed return on equity were to be set equal to one (contested) view of the rate of return that equity investors should theoretically require, even if that rate bears no relation to the rate of return that investors in the real world actually require.

  Proponents of this view argue that investors should use a 5-year risk-free rate because they should value regulated assets as the present value of (a) the regulatory allowances over the 5-year regulatory period, plus (b) the end-of-period RAB. Since no cash flows beyond year 5 are required for this exercise, a 5-year discount rate would be appropriate.

This raises the question of whether the AER should:

- Consider the approach that investors do adopt, based on evidence of market practice such as that set out above; or
- Consider the approach that Dr Lally says investors should adopt, based on his assumptions and derivations.

ENA's view is that it would only be appropriate for the AER to depart from the standard commercial and regulatory practice, including its own long-standing practice, if it was very certain that the standard approach of adopted by actual investors in regulated networks of using a 10-year risk-free rate is wrong. ENA notes that the AER has repeatedly received advice (in 2009, 2013 and in 2018) that it should adopt the second interpretation of the NPV=0 condition above, but in every instance the AER has decided to adopt the first interpretation rather than the second.

G. K. Chesterton has famously observed that no one should advocate for a fence to be taken down unless they have a full understanding of why it was constructed. He notes that "*there are reformers who get over this difficulty by assuming that all their fathers were fools.*"[106]

In the Concurrent Evidence process, Mr Partington has observed that:

> *The current regulatory debate is whether to use five-year or ten-year government bonds as a proxy for the risk-free rate. Thus, it is worthwhile to note that, when computing the required return on equity, standard practice in Australia is to use long-term bonds. When computing long horizon required returns, the deep and liquid market make the 10-year government bond rate the standard proxy for the risk-free rate. The AER has also followed this practice. The question, therefore, is whether the argument for change justifies a break with standard practice. I suspect not.*[107]

An overview of the case for a 5-year term

The following section summarises the material that supports the case for a 5-year term. That case is centred around the Lally (2021) report commissioned by the AER.[108] Dr Lally advises that the term of the risk-free rate should be set to 5 years (the length of each regulatory period) to be consistent with the NPV=0 principle.

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[106] See, for example, https://www.goodreads.com/quotes/833466-in-the-matter-of-reforming-things-as-distinct-from-deforming.
[107] Partington, G., February 2021, *Concurrent evidence session: Commentary on Lally's term analysis*, p. 4.
[108] Lally, April 2021, *The appropriate term for the allowed cost of capital*.

Dr Lally has provided the same advice based on the same reasoning to the AER in every rate of return review. This raises the question of whether there is sufficient new evidence to warrant a change in the long-standing approach.

The argument in support of a 5-year term is based on a set of assumptions that underpin a set of algebraic derivations. These derivations establish only that there must be a match between the return that the regulator allows and the return that investors require. Thus, if the required and allowed return are both based on a 10-year risk-free rate, the NPV=0 principle will be satisfied. As it is for the return on debt. And as it would be if both are based on a 5-year risk-free rate.

That is, the derivations only get us to the point where the NPV=0 principle requires that the allowed return must match the required return.

Support for a 5-year term appears to be based on the notion that the CAPM (or finance theory more generally) requires that investors should use a 5-year term when valuing the cash flows from a regulated asset.

The following section shows that finance theory does not require that a 5-year term should be used for regulated assets, which is consistent with the observation that standard market practice does not use a 5-year discount rate.

7.10 The case for a 5-year term

A focus on the Lally modelling in support of NPV=0

The AER's draft working paper set out a number of reasons in support of a 5-year term for the return on equity.[109] ENA has provided detailed responses in our previous submission on this topic.[110] The AER's final working paper focuses on a single reason – purported consistency with the NPV=0 principle. The AER concludes that:

> *the appropriate term for equity should then match the length of the regulatory period. Otherwise, the NPV=0 condition would be violated.* [111]

This conclusion is based on the modelling provided in Lally (2021).[112] Consequently, we focus our response on this modelling.

An overview of the Lally modelling

The modelling in Lally (2021) consists of Equations (1) to (4) set out on pages 7-8 of his report. Those equations pertain to a stylized example of two one-year regulatory periods where the capital invested in the regulated asset has been returned in full at the end of the second period.

Those equations establish *only* that NPV=0 requires that the regulatory allowance must equal the investors' required return. In this regard, Dr Lally notes that:

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[109] AER, May 2021, *Term of the Rate of Return: Draft Working Paper*.
[110] ENA, July 2021, *The term of the rate of return*.
[111] AER, September 2021, *Term of the rate of return & Rate of return and cashflows in a low interest rate environment: Final Working Paper*, p. 50.
[112] AER, September 2021, *Term of the rate of return & Rate of return and cashflows in a low interest rate environment: Final Working Paper*, pp. 49-50.

> *if the allowed cost of equity in the numerator of equation (4) [the regulatory allowance] were larger or smaller than the discount rate in that equation [the investors' required return], the present value of the future cash flows of the business (V_0) would not match the initial investment of A.* [113]

Mr Partington made the same point in a note submitted as part of the Concurrent Evidence sessions:

> *I stress that the calculation of V_0 will always give A as long as discount rate is the same in the numerator and denominator of equation 4. A critical assumption, therefore, is that those discount rates are the current market expected returns. If so V_0 will equal the market value of the allowed cash flows and the NPV = 0 criterion will truly be satisfied. Otherwise, it will not be satisfied.*[114]

That is, Dr Lally's derivations simply establish that the NPV=0 principle requires that the allowed return must match the required return.

Dr Lally then introduces the assumption that it is appropriate to value a multi-period investment via the sequential application of the SL CAPM to each period. In this regard, he states that:

> *In accordance with the CAPM, the one-year cost of equity is the risk-free rate plus the product of the market risk premium and the beta, all defined over the one-year period in question.* [115]

That is, there is an additional assumption that, because the length of each regulatory period is one year in his example, the SL CAPM requires that investors should determine the required return by using a one-year risk-free rate.

Critically, it would be incorrect for the AER to conclude that the four equations presented in Lally (2021) demonstrate that NPV=0 requires term matching. Those equations establish nothing more than that the regulatory allowance must equal the investors' required return, whatever that might be.

The conclusion that the required return matches the length of the regulatory period only comes from the assumption that the SL CAPM requires it. We show below that this assumption is incorrect.

A brief summary of the algebra

Dr Lally's Equation (1) for the value of the firm at time 1 (the end of the first regulatory period) is as follows:

$$V_1 = \frac{E(REV_2)}{1+k_{e12}} = \frac{[A-DEP_1]k_1 + (A-DEP_1)}{1+k_{e12}} = \frac{(A-DEP_1)(1-k_1)}{1+k_{e12}}$$

where Dr Lally uses k to denote the allowed return and k_e to denote the required return.

The RAB at time 1 will equal the initial RAB (A) less depreciation over the first regulatory period:

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[113] Lally, April 2021, *The appropriate term for the allowed cost of capital*, p. 8.
[114] https://www.aer.gov.au/system/files/Graham%20Partington%20-%20Comment%20on%20Lally%27s%20term%20analysis%20-%207%20February%202022.pdf, p. 3.
[115] Lally, April 2021, *The appropriate term for the allowed cost of capital*, p. 8.

$$RAB_1 = (A - DEP_1).$$

Thus, from Dr Lally's Equation (1), the value of the firm at time 1, V_1, will only equal the RAB at that time $(A - DEP_1)$ if the allowed return over the second period equals the investors' required return. That is:

$$V_1 = RAB_1 \; only \; if \; k_1 = k_{e12}.$$

Similarly, in expectation form, the *expected* value of the firm, V_1, will only equal the RAB if the allowed return over the second period is *expected* to equal the investors' required return. That is:

$$E(V_1) = RAB_1 \; if \; E(k_1) = k_{e12}.$$

Dr Lally similarly shows that the value of the firm at time 0, V_0, will only equal the initial RAB (A) if the allowed return over the first period also equals the investor required return. That is:

$$V_0 = RAB_0 \; only \; if \; k_0 = k_{e01}.$$

Dr Lally then concludes that:

> *The NPV = 0 principle requires that* V_0 *=* A*. This can only occur if the allowed cost of capital* k_1 *in the numerator of equation (1) matches the discount rate* k_{e12} *in that equation (which is the one-year cost of equity prevailing at time 1) and the allowed cost of capital* k_0 *in the numerator of equation (2) matches the discount rate* k_{e01} *in that equation (which is the one year cost of equity prevailing at time 0).*[116]

Dr Lally further notes that:

> *By contrast, for example, if the allowed cost of equity in the numerator of equation (4) were larger or smaller than the discount rate in that equation, the present value of the future cash flows of the business (*V_0*) would not match the initial investment of A.* [117]

ENA agrees that for the NPV=0 principle to be satisfied, it must be the case that the regulatory allowance matches the investors' required return. This proof simply restates an uncontroversial and intuitive conclusion that has formed the basis for every rate of return guideline and instrument which the AER has made since its commencement.

Matching the regulatory allowance to the investor required return

ENA considers that the appropriate way of satisfying the NPV=0 principle is to estimate the return that investors actually require and set the regulatory allowance to match it.

That appears to be the approach that has been adopted to the allowed return on debt where Dr Lally advises that:

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[116] Lally, April 2021, *The appropriate term for the allowed cost of capital*, p. 8.
[117] Lally, April 2021, *The appropriate term for the allowed cost of capital*, p. 8.

> *satisfying the NPV = 0 principle requires that the allowed cost of debt match that incurred by the benchmark efficient firm*[118]

and where the AER sets the regulatory allowance such that:

> *the allowed return on debt more closely aligns with the efficient debt financing practices of regulated businesses*[119]

in order to:

> *reduce the potential for a mismatch between the allowed return on debt and the return on debt for a benchmark efficient entity.*[120]

It is not clear why the same logic does not apply to the allowed return on equity – why the AER would not simply estimate the return that equity investors require and set the regulatory allowance accordingly. The evidence on this point (set out above) is abundantly clear – investors determine the required return on equity using a 10-year risk-free rate.

If investors require a return based on a 10-year risk-free rate, and the AER provides a return based on a 10-year risk-free rate, the NPV=0 principle will be fully satisfied.

Moreover, it also follows that if investors require a return based on a 10-year risk-free rate and the AER provides something different, the NPV=0 principle will be violated.

During the Concurrent Evidence sessions, Dr Lally was asked why he considers it appropriate for the discount rate used to value regulated cash flows to reflect a 10-year cost of debt if the use of a 5-year regulatory period requires the use of a five-year cost of equity. This appears to be an inconsistency that requires explanation.

To recap Dr Lally's mathematical example, he considers an unregulated firm that exists for two regulatory periods (each lasting one year), and which has no operating cost, capital costs or tax obligations.

Dr Lally presents the following expression for the expected value of the firm at time 1:

$$V_1 = \frac{E(REV_2)}{1+k_{12}} = \frac{[A-DEP_1]k_1 + (A-DEP_1)}{1+k_{12}} = \frac{(A-DEP_1)(1+k_1)}{1+k_{12}}, \qquad (1)$$

and the following expression for the value of the firm at time 0:

$$V_0 = \frac{E(REV_2)+E(V_1)}{1+k_{01}} = \frac{[Ak_0 + DEP_1]+E(V_1)}{1+k_{01}}. \qquad (2)$$

For simplicity, Dr Lally's example focusses on a firm that is 100% equity-financed.

In a supplementary note dated 14 February 2022, Dr Lally modifies his numerical example to incorporate debt.121 In doing so, he defines V_0 and V_1 to be the value of equity (rather than the value of the whole

[118] Lally, April 2021, *The appropriate term for the allowed cost of capital*, p. 3.
[119] AER, December 2013, *Final Rate of Return Guideline: Explanatory Statement*, p. 12, emphasis added.
[120] AER, December 2013, *Final Rate of Return Guideline: Explanatory Statement*, p. 12, emphasis added.
[121] Lally, M., *Expert session 1: further notes*, 14 February 2022.

firm) at time 0 and time 1, respectively. This allows Dr Lally's modified example to focus exclusively on the cash flows to equity holders.

Under this formulation, the cash flows in the numerator include (amongst other things) a cost of debt allowance, efficient interest payments and a regulatory allowance for debt repayments. Since the allowed return on debt is assumed to equal the interest payments of an efficient business, and since the allowance for the repayment of debt is assumed to match the efficient debt portion of the firm's RAB, all the cash flows related to debt (i.e., interest and principal) in the numerator cancel out, leaving just the cash flows to equity. Dr Lally then discounts these cash flows using the cost of equity to obtain the value of equity invested in the firm.

However, the question at hand is: why treat the return on debt differently to the return on equity? That question is not addressed by restricting the analysis to the valuation of equity alone. It is more instructive to treat V_0 and V_1 as enterprise values, rather than equity values, because in order for the NPV = 0 condition to be truly met, the expected value of the whole firm must equal the opening RAB.

Under that formulation:

- V_1 and V_0 (when defined as enterprise values) must be determined by discounting the regulatory cash flows using an appropriate Weighted Average Cost of Capital (not just the cost of equity) for each period—since the enterprise as a whole is financed using a combination of debt and equity; and
- The allowed rate of return in each regulatory period should reflect an allowed return on debt as well as an allowed return on equity (as per Dr Lally's modified example).

Assuming, as Dr Lally does in his modified example, that the regulator and the firm adopt the same efficient gearing level, G, the general expression for the value of the firm (as opposed to the value of equity) at time 1 may be written:

$$V_1 = \frac{(A - DEP_1)[1 + k_{e1}(1 - G) + k_{d1}G]}{1 + k_{e12}(1 - G) + k_{d12}G}, \qquad (3)$$

where:

- k_{e1} and k_{d1} are the allowed return on equity and allowed return on debt, respectively, in regulatory period 2; and
- k_{e12} and k_{d12} are the cost of equity and cost of debt, respectively, adopted by the investor in regulatory period 2.

It is clear that if $k_{e1} = k_{e12}$, then $V_1 = A - DEP_1$ only if $k_{d1} = k_{d12}$.

If that holds, and once again assuming that the regulator and the firm adopt the same efficient gearing level, then the general expression for the value of the firm (as opposed to the value of equity) at time 0 is:

$$V_0 = \frac{A[1 + k_{e0}(1 - G) + k_{d0}G]}{1 + k_{e01}(1 - G) + k_{d01}G} \qquad (4)$$

where:

- k_{e0} and k_{d0} are the allowed return on equity and allowed return on debt, respectively, in regulatory period 1; and
- k_{e01} and k_{d01} are the cost of equity and cost of debt, respectively, adopted by the investor in regulatory period 1.

It is clear that if $k_{e0} = k_{e01}$, then $V_0 = A$ (i.e., the NPV = 0 condition is met) only if $k_{d1} = k_{d12}$.

Equations (3) and (4) show that the value of the firm (as opposed to the value of equity invested in the firm) depends on the cost of debt. As noted above, in order for the NPV = 0 condition to be truly satisfied, the expected value of the whole firm should equal the opening RAB.

Dr Lally argues that since the regulatory cash flows in his mathematical example are one-year cash flows, a one-year cost of equity should be used to discount those cash flows. That is, the present value is determined without considering any payoffs beyond the end of the current regulatory period.

Should this rule also apply for the cost of debt?

- If a 10-year cost of debt (rather than one with a term that matches the length of the regulatory period) is acceptable, why is it unacceptable to use a 10-year cost of equity in the same present value formula (i.e., equations (3) and (4))?
- According to Dr Lally, the key factor that should determine the term of the discount rate is the frequency with which regulatory allowances are reset. Under the AER's trailing average approach, the return on debt allowance is reset annually. Does this imply that a one-year cost of debt should be used when valuing a firm regulated using an annually-updating return on debt allowance? If not, why not?

ENA's view is that internal consistency and the NPV=0 condition are both maintained by setting the regulatory allowance on the basis of evidence of the returns that investors actually require. This is the approach the AER has consistently followed in the past (e.g., the 2013 Rate of Return Guideline and the 2018 RoRI). The approach of setting the return on debt allowance to reflect the market cost of debt should also apply to equity.

Replacing the return that investors do require with the return that investors should require

The algebra set out in the Lally report (Equations 1 to 4) establishes only that the NPV=0 principle requires that the allowed return equals the return that investors require.

Dr Lally's conclusion that investors in his example would require a one-year rate of return (to match the length of the regulatory period in Dr Lally's example) requires an additional assumption as follows:

> *In accordance with the CAPM, the one-year cost of equity is the risk-free rate plus the product of the market risk premium and the beta, all defined over the one-year period in question.* [122]

That is, there is an additional assumption that, because the length of each regulatory period is one year in his example, the SL CAPM requires that investors should determine the required return by using a one-year risk-free rate.

But there are two problems with this assumption:

- **It is clear that this is not how real-world investors go about determining the returns that they require on infrastructure assets, including regulated infrastructure assets.**

  Rather, the evidence is very clear that the investor required return on equity is based on a ten-year risk-free rate.

[122] Lally, April 2021, *The appropriate term for the allowed cost of capital*, p. 8.

Thus, the proposed approach is to replace an estimate of the return that investors actually do require, with an estimate of the return that they should require – not according to the algebra, but according to the additional assumption that the SL CAPM requires it.

- **There is no basis for this additional assumption. It is well-known that multi-period projects cannot be valued by applying the SL CAPM sequentially to each period.**

  The original SL CAPM which serves as the AER's foundation model is a single-period model that cannot be sequentially applied in a multi-period setting. That is, the SL CAPM does not imply that investors should apply a 5-year version of the CAPM to each regulatory period. Thus, Dr Lally's additional assumption is inconsistent with finance theory.

Finance theory does not imply that investors should apply a 5-year version of the CAPM to each regulatory period

As part of the Concurrent Evidence process, Mr Partington noted that the SL CAPM does not require or imply that investors should apply a 5-year version of the CAPM to each regulatory period. Rather, he noted that the SL CAPM is a one-period model and therefore provides no guidance on the term that should be adopted for a long-lived (multi-period) investment. He notes that that market practice is to apply the one-period CAPM in a multi-period world by adopting a long-term risk-free rate to be consistent with the life of the investment:

> *If we seek guidance from the CAPM about the term structure of equity, we find that there is no term structure for either equity returns, or interest rates, since the CAPM is a single period model. The duration of the single period is undefined in the CAPM, it is the investment horizon assumed to be homogenous across investors. Unfortunately, investors are not in reality homogenous in their investment horizons. However, since equity is generally used as a long-term source of finance, the return on equity is generally considered a long-term rate of return. Given the nature of the underlying assets of the networks and the nature of their investors, for example pension funds, it is almost certain that the investment is made with very long-term rates of return in mind. Therefore, there are grounds to argue for a long horizon in implementing the CAPM.* [123]

In the Concurrent Evidence process, Dr Boyle noted that Fama (1970)[124] has set out the conditions under which it would be appropriate to apply the SL CAPM sequentially each period. But the required set of restrictive assumptions bears such little resemblance to reality that the literature has instead moved on to consider multi-period versions of the CAPM. For example, Constantinides (1980) considers a set of additional assumptions that would permit the SL CAPM to be derived in a multi-period setting but concludes that:

> *The sequential application of the Sharpe-Lintner model in the discounting of stochastic cash flows becomes computationally complex and of little practical use.* [125]

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[123] Partington, G., February 2021, *Concurrent evidence session: Commentary on Lally's term analysis*, p. 4.
[124] Fama, E., 1970, "Multiperiod consumption-investment decisions," American Economic Review, 60, 1,163-174.
[125] Constantinides, G., 1980, "Admissible uncertainty in the intertemporal asset pricing model," *Journal of Financial Economics*, 8, p. 71.

Why are subsequent regulatory periods relevant to the analysis?

In the single-period CAPM, investors maximise the expected utility from their consumption at the end of the single period and the SL CAPM formula is obtained from that maximisation problem.

By contrast, in a multi-period setting, utility is not just a function of the investor's consumption at the end of the period, but also with the investment opportunities that might be available to them for subsequent periods. The availability of these subsequent investment opportunities changes the investor's optimisation problem such that the SL CAPM no longer applies.

Thus, it is not correct to apply the single-period CAPM to a 5-year regulatory period that will be followed by another 5-year period, and another, and so on.

Consider Dr Lally's example of two sequential regulatory periods. Investors do not apply the single-period SL CAPM to the first regulatory period. They do not consider only their utility from consumption at the end of that regulatory period – they also consider the reinvestment opportunities that are available. An investor with relative risk aversion in excess of one will tend to consume less at the end of the first regulatory period if reinvestment opportunities are relatively poor. In simple terms, the investor will recognise that they need to consume less and invest more when expected investment returns are lower.

In this context, application of the single-period CAPM to just the first regulatory period would be inconsistent with finance theory – because it would ignore the important effect of reinvestment over the subsequent period.

If one is constrained to using the single-period CAPM in such a setting, it would make sense to consider a longer period, such that reinvestment opportunities become relatively less important. This is precisely what we observe in market practice.

ENA has previously made submissions on this very point as part of the AER's 2009 WACC Review.[126] For example, the Merton (1973) Intertemporal CAPM,[127] and the significant literature that it has generated, specifically recognises that utility is not just a function of the investor's consumption at the end of the period, but also with the investment opportunities that might be available to them for subsequent periods.

The rationale for adopting a 10-year term has nothing to do with correcting for low-beta bias

During the Concurrent Evidence sessions, it was suggested that perhaps the reason for adopting a 10-year term for the return on equity rather than a 5-year term was to address a "perceived" low-beta bias problem associated with the SL CAPM.

For the avoidance of doubt, ENA seeks to clarify that the rationale for adopting a 10-year term for the return on equity has nothing to do with correcting for low-beta bias. Rather, ENA considers that a 10-year term should be adopted because there is overwhelming evidence that equity investors in regulated energy networks require a 10-year return on equity; therefore, adopting a 10-year term for the return on equity would best satisfy the NPV=0 condition. The relevant evidence, rationale and conclusions in

[126] See, for example, the ENA-commissioned report of Hird, T., B. Grundy and D. Young, September 2008, *Estimation of, and correction for, biases inherent in the Sharpe CAPM formula*, particularly section 4 and appendix A.
[127] Merton, Robert C., 1973, "An intertemporal asset pricing model," *Econometrica* 41, 867-887.

relation to a 10-year term would be unchanged even in the absence of empirical evidence of low-beta bias.

No basis for a 5-year term in finance theory

ENA submits that a move to a 5-year term for equity would be inconsistent with finance theory. Such a change would be based on the assumption that investors have no regard to reinvestment opportunities when developing their investment portfolios, which is inconsistent with asset pricing theory since 1973.

Is the regulatory task different? The 'regulated assets are different' argument

ENA submits that regulators, independent valuation experts, market practitioners and investors are all engaged in the same task – they are all seeking to estimate the rate of return that investors require to commit equity capital to the firm.

Grant Samuel is a firm that has prepared several independent expert reports in the context of transactions involving networks regulated by the AER, including the recent AusNet Services transaction. Grant Samuel has strongly refuted the notion that, when estimating the required return on equity, it is engaged in a different task to that being performed by the AER:

> *The AER also seeks to distinguish discount rates for valuations from discount rates for regulatory purposes by the fact that valuations have a perpetuity timeframe (and must reflect expectations of investors over that timeframe) while the regulator sets the return on equity only for the length of that regulatory period (typically five years). We do not believe this distinction is valid. For a start, the AER adopts a 10 year term for its overall rate of return (page 3-25) including a 10 year risk free year rate so if the five year timeframe of the Draft Decision was paramount then its own methodology is inconsistent with the return objective. In any event, it is our view that the relevant period is always a perpetuity, even in the context of a five year regulatory period. The rate of return over the five year period can only be realised if the capital value is sustained at the end of the period. The sustainability of the capital value at the end of year five is in turn dependent on cash flows beyond year five (i.e. the cash flows in perpetuity).* [128]

That is, it is not the case that practitioners have not properly considered the possibility that regulated assets are different from other assets. Rather, practitioners recognise that the value of the asset at the end of the regulatory period is not known for sure, but rather depends on all subsequent cash flows. Thus, there is a long-run series of uncertain cash flows, which determines the return that is required.

Term matching for every cash flow

Finally, suppose that we adopt Dr Boyle's suggestion[129] that:

- Each cash flow really should be discounted using a rate that matches its term; and
- The allowed return should be based on a 5-year term.

In this case, the valuation formula would be as follows:

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[128] Grant Samuel, January 2015, *Grant Samuel response to AER Draft Decision*, p. 5.
[129] https://www.aer.gov.au/system/files/Glenn%20Boyle%20-%20Comments%20on%20the%20notes%20-%209%20February%202022.pdf.

$$V_0 = \frac{Ak_{e,5}}{\left(1+k_{e,1}\right)^1} + \cdots + \frac{Ak_{e,5}}{\left(1+k_{e,5}\right)^5} + \frac{AE_5\left[k_{e,5}\right]}{\left(1+k_{e,6}\right)^6} + \cdots + \frac{AE_5\left[k_{e,5}\right]}{\left(1+k_{e,10}\right)^{10}} + \frac{AE_{10}\left[k_{e,5}\right]}{\left(1+k_{e,11}\right)^{11}} + \cdots$$

where:

- For the first 5-year regulatory period, the regulatory allowance is set according to the currently prevailing 5-year rate;
- For the second 5-year regulatory period, the regulatory allowance is set according to the prevailing 5-year rate as at time 5 (the next regulatory determination);
- For the third 5-year regulatory period, the regulatory allowance is set according to the prevailing 5-year rate as at time 10 (the next regulatory determination), and so on.

In this case, the expected present value of the regulatory allowances is less than the current RAB and there is a violation of NPV=0.

This is because the regulatory allowance will not 'keep up' with the higher discount rate required for longer period cash flows.

In any event, the clear evidence is that, in practice, investors do not tend to apply a different discount rate to each cash flow when valuing regulated infrastructure assets. They apply a single rate, based on a 10-year risk-free term, to all cash flows. Regardless of the reason why investors adopt this approach, if the regulator always sets the regulatory allowance to match the required return, the NPV=0 condition will always hold.

Setting the regulatory allowance to reflect a 5-year term will violate the NPV=0 condition in practice (because the required return reflects a 10-year term) and in Dr Boyle's scenario above (because the regulatory allowance is always re-set to a short rate, so does not 'keep up' with the higher discount rate required for longer period cash flows).

Finally, Dr Boyle observes that:

- If the market truly valued cash flows over a 5-year regulatory period using a 5-year rate; but
- The regulatory allowance was based on a 10-year rate,

there would be an opportunity for hedge funds to execute a limitless arbitrage,[130] and indeed that they "would be on to this like a tonne of bricks."[131]

The fact that there is no evidence at all of any hedge fund identifying or trading on any such arbitrage opportunity, whether like a tonne of bricks or otherwise, must indicate that the AER's current allowed return (based on a 10-year rate) admits no arbitrage opportunity. This, in turn, is inconsistent with market participants using a 5-year term to value regulatory cash flows.

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[130] https://www.aer.gov.au/system/files/Glenn%20Boyle%20-%20Comments%20on%20the%20notes%20-%209%20February%202022.pdf, p. 1; https://www.aer.gov.au/system/files/AER%20-%20Concurrent%20Evidence%20Session%202%20-%20Proofed%20transcript%20-%20February%202022.pdf, pp. 26, 35, 37.

[131] https://www.aer.gov.au/system/files/AER%20-%20Concurrent%20Evidence%20Session%202%20-%20Proofed%20transcript%20-%20February%202022.pdf, p. 26.

Recommendation 6: The case for a 5-year term does not bear scrutiny

The case for a 5-year term does not bear scrutiny because:

- The Lally derivations demonstrate no more than that NPV=0 requires that the regulatory allowance is set equal to the return that investors require.
- A 5-year term also requires that the market value of the regulated asset at the end of the regulatory period is known – at least to the extent that investors can value the network without regard to any cash flows beyond the regulatory period. This is clearly inconsistent with real-world observation.
- Applying the single-period CAPM to value the first five years of cash flows generated by a long-lived asset, independent of all subsequent cash flows, is inconsistent with finance theory. That might explain why such an approach is not applied in practice, including for regulated assets.

Recommendation 7: A 10-year term should be maintained

A 10-year risk-free rate should be maintained in the 2022 RoRI. The case for a 5-year term falls well short of any reasonable threshold at this time.

8 Market risk premium

Key messages

- The AER is considering two main sources of MRP evidence – the historical excess returns (HER) and dividend growth model (DGM) approaches. Consequently, it is important that the best possible estimates be obtained from each approach.
- For the HER approach:
  - Only arithmetic means should be used, for the reasons explained in leading textbooks; and
  - The Mathews (2019) estimates are unreliable and should receive no weight.
- For the DGM approach:
  - The ENA's calibrated DGM should receive significant weight because it adopts the AER's preferred specification, with a small modification to address the issues raised by the AER in 2018.
  - The type of 'variable growth rate' DGM considered in the *Final Omnibus* paper should receive no weight. There is no basis for the assumption that the current government bond yield for years 1 to 10 is a reasonable estimate of the perpetual growth in corporate dividends from year 11 and beyond.
- Among the approaches for distilling the HER and DGM (and any other relevant evidence) into a single MRP allowance, ENA's view is that:
  - The advice to the AER from its consultants and experts is that there is at least as much evidence for the Wright approach as there is for the historical excess returns approach. The AER has not yet adequately addressed this issue. It appears that different standards of assessment have been applied to the evidence for the HER and Wright approaches at this stage of the process.
  - Exclusive reliance on the HER approach embeds the assumption that the MRP is constant, which is contrary to the evidence and advice provided to the AER by its consultants and the expert panel.
  - Using the DGM to inform the selection of a figure from within the range of HER estimates makes no logical sense. The HER estimates differ only in terms of the start date for the historical period. The DGM does not provide any information about the best start date. Rather, the primary value of the DGM evidence is to identify market conditions where the prevailing MRP might be different from the historical average.
  - The best of the open approaches is for the AER to assess the HER and DGM evidence side-by-side and apply its regulatory judgment to select an appropriate point estimate at the time of the RoRI. If this approach does not lend itself to being codified into a process for mechanical updates, the selected MRP would remain fixed for the life of the RoRI.

8.1 Broad agreement that the MRP varies over time

The *Final Omnibus* paper notes that the AER's consultants (Lally, Partington and Satchell, and CEPA) have all advised that the MRP varies over time,[132] and the AER has stated that:

> *We recognise that the MRP may vary over time.* [133]

The view that the true MRP varies over time was confirmed by the experts during the Concurrent Evidence sessions.

Thus, the key question is how the time variation in the MRP can be appropriately embedded within the AER's regulatory process.

ENA considers that the first-best approach would be for the AER to use its judgment in having regard to all relevant evidence when selecting a risk-free rate and MRP at the time of each determination. But this approach is not permissible under the binding instrument legislation.

In our September 2021 submission, ENA proposed a second-best approach whereby the MRP allowance could be updated in a mechanical way to reflect changes in the risk-free rate during the term of the RoRI. ENA's views and submissions on this point have not changed. However, we accept that the AER has rejected that approach and has narrowed its consideration down to three potential approaches. Consequently, we provide our views on each of these methods below.

8.2 The three approaches that remain open

The AER's recent *Information Paper* sets out three approaches to the MRP that will receive further consideration throughout the 2022 review process, as follows:

- *Maintain our current approach to inform our estimates of the MRP (consistent with our 2018 Instrument). Under this approach, the historical excess returns method (using both arithmetic and geometric averages) plays a primary role in developing our MRP estimation range. We give less weight to other evidence such as DGMs, surveys and conditioning variables to inform our point estimate from within the historical excess returns range.*
- *Use estimates from the DGM to inform our point estimates of the MRP, within the range observed by our current approach (similar to our 2013 Rate of return guideline approach). That is, in exercising our judgement to pick a point estimate from the historical excess returns range, we will use the information from the DGMs in a directional sense. Where there is an increasing/decreasing trend in DGM estimates relative to their long-term averages, we may pick a point estimate that is higher or lower within the range of historical excess returns estimates, respectively. Alternatively, we could set a value for the MRP having considered both historical excess returns and DGM estimates and any other relevant evidence.*
- *Provide more weight to the DGM alongside our current approach (a mechanical approach). This would require us to determine how the historical excess returns estimate(s) and DGM(s) are weighted as well as the specifications of the DGM(s) inputs. Further, given the 2022 Instrument must be applied without exercising any*

[132] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 34.
[133] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 16.

discretion, we will also have to decide whether this method will be used to set a MRP point estimate in the 2022 Instrument or set a method that will mechanically update throughout the life of the Instrument.[134]

We note that these three options contemplate two different methods for estimating the MRP – the historical excess returns (HER) and dividend growth model (DGM) approaches. Consequently, we begin by considering how to obtain the best possible estimate from each approach. Then we consider how the relevant evidence might be combined to produce the best overall estimate.

8.3 The best possible HER estimate

Arithmetic vs. geometric returns

The *Information Paper* suggests that the AER intends to have at least some regard to geometric mean estimates.[135] ENA's view is that there is no role for geometric mean estimates in the AER's rate of return process.

In previous reviews, the AER has considered the extent to which it is appropriate to rely on arithmetic and geometric means of historical excess returns for the purpose of estimating forward-looking expected returns. The *Final Omnibus* paper sets out the AER's current position as follows:

> *We remain of the view that geometric averages have value and should be considered…We therefore consider that both the arithmetic and geometric means are relevant to consider when estimating a 10-year forward looking market risk premium using the HER.*[136]

ENA strongly disagrees with any weight being applied to the geometric mean when using historical data to estimate a forward-looking expected return. This view is supported by very clear statements on the issue in the 2020 editions of the two leading finance textbooks.

The two leading finance textbooks are *Corporate Finance* by Professors Berk and DeMarzo[137] and *Principles of Corporate Finance* by Professors Brealey, Myers and Allen.[138] The current editions of both contain clear explanations of why the arithmetic mean must be used, and why it is mathematically and conceptually incorrect to use the geometric mean when using historical data to estimate a forward-looking expected return.

Berk and DeMarzo (2020) conclude that:

> *We should use the arithmetic average return when we are trying to estimate an investment's expected return over a future horizon based on its past performance.* [139]

Their full explanation of why arithmetic means must be used when estimating forward-looking expected returns is set out in Figure 1 below.

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[134] AER, December 2021, *Rate of return: Information paper*, p. 20.
[135] AER, December 2021, *Rate of return: Information paper*, p. 20.
[136] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 43.
[137] Berk, J. and P. DeMarzo, 2020, *Corporate Finance*, 5th global edition, Pearson.
[138] Brealey, R., S. Myers and F. Allen, 2020, *Principles of Corporate Finance*, 13th edition, McGraw-Hill.
[139] Berk, J. and P. DeMarzo, 2020, *Corporate Finance*, 5th global edition, Pearson, p. 368.

Figure 1: Why arithmetic means must be used: Berk and DeMarzo

Arithmetic Average Returns Versus Compound Annual Returns

We compute average annual returns by calculating an *arithmetic* average. An alternative is the compound annual return (also called the compound annual growth rate, or CAGR), which is computed as the *geometric* average of the annual returns $R_1, \ldots, R_T$:

$$\text{Compound Annual Return} = [(1 + R_1) \times (1 + R_2) \times \ldots \times (1 + R_T)]^{1/T} - 1$$

It is equivalent to the IRR of the investment over the period:

$$(\text{Final Value/Initial Investment})^{1/T} - 1$$

For example, using the data in Figure 10.1, the compound annual return of the S&P 500 from 1926–2017 was

$$(664{,}567/100)^{1/92} - 1 = 10.04\%$$

That is, investing in the S&P 500 from 1926 to 2018 was equivalent to earning 10.04% per year over that time period. Similarly, the compound annual return for small stocks was 12.66%, for corporate bonds was 6.06%, and for Treasury bills was 3.3%.

In each case, the compound annual return is below the average annual return shown in Table 10.3. This difference reflects the fact that returns are volatile. To see the effect of volatility, suppose an investment has annual returns of +20% one year and −20% the next year. The average annual return is $\frac{1}{2}(20\% - 20\%) = 0\%$, but the value of $1 invested after two years is

$$\$1 \times (1.20) \times (0.80) = \$0.96$$

That is, an investor would have lost money. Why? Because the 20% gain happens on a $1 investment, whereas the 20% loss happens on a larger investment of $1.20. In this case, the compound annual return is

$$(0.96)^{1/2} - 1 = -2.02\%$$

This logic implies that the compound annual return will always be below the average return, and the difference grows with the volatility of the annual returns. (Typically, the difference is about half of the variance of the returns.)

Which is a better description of an investment's return? The compound annual return is a better description of the long-run *historical* performance of an investment. It describes the equivalent risk-free return that would be required to duplicate the investment's performance over the same time period. The ranking of the long-run performance of different investments coincides with the ranking of their compound annual returns. Thus, the compound annual return is the return that is most often used for comparison purposes. For example, mutual funds generally report their compound annual returns over the last five or ten years.

Conversely, we should use the arithmetic average return when we are trying to estimate an investment's *expected* return over a *future* horizon based on its past performance. If we view past returns as independent draws from the same distribution, then the arithmetic average return provides an unbiased estimate of the true expected return.*

For example, if the investment mentioned above is equally likely to have annual returns of +20% and −20% in the future, then if we observe many two-year periods, a $1 investment will be equally likely to grow to

$$\begin{aligned}(1.20)(1.20) &= \$1.44,\\ (1.20)(0.80) &= \$0.96,\\ (0.80)(1.20) &= \$0.96,\\ \text{or } (0.80)(0.80) &= \$0.64.\end{aligned}$$

Thus, the average value in two years will be $(1.44 + 0.96 + 0.96 + 0.64)/4 = \$1$, so that the expected annual and two-year returns will both be 0%.

* For this result to hold we must compute the historical returns using the same time interval as the expected return we are estimating; that is, we use the average of past monthly returns to estimate the future monthly return, or the average of past annual returns to estimate the future annual return. Because of estimation error the estimate for different time intervals will generally differ from the result one would get by simply compounding the average annual return. With enough data, however, the results will converge.

Source: Berk, J. and P. DeMarzo, Corporate Finance, 5th global edition, Pearson, p. 368.

Similarly, Brealey, Myers and Allen (2020) conclude as follows:

> *Moral: If the cost of capital is estimated from historical returns or risk premiums, use arithmetic averages, not compound annual rates of return.* [140]

Their full explanation of why arithmetic means must be used when estimating forward-looking expected returns is set out in Figure 2 below.

[140] Brealey, R., S. Myers and F. Allen, 2020, *Principles of Corporate Finance*, 13th edition, McGraw-Hill, p. 170.

Figure 2: Why arithmetic means must be used: Brealey, Myers and Allen

Arithmetic Averages and Compound Annual Returns

Notice that the average returns shown in Table 7.1 are arithmetic averages. In other words, we simply added the 118 annual returns and divided by 118. The arithmetic average is higher than the compound annual return over the period. The 118-year compound annual return for common stocks was 9.6%.[5]

The proper uses of arithmetic and compound rates of return from past investments are often misunderstood. Therefore, we call a brief time-out for a clarifying example.

Suppose that the price of Big Oil's common stock is $100. There is an equal chance that at the end of the year the stock will be worth $90, $110, or $130. Therefore, the return could be −10%, +10%, or +30% (we assume that Big Oil does not pay a dividend). The *expected* return is ⅓ (−10 + 10 + 30) = +10%.

If we run the process in reverse and discount the expected cash flow by the expected rate of return, we obtain the value of Big Oil's stock:

$$PV = \frac{110}{1.10} = \$100$$

The expected return of 10% is therefore the correct rate at which to discount the expected cash flow from Big Oil's stock. It is also the opportunity cost of capital for investments that have the same degree of risk as Big Oil.

Now suppose that we observe the returns on Big Oil stock over a large number of years. If the odds are unchanged, the return will be −10% in a third of the years, +10% in a further third, and +30% in the remaining years. The arithmetic average of these yearly returns is

$$\frac{-10 + 10 + 30}{3} = +10\%$$

Thus, the arithmetic average of the returns correctly measures the opportunity cost of capital for investments of similar risk to Big Oil stock.[6]

The average compound annual return[7] on Big Oil stock would be

$$(.9 \times 1.1 \times 1.3)^{1/3} - 1 = .088, \text{ or } 8.8\%$$

which is *less* than the opportunity cost of capital. Investors would not be willing to invest in a project that offered an 8.8% expected return if they could get an expected return of 10% in the capital markets. The net present value of such a project would be

$$NPV = -100 + \frac{108.8}{1.1} = -1.1$$

Moral: If the cost of capital is estimated from historical returns or risk premiums, use arithmetic averages, not compound annual rates of return.[8]

Source: Brealey, R., S. Myers and F. Allen, 2020, Principles of Corporate Finance, 13th edition, McGraw-Hill, pp. 169-170.

Other relevant evidence on this issue includes a Harvard Business School Case that compares the use of arithmetic and geometric means of historical excess stock returns. The instructor solutions to that case note that it is the *expected* annual return that is relevant when estimating MRP and that:

> *Students focusing on the geometric average will argue that it is the appropriate growth rate of an investment…However, the arithmetic average is a better measure of the expected return on an investment.*[141]

The instructor solutions then set out a number of numerical examples to demonstrate why the arithmetic mean is correct and the geometric mean is incorrect. The instructor solutions are also quite clear about which approach should be used to estimate the MRP:

> *The arithmetic average annual return is the correct measure of the expected annual return.*[142]

Consistent with the views of leading textbooks and HBR cases, Dr Lally has advised that the arithmetic return must be used and that the geometric return is inconsistent with the NPV=0 principle. He presents a detailed algebraic analysis to evaluate whether each form of average is consistent with the NPV=0 principle and concludes that:

> *The geometric mean fails this test whilst the arithmetic mean will satisfy it if annual returns are independent and drawn from the same distribution. So, if historical average returns are used, they should be arithmetic rather than geometric.*[143]

ENA considers that the evidence on this point is compelling. Leading textbooks and case studies prepared by Professors at Harvard, Stanford, MIT, Wharton and London Business School not only report that they recommend the use of arithmetic means, but explain why it is wrong to use a geometric mean for the purpose of estimating forward-looking expected returns.

The 2018 RoRI materials suggest that the geometric mean might be more appropriate if the investment horizon increases,[144] citing Jacquier, Kane and Marcus (2003)[145] as support for that proposition. But this is only relevant if the AER compounds returns over an investment horizon. But nowhere in the AER's process does it compound any returns, so that rationale is not relevant. Indeed, Dr Lally has previously explained to the AER that this point, and consequently Jacquier, Kane and Marcus (2003) is not relevant because there is no compounding of returns in the AER's process:

> *The AER's belief that geometric averages are useful apparently arises from a belief that there is a compounding effect in their regulatory process (AER, 2012, Appendix A.2.1), and therefore the analysis of Blume (1974) and Jacquier et al (2003) applies. However, I do not think that there is any such compounding effect in regulatory situations and the absence of a compounding effect leads to a preference for the arithmetic mean over the geometric mean. If historical average returns are used, they should be arithmetic rather than geometric averages.*[146]

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[141] HBS Marriott Corporation Case, Instructor Guide.
[142] HBS Marriott Corporation Case, Instructor Guide.
[143] Lally, M., 2012, *The cost of equity and the market risk premium*, p. 32. Moreover, historical excess returns must be independent and drawn from the same unconditional distribution to support an historical mean estimate.
[144] AER, December 2018, *Rate of Return Instrument: Explanatory Statement*, p. 90.
[145] Jacquier E, A. Kane and A.J. Marcus, 2003, *Geometric or Arithmetic Mean: A Reconsideration*, Financial Analysts Journal, 59, pp.46- 53.
[146] Lally, M., *The cost of equity and the market risk premium*, Victoria University of Wellington, 25 July 2012, pp. 31-32.

NERA (2012)[147] has also previously explained the same point.

This point is again explained in more detail in Wheatley (2021). [148]

During the concurrent evidence sessions:

- Dr Lally confirmed his view that the arithmetic mean is consistent with the NPV=0 principle and the geometric mean is not.[149]
- Dr Boyle observed that the geometric mean would only receive weight to the extent that annual excess returns exhibited serial correlation – for example, if a high excess return in one year tended to be followed by a low excess return in the next, and vice versa. But this would require the AER to use HER in a very different way. In particular, the negative serial correlation would imply that a lower-than-average MRP should be adopted after a period of high excess returns, and vice versa. It would be clearly inconsistent to give some weight to geometric means on the basis that there is serial correlation, but then to use the result in a way that assumes no serial correlation. If excess returns are considered to be iid (as they are in the way the AER currently uses them) 100% weight must be applied to the arithmetic mean.
- Mr Partington made an apparent reference to an optimal weighting formula. This is apparently a reference to Jacquier, Kane and Marcus (2003) above and is not relevant because there is no compounding of returns anywhere in the AER's process, as explained above.
- Mr Hancock also referred to a compound annual growth rate over the length of each regulatory period. This is not relevant because there is no compounding of returns anywhere in the AER's process, as explained above.

Recommendation 8: No geometric means

Geometric means have no role to play in the AER's regulatory task. There is no rationale for having regard to geometric means and there are consistent and clear explanations from a range of sources as to why arithmetic means must be used in the AER's process.

The Mathews data and approach

The AER's July 2021 *Equity Omnibus* paper drew attention to a discussion paper by Mathews (2019). [150] [151]

ENA commissioned Dr Simon Wheatley to consider the Mathews (2019) approach and attached his report to our September 2021 submission. [152] Dr Wheatley identified a number of quite fundamental issues with the Mathews approach:

- **Mathews recommends that the Lamberton data should be preferred to his**

[147] NERA, February 2012, *The market risk premium: A report for CitiPower, Jemena, Powercor, SP AusNet and United Energy*, pp. 3-12.
[148] Wheatley, S., August 2021, *An examination of the RBA's new estimates of the MRP*, Section 6.
[149] https://www.aer.gov.au/system/files/Martin%20Lally%20-%20Some%20thoughts%20on%20the%20upcoming%20expert%20sessions%20-%2030%20January%202022.pdf, pp. 6-7.
[150] Mathews, T., 2019, *The Australian equity market over the past century*, RBA Bulletin. Pp. 167-171.
[151] Mathews, T., 2019, *The Australian equity market over the past century*, RBA Research Discussion Paper, RDP 2019-04.
[152] Wheatley, S., August 2021, *An examination of the RBA's new estimates of the MRP*.

Properly accounting for capitalisation changes is crucial when measuring stock returns. Mathews highlights that his approach to capitalisation changes (see below) is an approximation at best and recommends that the Lamberton data should be preferred to his approximations:

> ***The share price indices calculated are probably the least reliable of all the series*** *due to the lack of information required to calculate an accurate divisor, a number used to deflate the index due to adjustments in the capital structure of included companies. To calculate this requires information about the terms of equity issuance, which is lacking from the RBA dataset: we can only infer issuance from a change in the number of shares outstanding.*
>
> *The approximation used is to assume that all equity issuance greater than 100 per cent of shares outstanding is a stock split, and not dilutive of existing shareholders. Everything else is assumed 100 per cent dilutive and therefore the index is revised down. As a result of this,* ***the Lamberton share indices should be preferred to the ones calculated from the RBA dataset****, where they are available.* [153]

Dr Wheatley explains why the Mathews approximation will produce estimates that are downwardly biased.

- **Introduction of biases from capitalisation change assumptions:**

  Mathews computes his own series of stock returns. He derives those returns from information about prices, dividend yields and number of shares outstanding. The data available to Mathews, however, does not include information about capitalisation changes such as stock splits and bonus issues. In seeking to account for this, Mathews employs a crude assumption – that a stock split has occurred whenever the number of outstanding shares doubles, but not otherwise. Dr Wheatley provides a number of examples where this crude assumption significantly fails to result in an unbiased estimate of the risk premium.

- **Use of approach that is inconsistent with AER MRP estimates**:

  Mathews constructs MRP estimates that differ from the approach that is ordinarily used in practice, including by the AER. Rather than subtracting the 10-year government bond yield, Mathews subtracts the one-year holding period return on 10-year government bonds. That is, rather that measuring the MRP in excess of the 10-year government bond yield, he measures the return relative to what could have been earned by buying a bond at the beginning of the year, holding it for one year and then selling it. Thus, if the Mathews approach is adopted for the MRP, a consequential change would have to be made to the approach for estimating the risk-free rate – in order to preserve consistency.

  Dr Wheatley explains why the Mathews approach to the risk-free rate is likely to produce MRP estimates that are downwardly biased relative to the standard approach that is currently employed by the AER.

- **Exclusion of dividend imputation impacts:**

  Mathews appears to make no adjustment for the assumed value of dividend imputation tax credits, so will be downwardly biased relative to the AER's current approach.

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[153] Mathews, T., 2019, *The Australian equity market over the past century*, RBA Research Discussion Paper, RDP 2019-04, p. 32, emphasis added.

- **Reliance on geometric mean:**

  Mathews reports the geometric mean, which is incorrect for the reasons set out above.

In our September 2021 submission, ENA proposed that the AER should have no further regard to the Mathews (2019) figures through the 2022 RoRI process.

The AER has recently stated that:

> *We consider there are limitations with the price series as noted by both the RBA discussion paper and the HoustonKemp report and this likely prevents us relying on it.* [154]

Dr Wheatley has since identified another material problem with the Mathews data – a coding error in which an 'ifelse' statement has been inadvertently reversed such that it performs the opposite function to that which is intended.[155] Whereas this error might be corrected, there would seem to be little point in doing so, given the long list of other problems with this data.

ENA suggests that the problems are so many and so fundamental that the AER cannot now safely rely upon this analysis.

The AER goes on to suggest that it may consider whether the Mathews dividend data might be used to modify its existing historical data set.[156] ENA proposes that no change should be made to the longstanding historical record used by the AER without a suitable detailed consultation process involving proper scrutiny by all stakeholders. This is particularly important in light of the many problems that have already been identified in relation to the Mathews analysis.

A change to the AER's historical data series would also be inconsistent with its previous observations that the existing series should be maintained in the face of proposed adjustments because:

> *The original data is published in a peer reviewed journal* [157]

and:

> *The original data (including adjustment in early years) is supplied by a credible source (the ASX).* [158]

Recommendation 9: Disregard Mathews (2019)

The Mathews (2019) analysis of historical excess returns is so affected by a range of fundamental problems that no regard should be given to it.

Historical time periods

The AER in 2018 computed the mean excess return over five different historical periods and concluded that the most recent period (post 1988) was most relevant to its task:

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[154] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 42.
[155] Wheatley, S., February 2021, *Memo: RBA discussion paper 2019-04*.
[156] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 42.
[157] AER, December 2013, *Final Rate of Return Instrument: Appendices*, p. 83.
[158] AER, December 2013, *Final Rate of Return Instrument: Appendices*, p. 83.

> *We have calculated HER over multiple time periods including both 100 year and 30 year periods. However, we consider data from the most recent period is the most relevant to our estimation of a forward looking MRP as it is most representative of recent market trends including the introduction of imputation credits and higher levels of integration with international markets.* [159]

The 2018 RoRI noted that the most recent period – from 1988 to 2017 – generated a mean estimate of 6.1% at that time:

> *The most recent, 30 year, period produces an estimate of 6.1 per cent and is most likely to reflect current prevailing conditions.* [160]

In 2018 the AER then concluded that:

> *We derive a point estimate of 6.1 per cent from HER evidence.* [161]

ENA notes the prominence of the period starting in 1988 within the AER's estimation process.

During the concurrent evidence sessions, Dr Boyle drew a distinction between the 'unconditional' and 'conditional' MRP estimates. The unconditional estimate is the long-run average whereas the conditional estimate varies over time with changes in market conditions.

Dr Boyle noted that the HER approach produces an estimate of the unconditional MRP to the extent that the data series is stationary and ergodic. In simple terms, this means that if each year produces a draw of the MRP from the same statistical distribution, the empirical mean is an appropriate estimate of the true mean of that stationary distribution. The alternative case would be where (say) older and newer data were being generated from materially different distributions – in which case the mean estimated from a mixture of data would not be meaningful.

The fact that the mean estimates from the AER's five historical periods are broadly similar (e.g., they are not statistically significantly different) indicates that concerns about older data being unrepresentative have little practical effect in the AER's use of this evidence.

8.4 The best possible DGM estimate

The basis for the DGM approach

ENA notes that the DGM approach differs from the HER approach in two respects:

- It is entirely forward-looking in that it uses only current information rather than historical observations; and
- It requires no assumption about the relationship between the risk-free rate and the MRP, rather leaving the data to determine the extent of that relationship as part of the estimation process.

The AER has noted the strong conceptual basis for the DGM approach as follows:

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[159] AER, December 2018, *Final Rate of Return Instrument: Explanatory Statement*, pp. 90-91.
[160] AER, December 2018, *Final Rate of Return Instrument: Explanatory Statement*, p. 94.
[161] AER, December 2018, *Final Rate of Return Instrument: Explanatory Statement*, p. 94.

> *The DGM method is a theoretically-sound estimation method for the MRP. As DGM estimates incorporate prevailing market prices, they are more likely to reflect prevailing market conditions. DGM estimates are also clearly forward-looking as they estimate expectations of future cash flows and equate them with current market prices through the discount rate.* [162]

The AER's July 2021 *Equity Omnibus* paper observed that Brattle has advised the AER that many comparable regulators use the DGM approach to estimate the MRP and that the AER's approach would be improved by having regard to such forward-looking evidence:

> *In the International regulatory approaches to rate of return working paper, we have received expert advice from the Brattle Group that the dividend growth model could be used to estimate a more forward looking MRP. Brattle's report also identified other regulators that used the dividend growth models to estimate the MRP.* [163]

During the Concurrent Evidence sessions, a number of experts identified the strong theoretical underpinnings of the DGM approach, noted its use in practice, and concluded that the DGM is a useful way to estimate the prevailing MRP.

Experts also noted that, if the AER has concerns with the implementation of the DGM, the appropriate course of action would be to clearly identify those concerns and seek to address them. ENA agrees that disregarding all DGM evidence without seeking to address such concerns would seem to be an extreme approach.

The 'calibrated' DGM approach

During the Concurrent Evidence sessions, Mr Kumareswaran noted that the calibrated DGM represented ENA's good faith attempt to address the concerns about the DGM that had been identified in the 2018 RoRI process.

The AER's July 2021 *Equity Omnibus* paper summarises the reasons why the AER in 2018 decided to give no weight to the DGM approach:

> *We acknowledge that the Dividend Growth Models can be used to inform the MRP, but we are aware of, and are concerned about the limitations of using this model. In the 2018 rate of return review, we have identified precision, accuracy and bias issues that detract from its potential use in a regulatory setting.*
>
> *A significant issue surrounding DGMs is that they are highly sensitive to input assumptions regarding short and long-term dividend growth rates. There are a wide range of potential dividend growth rates deemed appropriate for use in the DGM, which provide an equally wide range of results.*
>
> *We have also previously noted that the DGMs could be upwardly biased.* [164]

ENA notes that the two primary reasons for the AER's 2018 rejection of the DGM approach were that:

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[162] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 46.
[163] AER, July 2021, *Equity Omnibus*, p. 24.
[164] AER, July 2021, *Equity Omnibus*, pp. 25-26.

- There is no single objective means for determining the long-run growth rate, and estimates are sensitive to the choice of that parameter; and
- There are concerns that the DGM approach might produce estimates that are systematically upwardly biased. This could be because the estimate of long-run growth or because analyst dividend forecasts are upwardly biased or because dividends are 'sticky' and slow to decline after a fall in stock prices, or for some other reason.

Consequently, ENA has sought to construct a version of the DGM that specifically addresses these two concerns expressed by the AER in 2018. This has resulted in a 'calibrated' DGM that is constructed in the following manner:

- We start with the AER's preferred specifications of the two-stage and three-stage DGM;
- We adopt the same consensus dividend forecasts and timing conventions as the AER has used in the past;
- We adopt the AER's 2018 estimate of theta, and make the same adjustment for imputation credits that the AER has used in the past; and
- We then solve for the (unique) long-run growth rate that equates the mean DGM estimate with the AER's preferred estimate of the historical average MRP. For illustrative purposes, we have adopted a mean MRP figure of 6.1%, consistent with the 2018 RoRI. That figure would be updated to reflect the AER's HER estimate at the time of the 2022 RoRI. It is obviously important that the averages of the HER and DGM approaches must be calibrated over the same historical period.

ENA considers that this approach addresses the key concerns expressed by the AER in 2018 as follows:

- The long-run growth rate is not estimated as a separate parameter, but is derived as part of the estimation process. There is a unique long-run growth estimate that equates the average of the DGM estimates with the average from the historical excess returns approach. Under this approach, there is no debate about what figure should be used for the growth parameter and no need for testing sensitivities to alternative growth estimates; and
- By definition, there is no bias in the DGM estimates relative to the historical excess returns estimates – both are constructed to have the same average. The only difference is that the historical excess returns approach is essentially constant over time, whereas the DGM estimates will fluctuate around the average figure as market conditions change.

Thus, ENA considers that this 'calibrated' DGM approach provides useful information about the forward-looking MRP. It has a number of attractive features and has been developed after carefully considering the issues identified by the 2018 AER and seeking to address them.

Another attractive feature of the calibrated DGM approach is that it produces uniformly positive MRP estimates. The *Final Omnibus* paper notes that some DGM specifications have produced negative MRP estimates in some historical periods,[165] but this is not relevant to the calibrated DGM approach.

The *Final Omnibus* paper notes that the AER intends to consult further on the suitability of the calibrated DGM approach:

[165] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 35.

This model was endorsed by the network businesses and investor groups. We plan to engage with the ENA to discuss the suitability of the calibrated DGM for regulatory purposes. We are also interested in hearing the expert's views on the calibrated DGM and its underlying methodology to address the concerns we have raised in the past. [166]

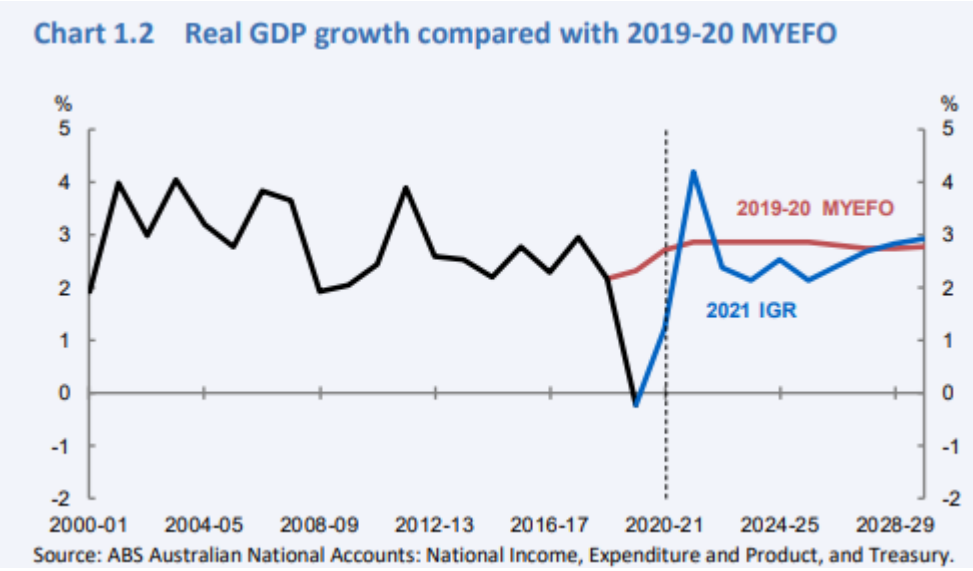
ENA looks forward to assisting the AER as required throughout this process.

Assumptions about perpetuity growth rates

The Final Omnibus paper makes a number of comments about the perpetuity growth rate that is required for implementation of the DGM. The AER's 3-stage DGM specification, for example, requires an estimate of the annual growth rate of dividends that applies from year 11 and onwards in perpetuity. The AER's base case specification ties this long-run perpetual growth rate to the long-run growth rate in the broad economy (GDP growth). The AER's approach has been to adopt the same long-run perpetual growth rate regardless of the current state of the economy from time to time. ENA considers this approach to be sensible and reasonable – the current state of the economy is unlikely to have any bearing on the long-run perpetuity estimate of growth. The fact that economic growth might have been low in the current quarter does not lead to a downward revision of average economic growth for the perpetual future starting in year 11. Rather, periods of high and low growth cycle through time but have little impact on the best estimate of very long-run growth in perpetuity.

This approach of adopting the same long-run growth rate independent of current economic conditions can also be observed in Commonwealth GDP forecasts. Whether the current quarter has strong growth, low growth, or negative growth has important implications for the growth forecast next quarter, but not for the forecast of long-run perpetual growth starting 10 years later. A good example of this is in the 2021 Intergenerational Report, which shows that the pandemic has a very significant impact on near term GDP growth forecasts, but not on forecasts beyond 10 years in the future, as illustrated in Figure 3 below.

Figure 3: Short-term vs. long-term forecasts of GDP growth



[166] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 48.

Source: Commonwealth of Australia, June 2021, 2021 Intergenerational Report, Chart 1.2, p. 7.

ENA has adopted the same approach of a fixed long-run perpetual growth rate in our calibrated DGM model. We compute the unique constant long-run growth rate that ensures that the average DGM estimate equals the corresponding HER estimate. This is based on the notion that the best forecast of perpetual growth in the long-run future is relatively stable and does not vary markedly with the current market conditions.

The *Final Omnibus* paper considers the notion of using a fixed forecast of perpetual growth in the long-term future versus using growth forecasts that vary materially with changes in the then prevailing economic conditions.

In relation to our calibrated DGM, the *Final Omnibus* paper states that:

> *At this point we note that ENA's calibrated DGM is a fixed growth rate DGM which result in a negative relationship between the MRP and risk-free rate.*[167]

It is important to note that this negative relationship is an outcome of the market data and not an assumption of the model. The calibrated DGM makes no assumption at all about the relationship between the MRP and the risk-free rate. The model simply estimates the required total market return from time to time and the MRP is obtained by deducting the risk-free rate at that time. When the model is applied to the data, the outcome is that the required total market return is more stable than the risk-free rate. That is, when the risk-free rate falls, the required total market return tends to fall, but not by as much. This manifests as a negative relationship between the MRP and risk-free rate.

But this negative relationship is an outcome of the data, not an assumption that is built into the model. If the true relationship was positive the model would pick that up. There is nothing to prevent the model from documenting a change in the total market return that is *greater* than the corresponding change in the risk-free rate – if that were in the data.

CEPA has recently made the same point in their advice to the AER:

> ***The forward-looking approaches make no assumption** about the relationship between the RfR and the MRP, it is derived as part of the estimation. **For the historic approaches, an implicit assumption is required**: for the "Ibbotson" [fixed MRP] approach it is an implicit assumption that the MRP is stable, whereas for the "Wright" [fixed TMR] approach it is an implicit assumption that it varies inversely with the RfR.*[168]

The *Final Omnibus* paper considers a different specification of the DGM in which the perpetual growth rate in the long-run future is set equal to the prevailing 10-year government bond yield from time to time:

> *We have also generated a model that varies the growth rate with the risk-free rate, which is consistent with an approach used by Damodaran. The risk-free rate is not necessarily the correct growth rate, but this analysis shows the effect of varying the growth rate with the risk-free rate. This analysis shows that if the growth rate varies with and matches our risk-free rate proxy, it changes the negative correlation between the MRP and the risk-free rate to a positive correlation. This demonstrates that the relationship found between the risk-*

[167] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 49.
[168] CEPA, June 2021, *Relationship between RFR and MRP*, p. 4, emphasis added.

free rate and the MRP in outputs from DGMs can change materially depending on assumptions about the growth rate and how it evolves through time. We do not claim that this is the correct relationship, but it highlights the sensitivity of the model to input assumptions. [169]

Before explaining the evident problems with this specification, we note the strong caveats that the AER has provided and that the point of presenting this analysis is simply to show that different specifications of the DGM will produce different outcomes. We agree with this point and note that it is precisely for this reason that care must be taken to adopt a sensible specification of the DGM – an implausible specification of the DGM will accordingly produce unreliable outputs.

We note that the calibrated DGM adopts the sensible specification of the DGM that the AER has adopted since 2013 with one change – instead of fixing the growth rate based on the long-run forecast of GDP growth, the growth rate is fixed to match the HER estimate.

By contrast, there is no basis for setting the perpetuity growth rate in the long-term future to equal the prevailing 10-year government bond yield from time to time. There is no logical reason to equate the expected growth rate in dividends from years 11 to infinity with the yield on government bonds from years 1 to 10. That would imply that investors expect dividend growth in year 11 to equal whatever is the prevailing government bond yield today – and to stay at that level *forever* thereafter. The current government bond yield implies a materially negative real rate, so the assumption that dividends would decline in real terms forever would be built into the model. This clearly makes no sense at all.

The *Final Omnibus* paper notes that Damodaran has conjectured a link between government bond yields and GDP growth in a set of slides that is available on the internet. [170] [171] However, even if there was some basis for such a relationship, the two variables would have to pertain to the same period of time. The DGM requires an estimate of dividend growth (for which Damodaran might use GDP growth as a proxy) for years 11 to infinity. So, what would be required is an estimate of government bond yields also for years 11 to infinity. That is, what would be required is not the current spot government bond yield, but a reasonable estimate for the government bond yield in perpetuity in the long-run future. This long-run future estimate would likely be stable over time. For example, the *2021 Intergenerational Report* considers a number of scenarios for the future evolution of the 10-year government bond yield. All converge to the same long-run perpetuity forecast.[172]

In summary, it is important to note that the DGM requires an estimate of dividend growth in years 11 to infinity. It is a perpetual growth rate that pertains to the long-term future. Thus, any changes to this parameter should only be made to the extent that there is evidence to suggest that the perpetual long-term growth rate has changed – which seems unlikely in the short-term.

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[169] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 50.
[170] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 50.
[171] http://people.stern.nyu.edu/adamodar/podcasts/valUGspr17/session11.pdf.
[172] Commonwealth of Australia, June 2021, 2021 Intergenerational Report, Chart 6.15, p. 85.

Recommendation 10: Have regard to DGMs (sensible specifications only)

The DGM approach has a strong theoretical basis and provides useful evidence about the forward-looking MRP. DGM specifications that are economically sensible and which address the AER's previous concerns should be used to inform the MRP allowance in the 2022 RoRI.

8.5 Combining the relevant evidence

The ENA September 2021 submission

Our submission in September 2021 proposed that there are two aspects to the estimation of the MRP:[173]

- The AER should first have regard to all relevant evidence and apply its judgment to select the best possible estimate of the MRP at the time of the RoRI; and
- The AER should then embed within the RoRI the relationship between the risk-free rate and MRP that is implied by the weights applied to the various estimates at the time of the RoRI.

We set out an example (only to illustrate how the proposed procedure would work) for the case where the AER decided to apply equal weight to the HER, Wright and DGM approaches. In this case, each of the three methods implies a different relationship between the risk-free rate and the MRP:

- The HER approach is based on the assumption that there is no relationship at all between the risk-free rate and the MRP. That is, the relationship between the two variables is 0;
- The Wright approach is based on the assumption that there is a perfect negative relationship between the risk-free rate and the MRP. That is, the relationship between the two variables is -1.
- The calibrated DGM estimates exhibit an empirical relationship of -0.8.

In the case where all three methods receive equal weight, the implied relationship between the MRP and risk-free rate is:

$$\frac{1}{3} \times (0) + \frac{1}{3} \times (-1) + \frac{1}{3} \times (-0.8) = -0.6$$

In this case, for every 100 basis point increase in the risk-free rate (between the time of the RoRI and the time of the particular determination), there would be a 60 basis point decrease in the MRP allowance.

ENA remains of the view that this proposed approach is a straightforward way of updating the MRP during the term of the RoRI – in a way that is consistent with the AER's judgment applied in selecting the 'starting point' RoRI estimate. Our proposed approach was designed to provide estimates that are close to what the AER is likely to have adopted if the legislation had permitted it to perform a full re-estimation at the time of each determination – but within the constraints of the formulaic updating that is required under a binding RoRI. ENA's views and submissions on this point have not changed.

However, ENA accepts that the AER has rejected that approach and has narrowed its consideration down to three potential approaches. Consequently, we provide our views on each of these methods below.

[173] ENA, September 2021, *Estimating the cost of equity*, pp. 67-68.

The options that remain open

The *Information Paper* sets out three methods that the AER proposes to consider for estimating the MRP:

- Maintain the current approach of relying on HER estimates;
- Use the DGM evidence (and/or other evidence) to inform judgment about the selection of a point within the range of HER estimates; or
- Have regard to HER and DGM evidence (and/or other evidence) 'side by side' when selecting the MRP at the time of the RoRI and either:
  - Maintain the RoRI point estimate for the duration of the instrument; or
  - Codify how the HER and DGM (and any other evidence) could be mechanically updated in determinations conducted during the life of the RoRI.

The merits of each option are considered in turn below.

Maintain reliance on the current HER approach

In the 2018 RoRI, the AER used HER estimates as its primary approach and selected a preliminary MRP figure that was not subsequently perturbed by the consideration of any other evidence.

ENA's view is that the HER estimates are relevant evidence that should receive material weight, but not exclusive weight in the AER's process for estimating the MRP.

ENA's view (consistent with the expert view in the Concurrent Evidence sessions) is that there is clear evidence that the true MRP varies over time, but the HER estimate is effectively constant over time. The HER approach can only produce an estimate of the long-run average MRP, but the prevailing MRP may be higher or lower than this average at a particular point in time. Consequently, it is important to also consider evidence that provides some light on whether the MRP might be higher or lower than this long-run average at the time of the relevant determination.

CEPA has recently advised the AER that the:

> *Recent finance academic literature overwhelmingly uses a time-varying MRP,* [174]

whereas the historic approaches assume that the MRP is fixed:

> *For the historic approaches, an implicit assumption is required: for the "Ibbotson" [HER] approach it is an implicit assumption that the MRP is stable, whereas for the "Wright" [fixed TMR] approach it is an implicit assumption that it varies inversely with the RfR. Regulators place weight on historic measures of the MRP in determining the cost of capital, and an assumption – implicit or explicit – is therefore required.* [175]

That is, when implementing the CAPM:

$$E[r_i] = r_f + \beta_i\left(E[r_m] - r_f\right)$$

[174] CEPA, June 2021, *Relationship between RFR and MRP*, p. 13.
[175] CEPA, June 2021, *Relationship between RFR and MRP*, p. 4.

using the historic approaches:

- The HER approach requires the assumption that $E[r_m] - r_f$ is constant over time; and
- The Wright approach requires the assumption that $E[r_m]$ is constant over time in real terms.

The CAPM itself provides no guidance about any such assumption because it is a one period model.

There is at least as much theoretical support for the Wright approach of an assumed constant market return as there is for adopting the HER approach, as summarised by CEPA's report to the AER. Under the CAPM, both $E[r_m] - r_f$ and $E[r_m]$ are constant over the single period that is contemplated by the model. Thus, empirical evidence of which assumption best reflects the observed data becomes relevant.

In this regard, CEPA has recently advised the AER that:

> *There also appears to be as strong a theoretical basis for the argument that the RfR and the MRP are perfectively negatively correlated (the "Wright" approach) as there is for the argument that the RfR and total equity market returns are perfectly positively correlated (the fixed MRP approach).* [176]

CEPA further explains that, when considering the historical data, there is "no good evidence" to support the assumption of a constant MRP.[177] This leads CEPA to advise that an approach that has real regard to estimates from the Wright approach (either alone, or in combination with the HER approach) might provide a better estimate of the MRP:

> *Our assessment is that (i) **there is acceptance that MRP is not stable** and (ii) it is possible that there is an inverse relationship between the forward looking MRP and the RfR, and (iii) **there is no good evidence that the MRP should be assumed to be independent of the RfR, the current implicit assumption of the AER's approach**, and (iv) there is no conclusive theoretical basis for an assumption of independence or dependence.*
>
> - *In judging evidence on MRP using historic data, the AER can choose whether to use:*
> - *An assumption that the MRP is fixed (current approach)*
> - *An assumption that the TMR is stable ("Wright approach")*
>
> *An approach that has regard to both measures. This could be for example a weighted average of the two measures, that assumes that the MRP is related to the RfR, but the relationship is not one to one.*
>
> *Our review of international regulators demonstrates that regulatory processes can accommodate any of these approaches. The data to implement these for Australia is available.*
>
> *The evidence indicates that **the second two alternatives cannot be ruled out, and may provide a better estimate of the forward looking MRP consistent with the AER's duty**. We suggest that consideration of these options, and the evidence that would be necessary to decide between them is undertaken as part of the 2022 RORI process.* [178]

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[176] CEPA, June 2021, *Relationship between RFR and MRP*, p. 14.
[177] CEPA, June 2021, *Relationship between RFR and MRP*, pp. 6-7.
[178] CEPA, June 2021, *Relationship between RFR and MRP*, pp. 6-7, emphasis added.

During the Concurrent Evidence sessions, a number of experts made the point that there is no real basis for giving material weight to the HER approach and zero weight to the Wright approach. For example, Dr Lally advised that:

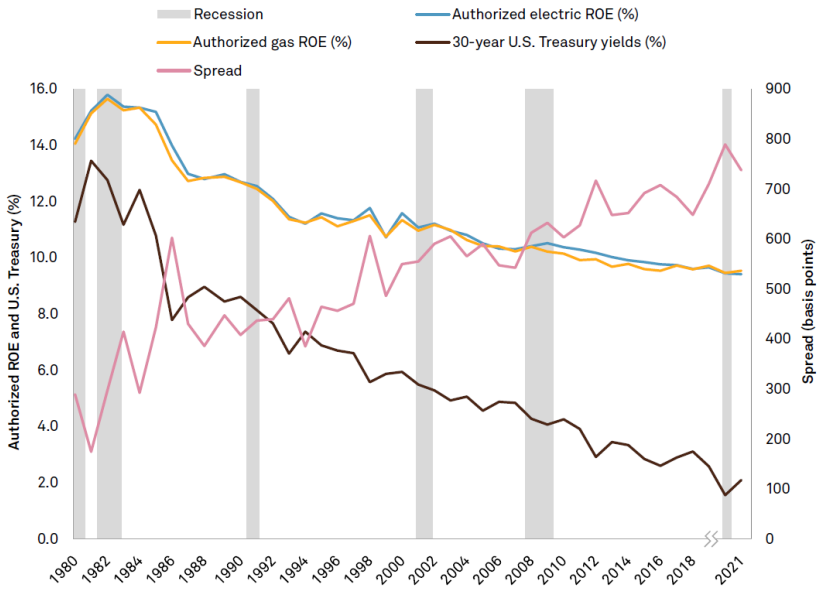
> *I would say to you, "All methods are imperfect. So choose a set of methods that you think are, for all their imperfections, worth putting weight on, and then equally weight those methods." And the set of methods that I would recommend is not only historical averaging and the dividend growth model, but this Wright estimator.*[179]

Similarly, Dr Mirrlees-Black advised that:

> *…is the historic MRP the right metric to measure or should we be measuring total market returns? Is that a better measure of a structural economic variable?* ***And I think that there's evidence that the real total market return is at least as good and weight should be placed potentially on both of those****..*[180]

In this regard, Standard and Poor's has recently noted that US regulators have not reduced their allowed return on equity one-for-one with the decline in risk-free rates. Rather, the allowed return on equity has been more stable, consistent with some weight being applied to the Wright approach, and inconsistent with exclusive reliance on the HER approach. See Figure 4 below, noting that spreads are relative to 30-year government bonds.

Figure 4: US regulatory allowances relative to 30-year government bond yield



Source: Standard and Poor's, February 2022, The big picture: 2022 electric natural gas, and water utilities outlook, Figure 2, p. 5.

[179] https://www.aer.gov.au/system/files/AER%20-%20Concurrent%20Evidence%20Session%203%20-%20Proofed%20transcript%20-%20February%202022.pdf, p. 66.
[180] https://www.aer.gov.au/system/files/AER%20-%20Concurrent%20Evidence%20Session%203%20-%20Proofed%20transcript%20-%20February%202022.pdf, p. 51.

Recommendation 11: Consultants and experts advocate for Wright approach

ENA agrees with the advice of consultants and experts in the review – that there is at least as much evidence to support the use of the Wright approach as for the historical excess returns approach. The AER should have some regard to the Wright approach.

The *Final Omnibus* paper does not engage with CEPA's observations about the basis for the fixed MRP assumption or its recommendation that there is at least as much evidence to support the Wright approach.

Rather, it concludes that no weight should be applied to the Wright approach because that approach assumes a negative relationship between the risk-free rate and the MRP, and the AER considers that there is no widely accepted theoretical basis for such a relationship.[181]

The *Final Omnibus* paper does acknowledge the empirical evidence of a negative relation in the report it commissioned from CEPA, and it does acknowledge that ENA and QTC provided the AER with a theoretical rationale drawn from the relevant literature, however the AER has concluded that:

> *We acknowledge that stakeholders have put forward a theoretical basis, but it is not at a sufficient level for us to recognise a negative relationship.* [182]

Rather, the *Final Omnibus* paper cites prior work from McKenzie and Partington (2013) and Partington and Satchell (2016, 2020) to support its rejection of the Wright approach:

> *Some of our consultants [CEPA and Brattle, the consultants engaged as part of the current process] argued that we should recognise a negative relationship between the MRP and risk-free rate. However, we note previously other consultants we have engaged considered we should not recognise such a relationship.*[183]

ENA submits that there are a number of problems with the analysis on this point in the *Final Omnibus* paper:

- The lack of a well-accepted theoretical basis for a negative relationship between the MRP and risk-free rate is matched by the lack of a well-accepted theoretical basis for a zero relationship.
- CEPA has advised the AER that there is presently as strong a theoretical basis for a negative relationship as there is for a zero relationship. It is not clear why that advice should be rejected in favour of previous advice.
- A negative relationship is consistent with the empirical evidence reported in the CEPA report commissioned by the AER, whereas a zero relationship is not.

In terms of the historical approaches, reliance on the HER approach to the exclusion of the Wright approach embeds the assumption that the MRP is essentially fixed over time and has zero relationship with the risk-free rate. For the reasons set out above, ENA considers this position to be counter to the clear advice and recommendation of the consultant the AER commissioned to examine this issue and with

[181] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 60.
[182] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 63.
[183] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 58.

the advice of the majority of Concurrent Evidence experts. This evidence has not yet been addressed by the AER. It appears that different standards of assessment have been applied to the evidence for the HER and Wright approaches at this stage of the process.

Consequently, ENA considers it vital that the HER estimate must be augmented with other relevant evidence. If the Wright evidence is not used, it is even more important that real regard be given to the DGM evidence.

This is particularly important because the HER approach is a trailing average approach to the MRP and reflects the average MRP over the historical averaging period. In this regard, the AER has recently observed that:

> *Under a risk-free rate trailing average approach, the cost of equity would no longer reflect the cost of equity capital in the market at a given point in time and is therefore unlikely to best achieve the NEO.* [184]

Recommendation 12: Do not rely explicitly on HER evidence alone

The MRP allowance should not be set on the basis of the HER evidence alone. That approach embeds the strong assumption that the MRP is effectively constant over time, which is inconsistent with the evidence and advice before the AER.

Use the DGM evidence to select a point from within the range of HER estimates

ENA considers that the approach of using the DGM evidence to inform the selection of a point estimate from within the range of HER estimates has no merit and should be rejected.

The HER estimates are each an estimate of the average MRP over a different historical period (beginning in 1883, 1937, 1958, 1980 and 1988). Thus, the selection of one estimate or another from within this range of estimates simply amounts to the selection of the historical period over which the average is taken. There is clearly no basis for concluding, for example, that because the DGM estimate is currently high we should take the historical average from the period starting in 1958. Or that because the DGM estimate is currently low we should take the historical average from the period starting in 1980.

Rather, the differential weights that might be applied to the various historical periods should depend on the strength and quality of the data in each period and the extent to which the AER considers each period to be informative about the future expectations of investors.

The primary value of the DGM evidence is not in identifying which historical average might be more informative, but in identifying market conditions where the prevailing MRP might be different from the historical average. That is, the DGM evidence tells us when it might be appropriate to adopt an estimate above or below the historical average – it does not tell us when to start the historical averaging period.

[184] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 65.

Recommendation 13: Do not effectively rely on HER evidence alone

There is no basis for using DGM (or other) evidence to select an estimate from within the range of HER estimates. The primary value of the DGM evidence is not in identifying which historical average might be more informative, but in identifying market conditions where the prevailing MRP might be different from the historical average.

Use the DGM evidence alongside the HER evidence

ENA supports the approach whereby the AER has regard to the DGM evidence alongside the HER evidence.

The HER estimate is important evidence that establishes the long-run average MRP. The DGM approach then provides evidence about whether the prevailing MRP might be above or below this long-run average.

Two approaches would seem to be available for distilling these two pieces of evidence into a single MRP allowance at the time of the RoRI:

- Specify the relative weightings in a formula. For example, the IPART approach effectively applies 50% weight to each of the HER and DGM estimates; or
- Have real regard to both pieces of evidence when applying regulatory judgment to the selection of single MRP allowance.

The application of a fixed formula constrains the exercise of the AER's regulatory judgment. For example, the AER may wish to have regard, not just to a single current estimate from each approach but to a range of estimates, and it may also wish to have regard to recent volatility in estimates, and so on. Whereas it would be possible to codify such things in an expanded formula, that approach would quickly become very complex. It is also difficult to forecast all of the considerations that the AER may wish to take into account at the time of its decision.

The alternative is an approach whereby the AER has real regard to both sources of evidence at the time of the RoRI, applies its regulatory judgment at that time, explains the relative weight it has decided to apply to each source of evidence and the reasons for that weighting, and publishes an MRP estimate at the time of the RoRI. Such an approach would be analogous to the current AER approach to setting a final equity beta estimate, taking into account a number of estimates.

Our September 2021 submission sets out a framework for how the AER might exercise its judgment in distilling a range of evidence into a single MRP allowance.[185] ENA does not suggest that this is a formulaic or mechanical exercise. Rather, the various pieces of evidence and different estimates would each receive weight according to the AER's assessment of the strengths and weaknesses of that evidence.

The final issue is whether the RoRI MRP should be held fixed for the term of the RoRI or whether some formulaic updating or adjustment approach should be codified into the RoRI. Best practice regulation

[185] ENA, September 2021, *ENA response to equity omnibus paper*, section 4.7.

would allow the AER to apply its judgment at the time of each determination to select an appropriate MRP using the available evidence at the time of each determination. But that approach is not permitted under the 'Binding Instrument' legislation, in which case one of the above second-best approaches is required.

As noted above, ENA has previously suggested that the AER may wish to consider a simple updating formula whereby the MRP is linked to changes in the risk-free rate that occur during the RoRI period, but that approach has been rejected by the AER.

This leaves the AER with the options of either:

- Constructing a formulaic procedure that can be applied to update the HER and DGM estimates (and any other relevant evidence) and which also dictates how those estimates are weighted or otherwise distilled into a single figure; or
- Holding the RoRI MRP fixed for the life of the instrument.

Whereas the former approach would produce a more contemporaneous estimate at the time of each determination, it is also more complex. And whereas the latter approach is simple to embed into the Instrument, it runs the risk of becoming 'stale' during the 4-year RoRI period. Of course, the first-best approach would be for the AER to apply its judgment at the time of each determination to select an appropriate MRP using the available evidence at the time, but that approach is prevented by the relevant legislation.

ENA accepts that the complexity of codifying an updating mechanism into the RoRI may be the determining factor, in which case fixing the MRP for the duration of the RoRI would be the only viable option of those still under consideration by the AER.

Recommendation 14: Have real regard to all relevant evidence

ENA remains of the view that an approach that updates the MRP to reflect changes in the risk-free rate is most likely to produce internally consistent estimates of the allowed return on equity, but accepts that the AER has ruled out that approach.

The MRP allowance in the 2022 RoRI should be set by having real regard to all relevant evidence. The AER should apply its regulatory judgment, considering the strengths and weaknesses of each piece of evidence to produce an MRP allowance at the time of the RoRI.

Within the set of approaches that remain under consideration, ENA's view is that an approach that fixes the MRP for the duration of the RoRI is likely to be the only viable approach.

The potential role of survey evidence

During the Concurrent Evidence sessions, some experts raised the prospect of the AER having some regard to survey evidence.

ENA considers that the survey information is so unreliable that no reliance should be placed on it. Sample sizes are small and the estimates quickly become dated. There is no information about the qualifications of the respondents or their expertise or experience, or about the purpose or meaning of their MRP estimate. Rather, the authors simply tabulate the mean estimates of anyone who returns an emailed response. Moreover, there is no information about whether respondents would use their MRP figure to estimate the required return on equity, if so, whether they would use it in the SL CAPM, and, if so, whether they would make any other adjustments such as increasing the risk-free rate or by adding a

premium – as is the approach adopted in many independent expert reports. And it is unclear whether estimates include or exclude any assumed value of imputation credits.

ENA considers that these survey instruments cannot be described as "robust" or "credible" in any reasonable sense of those words. It is certainly not verifiable or timely. And it is not "comparable" in the sense that there is no indication of what respondents use their estimate of MRP for, or how they use it. Consequently, this data would appear to fail several of the AER's criteria for evaluating evidence.

The QCA has recently reviewed this survey evidence and concluded that it is so unreliable that no use can be made of it, citing a number of the problems set out above:

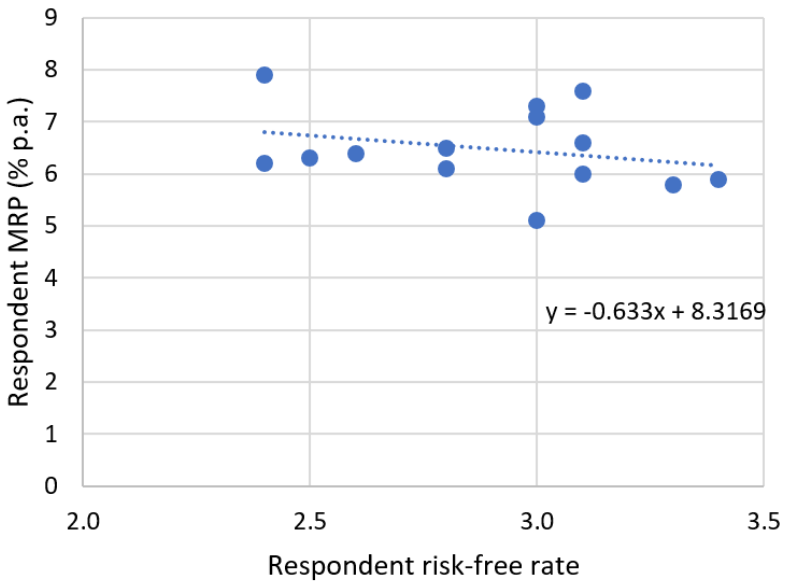
> *In past reviews, we have given weight to survey methods when determining a value for the MRP. These surveys attempt to estimate a future value for the MRP based on the survey responses from independent valuation experts, institutional investors, financial analysts, company managers and academics. Typically, when considering survey methods, we have used survey studies published annually by Pablo Fernandez and KPMG. We have also previously considered reports by independent analysts.*
>
> *Stakeholders raised a number of concerns with the use of survey methods to determine an MRP. The DBCT User Group submitted that MRP estimates from surveys are subjective because they depend on the participants who respond, and they may give information that is strategically the most beneficial to them. QTC submitted that a key problem with using surveys in a regulatory context is that surveys treat the MRP and the risk-free rate as independent parameters. Seqwater also raised concerns, including that:*
>
> *• surveys tend to have few respondents*
>
> *• the surveys quickly become dated and irrelevant*
>
> *• there is no information about the qualifications of respondents*
>
> *• surveys do not indicate what the respondents are using the MRP for.*
>
> *We are of the view that these are legitimate criticisms of survey methods. Furthermore, we note that, to the extent we use other methods to determine the MRP, and these are also commonly used by market practitioners in informing their views of an MRP, survey methods may not be providing any new or additional information. It is also not clear whether survey estimates of the MRP include an adjustment for imputation credits. Accounting for this possibility complicates the analysis of surveys.*
>
> *As surveys are only published once a year, the potential for these results to reflect out-of-date information is high if respondents use dividend discount models (or other forward-looking methods) to estimate the MRP. Outputs of dividend growth models are sensitive to changes in input values (which can move significantly over a span of months), meaning these survey results might reflect more of a historical view rather than the present view of the respondent.*
>
> *We therefore consider that including survey methods may not contribute meaningful or additional information that allows us to improve our determination of the MRP. As a result, we propose not to use them as part of future reviews.*[186]

[186] QCA, June 2021, *Rate of return review*, pp. 55-56.

In the event that some reliance *is* to be placed on survey responses, it is important to consider the *whole* of the response and not just a part of it. For example, the Fernandez and KPMG surveys indicate that respondents use risk-free rates well in excess of the prevailing yield on government bonds. Thus, it would be unsafe and misleading to pair survey MRP figures with the prevailing yield on government bonds when that is clearly not how the survey respondents use those MRP figures.

For example, Figure 5 below shows the relationship between the mean and median MRP figures and the corresponding mean and median risk-free rate figures reported in the Fernandez surveys. Survey respondents have paired higher estimates of the MRP with lower estimates of the risk-free rate, and vice versa.

Figure 5: Survey relationship between risk-free rate and MRP

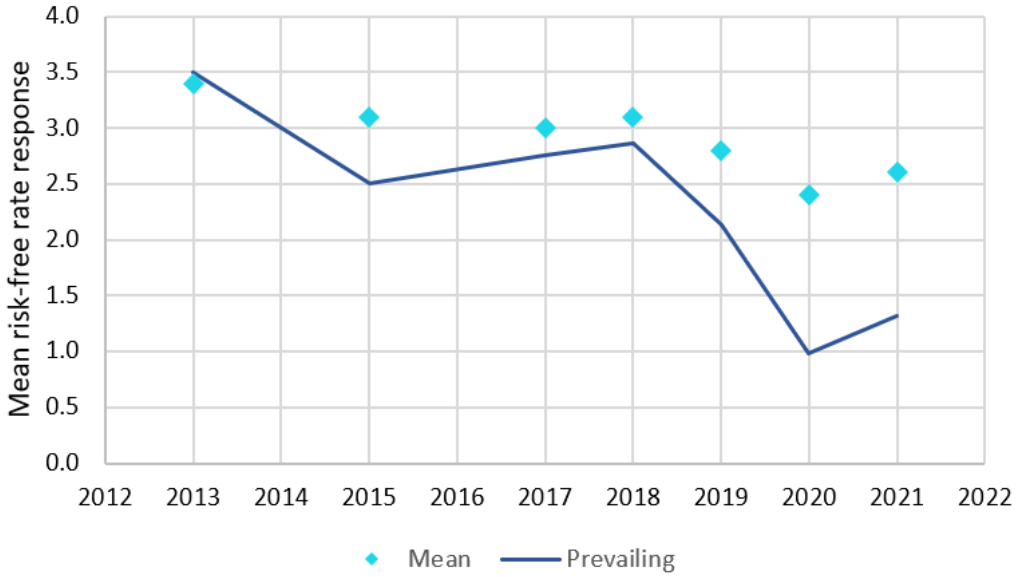


Source: Fernandez surveys; Frontier Economics calculations.

Moreover, the respondents to the Fernandez surveys have tended to maintain the risk-free rates that they adopt, even as 10-year government bond yields have fallen, as illustrated in Figure 6 below. The KPMG surveys also indicate that respondents currently adopt risk-free rates in excess of the prevailing government bond yield.

Thus, the MRP figures provided by these survey respondents are *not* paired with the prevailing risk-free rate, so it would be misleading to interpret them as though they were.

Figure 6: Survey responses on adopted risk-free rate vs. prevailing 10-year government bond yields



Source: Fernandez surveys; Frontier Economics calculations.

In summary, ENA considers that survey responses cannot usefully inform the estimation of the MRP or the relationship between the MRP and risk-free rate. However, if some reliance *is* to be placed on survey responses, it is important to consider the *whole* of the response and not just a part of it, and to consider contemporaneous and not historical surveys.

Recommendation 15: No survey evidence

Survey evidence is of such low quality that it should not be used to inform the estimate of the MRP. To the extent that survey evidence *is* used, it is important to consider the whole of the response and not just part of it, and to consider only contemporaneous surveys.

9 Equity beta

Key messages

- The fact that the AER's comparator set will have only a single live member at the time of the 2022 RoRI is clearly one of the most significant issues to be addressed by the AER during the 2022 review period. As the set of domestic comparators evaporates towards zero and becomes more and more out of date, it must logically receive less weight relative to the other evidence that is available.
- Other Australian and NZ regulators have recognised the problem of a very small set of domestic comparators and have regard to international comparators.
- Several other regulators report estimates of the equity beta of regulated energy networks. The ERA adopts a (like-with-like) equity beta of 0.79 and all others adopt equity betas above 0.8.
- ENA considers it reasonable to have some regard to this other relevant evidence as the confidence in the domestic comparators declines. We do not suggest that this other relevant evidence should be used in a formulaic or mechanical way, but rather that it may help to inform the exercise of the AER's regulatory judgment. It is difficult to see how one could have so much confidence in the reliability of the remaining domestic comparator evidence (now consisting of a single live firm whose comparability has previously been questioned by the AER) that no regard need be had to any other evidence.
- ENA also notes the well-accepted evidence of low-beta bias and proposes that this is relevant evidence that the AER should consider when exercising its judgment in setting the allowed return on equity.
- The AER should establish a substantive stakeholder consultation and review process focused on future methodology for beta estimation to commence following the 2022 RORI (in 2023).

9.1 The AER's preferred position on equity beta

The AER's preferred position on equity beta is summarised in its recent *Information Paper* as follows:

> *Under the current approach, we use a comparator set of nine Australian energy firms for estimating the equity beta for the benchmark business that provides the Australian regulated energy network services. Six firms have been delisted since the comparator set was initially established and currently there are three live comparator firms remaining (i.e. Spark Infrastructure, AusNet, APA). When determining our estimate range, we placed most weight on the longest period available data.*
>
> *Our preliminary position in the Overall rate of return omnibus final working paper is to maintain the 2018 Instrument approach to determining equity beta in the 2022 Instrument. This includes:*
>
> - *placing most weight on the longest period estimates,*
> - *retaining the existing comparator set,*
> - *continuing to set a single rate of return for gas and electricity network businesses, and*

- *not adjusting equity beta or the rate of return for a 'low beta bias'.* [187]

We have structured this chapter of the submission to respond to each of these issues in turn.

9.2 The time period used for estimation

ENA agrees with the AER's proposed approach of using a data period longer than the 2-5 years recommended by its consultants.

However, ENA recommends that the trade-off between statistical reliability on one hand, and recency and relevance on the other, is best managed by using data over a 10-year period.

There are two reasons why a firm's beta estimate might vary over time – because the true systematic risk of the firm varies, or due to random chance depending on the extent to which important firm-specific events during the sample period happen to occur in weeks when the market was up or down. In our September 2021 submission, we showed that beta estimates can double or halve depending on whether a single influential observation happens to occur in a period when the broad market is up or down.[188]

In this context, it is important to recognise that, even if the true systematic risk is perfectly constant over time, beta *estimates* can vary materially due to statistical noise. Thus, it is important to consider whether any observed changes in beta *estimates* are likely to reflect changes in the true systematic risk, or statistical noise. These problems become more severe as the sample of firms that are considered becomes smaller and smaller.

Consequently, judgement is required when interpreting beta estimates, and especially when considering the variation in beta estimates over time. For example, if there is reason to believe that the true systematic risk of a particular firm is likely to be quite stable over time, and if we observe substantial variation in the beta estimates over time, we would conclude that those beta estimates are likely to have been affected by random statistical estimation error described above.

Similarly, if a sample of comparators are all considered to have a similar degree of true systematic risk, but the beta estimates varied substantially between firms, we would conclude that the estimates have been affected by random estimation error. But there would be no way of determining which firms had been more or less affected.

One strategy for reducing the effects of estimation error is to increase the length of the sample period. In a longer period, it becomes more likely that some firm-specific events will occur during up markets and some during down markets such that the effects will tend to cancel out. We consider the optimal historical data period below.

Another strategy for reducing the potential impact of estimation error is to use a larger sample of firms. Whereas some firms may have beta estimates that have been negatively affected by random events, others may have estimates that have been positively affected. In a large sample of firms, these effects will tend to cancel out. We consider the appropriate sample of comparator firms in the following subsection.

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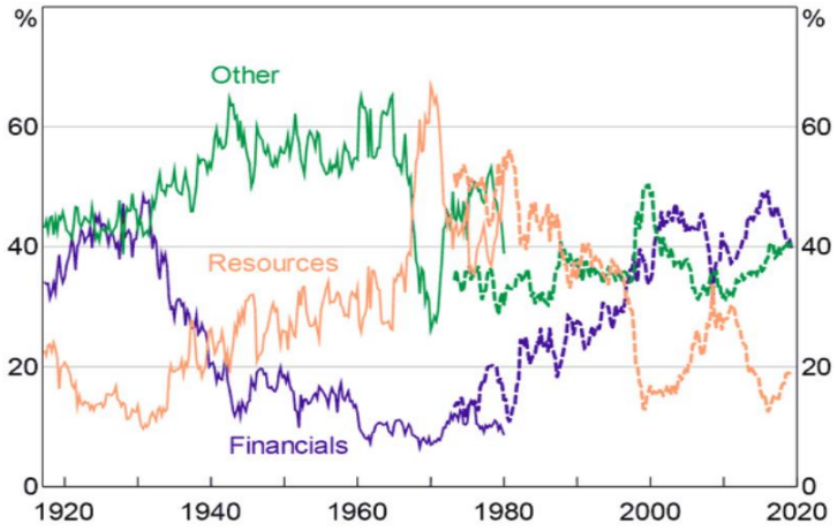
[187] AER, December 2021, *Rate of return: Information paper*, p. 22. As at the date of this report, there remains one live domestic comparator firm.
[188] ENA, September 2021, *ENA response to equity omnibus paper*, p. 72.

In our September 2021 submission, we noted that the AER's consultants have recommended that the most common practice is to examine historical periods of 2-5 years for each firm.[189] However, ENA would make the trade-off between recency and sample size by considering historical periods of 10 years.

In our September 2021 submission, we showed that beta estimates using 5 years of data tend to be unstable and volatile over time, more indicative of statistical estimation error than changes in the true level of systematic risk.[190]

At the other end of the spectrum, very long-term estimates using data going back to the 1980s is less likely to be reflective of the current level of systematic risk. In this regard, during the Concurrent Evidence sessions, Mr Kumareswaran presented the graph below showing the material changes in the composition of the Australian stock market over time.

Figure 7: ASX market capitalisation by sector



Source: Mathews, T., A History of Australian Equities, RBA Research Discussion Paper RDP 2019-04, June 2019, p. 16.

A 10-year term uses data from only the last decade and is long enough to smooth out much of the variability in estimates that are based on shorter periods. We note that the QCA has recently reached the same conclusion for the same reasons:

> *By using a longer time horizon of data, we consider that the impact of short-term events that might cause betas to move in different directions across countries is likely to be less pronounced. Furthermore, using a longer time horizon is likely to produce more stable results, which will allow for more regulatory certainty for stakeholders. Consequently, we consider that using 10 years of data to estimate beta is appropriate for our task. Using data any older may capture market information that is no longer relevant to estimating a current value for beta.* [191]

[189] ENA, September 2021, *ENA response to equity omnibus paper*, pp. 73-75.
[190] ENA, September 2021, *ENA response to equity omnibus paper*, pp. 78-84.
[191] QCA, June 2021, *Rate of return review*, p.66.

Recommendation 16: Use a long data period (10 years)

ENA agrees with the AER's preference for estimating beta using a longer data period than the 2-5 years recommended by some of its consultants.

ENA proposes that a 10-year period provides a reasonable balance between recency/relevance and statistical stability.

9.3 The appropriate comparator set

The (almost) complete evaporation of the AER's comparator set is a key issue that must be addressed in the 2022 RoRI

The fact that the AER's comparator set will have only a single live member at the time of the 2022 RoRI is clearly one of the most significant issues to be addressed by the AER during the 2022 review period.

By the time of the 2022 RoRI, Spark Infrastructure and AusNet Services will no longer exist as listed comparators. This leaves only APA Group, which has already previously accepted a takeover offer that was eventually blocked by the Foreign Investment Review Board,[192] and which is currently rumoured to be a potential takeover target.[193] Moreover, in 2018 the AER expressed concerns about the comparability of APA Group in light of its investment in unregulated gas pipeline assets.

Thus, the disappearance of the listed domestic comparator set is almost complete.

Since the 2018 RoRI, there have been two important developments in the domestic data available to the AER:

- Two of the three live comparators will no longer exist at the time of the 2022 RoRI; and
- The six comparators that were already delisted in 2018 have sunk even further into the sands of time, with beta estimates artificially frozen in time when they delisted.

These facts are clearly relevant to the weighing of the AER's comparators against other relevant evidence such as international comparators, other domestic infrastructure firms, and the decisions of comparable regulators. As the set of domestic comparators evaporates towards zero and becomes more and more out of date, it should receive less weight relative to the other evidence that is available.

ENA does not consider it to be reasonable to rely on a comparator set that has (at most) one live firm – to the complete exclusion of all other evidence.

To be clear, ENA agrees that the domestic evidence, including that from delisted comparators, is important and should receive significant weight. However, that weight should be reasonably proportional to the number of domestic comparators and the recency of the available data. As a data set shrinks and becomes more out of date, the reasonable approach is to afford it relatively less weight. One cannot reasonably have the same degree of confidence in a data set as it shrinks and becomes more out of date.

[192] See https://www.infrastructureinvestor.com/australia-rejects-ckis-apa-takeover-bid/.
[193] See, for example, https://www.theaustralian.com.au/business/dataroom/hunter-apa-may-become-a-target/news-story/9d462261d8db2e3719a01e426bebde1f.

As confidence in the AER's current comparator set is eroded, the question arises as to what other evidence is available to help inform the estimate of equity beta. Three additional sources of relevant evidence are available:

- International comparators;
- Domestic infrastructure businesses; and
- Betas adopted by comparable regulators.

The AER's acknowledgment of the need to have regard to evidence other than what remains of the domestic comparator set is as follows:

> *We acknowledge that we need to lay the foundation for future reviews to consider ways in which other information may be used.* [194]

ENA's view is that it is vital for the AER to clearly lay out what other evidence it considers to be relevant and how that evidence will be used, as other regulators have done (see below).

ENA considers that the three additional sources of evidence above are all relevant and can usefully inform the estimate of equity beta in the 2022 review. Our submission of September 2021 explains how we propose the AER would have proper regard to all of this relevant evidence.[195]

ENA does not consider it to be reasonable to rely on a comparator set that has (at most) one live firm – to the complete exclusion of all other evidence.

Recommendation 17: Unsafe to rely on a data set with a single live comparator

The 2022 RoRI should not rely exclusively on a data set that consists of one live comparator. It should explain what other evidence the AER considers to be relevant and how that other evidence will be given more weight as the quality of the domestic evidence on beta deteriorates.

On the relevance of international evidence, Dr Lally has noted that, even if a data source produces a biased estimate, giving some weight to that estimate can improve an imprecise unbiased estimate. That is, bias is only half of the consideration – precision (for which a reasonable proxy is quantum of available data) must also be considered. Thus, even if international data or old Australian data has some degree of bias (e.g., because the market composition might differ from the current Australian market) its use can improve the final beta estimate:

> *For example, suppose the local firms yield an unbiased estimator (generous to them) with a standard deviation of 0.15, the foreign firms yield an estimator with a bias of 0.15 and a standard deviation of 0.1 (lower than when using only local firms because of the larger set of companies). The MSE of the local estimator is then 0.15^2 whilst that of the foreign estimator is 0.18^2. The optimal weight on the local estimator is then 60%, and hence 40% weight on the foreign estimator. The MSE of this optimal estimator is then 0.115^2. This significantly outperforms exclusive use of local data.* [196]

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[194] AER, December 2021, *Rate of return: Information paper*, p. 22.
[195] ENA, September 2021, *ENA response to equity omnibus paper*, Section 6.10.
[196] https://www.aer.gov.au/system/files/Martin%20Lally%20-%20Some%20thoughts%20on%20the%20upcoming%20expert%20sessions%20-%2030%20January%202022.pdf, p. 5.

This point was explored in the Concurrent Evidence sessions via an analogy involving Cocker Spaniels. To the extent that there is very little data available about the size of Australian Cocker Spaniels, it would be logical to consider evidence about the size of Cocker Spaniels in other countries (international comparators), and other people's estimates of the average size of Cocker Spaniels (other regulatory estimates of beta for regulated energy networks). The weight that would be placed on that other evidence depends on the confidence that one has in the Australian data. As the available Australian data set became smaller and smaller over time, the other evidence would logically receive more weight.

A related issue that was raised during the Concurrent Evidence sessions was whether the use of international comparators would require an international CAPM to be adopted. The consensus among the experts was that it would not. ENA agrees with Dr Lally's conclusion on this point:

> *There's been a number of mentions in the AER's reports about the idea that if you use foreign beta estimates then necessarily you must be adopting an international CAPM. And I don't think that's right at all. Clearly, the Australian regulator is using a domestic CAPM. The betas are defined against the Australian market index. And if that set is sufficiently small, you might want to use foreign beta estimates, but those foreign beta estimates, for example from the United States, would be defined against the US index. In both cases, you're using beta estimates defined against their local market index. That is not an international CAPM.*[197]

Other regulators have recognised the problem and taken action

Other Australasian regulators have recognised the problem of relying exclusively on a very small set of domestic comparators. For example, the New Zealand Commerce Commission uses a large set of international gas and electricity transmission and distribution firms as its comparator set.

Similarly, the QCA has recently stated that:

> *We consider that continuing to use an international sample of firms (alongside domestic firms) is preferable, as relying purely on Australian firms to form comparator sets for the entities subject to our regulatory regime is problematic. We are not confident that there are a sufficient number of listed Australian firms for us to draw upon in order to determine reasonable betas. In particular, any industry sample would comprise a very small number of firms, which could result in beta estimates fluctuating by large margins from review to review. This does not provide regulatory predictability.*
>
> *An advantage of using a larger sample of firms is that the impact of any one seemingly anomalous beta estimate is not significant when taking an average or median beta from all the firms in the sample. This would not be the case when relying on a very small sample of firms. The potential loss of comparator firms from delisting as a result of mergers and acquisitions would only exacerbate the above issues.*[198]

The QCA has also concluded that, although there are some differences between international and domestic firms, the international firms are likely to be broadly similar in terms of their risk profile:

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[197] https://www.aer.gov.au/system/files/AER%20-%20Concurrent%20Evidence%20Session%201%20-%20Proofed%20Transcript%20-%20February%202022.pdf, p. 84.
[198] QCA, December 2021, *Rate of return review: Final report*, pp.71-72.

> *Despite these differences, we would expect many of the international energy firms to have broadly similar operational risks as a regulated energy business operating in Australia, such as Jemena or Ausgrid.* [199]

And further that:

> *This arrangement is not dissimilar to regulated energy businesses in Australia that operate transmission and distribution infrastructure within specified areas as monopolists.* [200]

The QCA has also observed that a number of international regulatory regimes share many of the same key features as the Australian framework:

> *Additionally, while there may be differences in regulatory frameworks across countries, we generally find that most international regulated energy businesses are regulated in such a manner that allows them to recover their efficient costs, including a return on capital commensurate with the risks they face. Many businesses are allowed to recover costs where they depart from forecast levels and some have 'decoupling' mechanisms that allow the business to recover revenue independent of volume—similar in effect to a revenue cap.* [201]

IPART has also concluded that a broad sample of firms, including international firms, should be included in the comparator set:

> *We agree that a broad sample method is more objective, more likely to yield statistically reliable estimates, and more resistant to problems caused by companies dropping out of the sample over time (for example, because they become de-listed).*[202]

The ERA is also now proposing to broaden its comparator set to include international firms. The ERA has highlighted the obvious problems of having a comparator set with only a single live firm:

> *The ERA holds some concern with the use of such a small sample, including that:*
>
> - *A forward-looking equity beta requires live firms that can incorporate information into prices, where historical estimates cannot incorporate information due to being delisted.*
> - *A sample that is largely reflective of one firm deviates from a benchmark approach to an actuals approach.*
> - *A sample largely reflective of one firm also may be statistically unreliable.* [203]

The ERA also notes its concern that the one remaining comparator – APA Group – may be de-listed in the future leaving a null set. [204]

The ERA then identifies a number of advantages of broadening its comparator set to include international firms:

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[199] QCA, December 2021, *Rate of return review: Final report*, p.72.
[200] QCA, December 2021, *Rate of return review: Final report*, p.72.
[201] QCA, December 2021, *Rate of return review: Final report*, pp.72-73.
[202] IPART, February 2018, *Review of our WACC method: Final report*, p.7.
[203] ERA, December 2021, *2022 gas rate of return instrument review: Discussion Paper*, p. 72.
[204] ERA, December 2021, *2022 gas rate of return instrument review: Discussion Paper*, p. 73.

The ERA considers that the international sample option has the following advantages:

- *An extended sample size could result in equity beta estimates that are more reliable and less sensitive to individual equity beta estimates of the Australian energy network sample.*
- *Using international samples could be a more robust approach over time, given the decreasing number of listed Australian energy networks.*
- *Other regulators have been using international comparators for their equity beta estimation, largely driven by the difficulty in finding a sufficient number of comparable businesses to estimate equity beta using a purely domestic sample.* [205]

The ERA further notes that, where regulators have regard to international firms, they all estimate beta in the standard way via regression analysis against the local market index. None use an international CAPM. None make any adjustment for any perceived differences between markets.

The ERA then concludes that:

On balance, given the smaller Australian domestic sample, as a working view the ERA considers that examining both domestic and international listed energy networks may be useful when estimating the equity beta for Australian energy networks.

The ERA proposes to use the following method:

- *To use a domestic CAPM model for each country to estimate the equity beta.*
- *The use of an international CAPM would introduce complexity without substantial benefits as it relies on stronger assumptions than the domestic CAPM*
- *To only include firms where the majority of the observations are present in the estimation window.*
- *Consistent with the manner in which domestic equity beta estimates are unlevered and re-levered to the benchmark gearing level, international equity beta estimates will also undergo the same procedure.* [206]

Beta estimates adopted by comparable regulators is relevant evidence

The beta estimation task is common to many regulators around the world. Many other regulators face the same challenge as the AER – a small set of domestic comparators that produce variable and inconsistent estimates. This led the AER to compute and report the equity betas adopted by a number of comparable regulators in its December 2020 working paper on international regulatory approaches.

The AER stated that:

to allow for a consistent comparison[207]

betas would have to be re-levered to 60% gearing, such that:

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[205] ERA, December 2021, *2022 gas rate of return instrument review: Discussion Paper*, p. 75.
[206] ERA, December 2021, *2022 gas rate of return instrument review: Discussion Paper*, p. 76.
[207] AER, December 2020, *International regulatory approaches to rate of return: Final working paper*, p. 26.

we have adjusted equity beta to align with the AER's approach.[208]

Our September 2021 submission identified an error in the AER's re-levering calculations and presented the correct figures. In particular, the AER appears to have mis-estimated the re-levered beta estimates by replacing the standard measure of gearing of $\frac{D}{V}$ with $\frac{D/V}{1+D/V}$. Since the AER has not yet responded to this issue, we show the corrected figures in Table 5 below so they can be considered prior to the Draft Instrument.

Table 5: Corrected international regulatory beta allowances

Regulator	Original equity beta	Gearing	Correct re-levered equity beta
ACM	0.74	50%	0.93
FERC	0.84	60%	0.84
STB	1.11	17%	2.31
ARERA	0.71	44%	0.99
NZCC	0.6	42%	0.87
NZCC*	0.65	42%	0.94
Ofgem	0.76	55%	0.86
Ofgem*	0.71	55%	0.80
Ofwat	0.71	54%	0.81
Ofwat (CMA)	0.76	54%	0.87

Source: Equity betas re-levered in the standard manner by multiplying by (1-gearing) and dividing by 0.4.

ENA notes that the corrected equity betas are all above 0.8.

In addition, the ERA of WA performed the same beta estimation exercise at the same time as the AER in its 2018 Guideline. Examining the same set of evidence as the AER, and operating in an identical regulatory jurisdiction, the ERA of WA adopted an equity beta (re-levered to 60%) of 0.79 in its 2018 Guideline.

[208] AER, December 2020, *International regulatory approaches to rate of return: Final working paper*, p. 26.

The ERA has adopted the same equity beta as the preliminary position for its 2022 Guideline. [209]

That is, among other regulators, the lower bound of equity beta allowances is in the order of 0.8 – one third higher than the allowance of the AER in 2018.

ENA submits that:

- The judgment that the AER has applied in assessing the domestic evidence has led to an equity beta allowance markedly out of step with other comparable regulators. ENA considers that this is important evidence in assessing the confidence that can reasonably be placed in the AER's 2018 approach of setting the equity beta based on its assessment of the available domestic comparators.
- The equity betas adopted by regulators of energy network businesses (FERC, NZCC, Ofgem, ERA WA) is relevant evidence that should be used to inform the AER's beta allowance. These are direct estimates of equity beta adopted by comparable regulators in comparable jurisdictions for comparable businesses. They are all used for the same purpose – estimating the allowed return on equity using the SL CAPM.
- The AER has recently explained that other regulators have regard to different data and may use different methodological variations.[210] This is precisely the reason that such evidence has probative value – it shows how comparable regulators have assessed the available data differently from the AER, applied their regulatory judgment, and reached materially different conclusions. There would be little point in constraining consideration to regulators who applied the same methods to the same data – because they would produce the same results, by definition.
- A key piece of evidence is that the ERA, which is performing a task identical to the AER, has adopted an equity beta that is in line with (albeit at the lower end) the figures adopted by the comparable international regulators.

To be clear, ENA does not suggest that the equity betas adopted by international regulators should supplant the consideration of other evidence or be used in any formulaic way. Rather ENA simply proposes that this is relevant evidence to which the AER should have proper regard.

ENA submits that having no regard at all to the equity betas adopted by comparable regulators for comparable businesses is an extreme position. This is particularly the case when all comparable regulators have adopted equity betas that are very materially higher than the AER's allowance.

Recommendation 18: Have regard to the approaches adopted by comparable regulators

When setting the equity beta, the AER should have regard to the approaches and estimates of regulators performing a comparable task. Comparable regulators have regard to a broader set of evidence and have set equity beta allowances very materially higher than the AER's current figure.

[209] ERA, December 2021, *2022 gas rate of return instrument review: Discussion Paper*, pp. 28, 85.
[210] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 111.

9.4 A single rate of return for gas and electricity network businesses

ENA notes that it is impossible for the AER to differentiate between the betas for gas and electricity or between distribution and transmission business using its preferred set of domestic comparators. The set of domestic comparators is already so small, and so quickly evaporating, that it is impossible to empirically differentiate between the beta for gas networks and the beta for electricity networks. Consequently, the only means of compiling different betas for gas and electricity networks would be to make some sort of arbitrary adjustment, which is unsatisfactory.

This does not suggest that gas and electricity business are identical in terms of risk and required returns – just that any differences are impossible to reliably quantify using the available data.

For example, it is well-known that many gas networks face a much more uncertain future than electricity networks as the pace of decarbonisation intensifies. However, these risks and issues can be addressed elsewhere in the regulatory process (e.g., via depreciation allowances) rather than via an inevitably arbitrary adjustment to the beta allowance. The AER has noted that it is currently engaging with stakeholders in a separate process on regulating gas pipelines under uncertainty.[211]

Alternatively, having regard to international firms creates larger sets of gas and electricity comparators that may provide an empirical basis for separately estimating the beta for each type of firm.

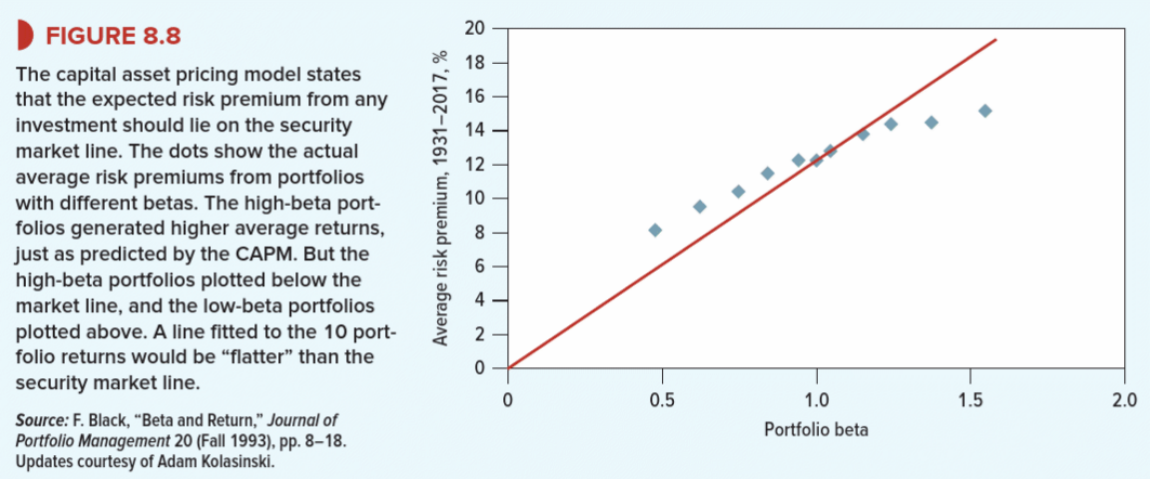
9.5 Low-beta bias

There is a large body of evidence demonstrating that returns on low-beta stocks are systematically higher than the Sharpe-Lintner CAPM predicts. Indeed, this is one of the most significant, consistent and well-accepted pieces of evidence in the empirical asset pricing literature. The contributors to this literature include two Nobel Prize winners, the studies documenting low-beta bias have been published in the very top finance journals over several decades, and the empirical evidence of low-beta bias appears in the standard finance textbooks.

For example, the well-known Brealey, Myers and Allen textbook illustrates this empirical evidence in Figure 8 below. Stocks with a low beta estimate generate higher returns than the CAPM would predict. This evidence is consistent across developed markets and, if anything, is becoming more pronounced over time.[212]

[211] AER, December 2021, *Rate of return: Information paper*, p. 23.
[212] Brealey, R.A., S.C. Myers, and F. Allen, 2020, *Principles of Corporate Finance,* 13th ed., McGraw-Hill Irwin, p. 211.

Figure 8: Empirical evidence of low-beta bias



Source: Brealey, R.A., S.C. Myers, and F. Allen, 2020, Principles of Corporate Finance, *13th ed., McGraw-Hill Irwin, p. 210.*

Brealey, Myers and Allen observe that:

> *While high-beta stocks performed better than low-beta stocks, the difference was not as great as the CAPM predicts.* [213]

and that:

> *Expected returns do indeed increase with beta, though less rapidly than the simple version of the CAPM predicts.* [214]

A summary of the extensive literature on this point is available in the Frontier Economics report of September 2018.[215]

There appears to be no real contention about the robustness or pervasiveness of this empirical evidence, but there is a difference of views about its relevance to the regulatory process.

ENA submits that the AER should have regard to this evidence when exercising its judgment to set the allowed return on equity. This is because returns on low-beta stocks are higher than the simple version of the CAPM predicts. ENA does not suggest that this evidence should be used to make any particular adjustment to beta or any other CAPM parameter. Rather, ENA suggests that it should be a relevant consideration that the simple version of the CAPM that the AER uses has been shown to systematically understate the returns of low-beta stocks. ENA suggests that this is relevant evidence for the AER to consider when exercising its judgment in setting the allowed return on equity.

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[213] Brealey, R.A., S.C. Myers, and F. Allen, 2020, *Principles of Corporate Finance,* 13th ed., McGraw-Hill Irwin, p. 210.
[214] Brealey, R.A., S.C. Myers, and F. Allen, 2020, *Principles of Corporate Finance,* 13th ed., McGraw-Hill Irwin, p. 210.
[215] Frontier Economics, September 2018, *Low-beta bias and the Black CAPM*, https://www.aer.gov.au/system/files/Attachment%202%20-%20Frontier%20-%20Low%20beta%20bias.pdf.

However, the AER's proposed position is to have no regard to this evidence in any part of its process. The reasons set out by the AER in its Final Omnibus Paper, [216] and ENA's response to each, is as follows:

- *It is not clear that this evidence should be used to make an adjustment to the beta parameter.*

  ENA does not propose that this evidence should be used to adjust beta or any other parameter, just that it should be a relevant consideration that the simple version of the CAPM that the AER uses has been shown to systematically understate the returns of low-beta stocks. This is relevant evidence for the AER to consider when exercising its judgment in setting the allowed return on equity.

- *It is not clear that market practitioners have regard to this evidence when estimating required returns.*

  By contrast, Economic Insights has provided the opposite advice to the AER – that industry practice is to adopt a higher rate of return for low-beta stocks than a mechanistic application of the CAPM would suggest. Economic Insights also cites evidence showing that "the independent experts' judgment is right":

  > ***…estimates of beta obtained from regression analysis are a starting point, not the end point, for estimating beta****. A review of industry practice and academic studies supports the above interpretation. SFG Consulting, in its (2013) report "Evidence on the required return on equity from independent expert reports" observes that* ***independent experts' estimates of expected return for a set of low beta companies were higher than the estimate yielded by a mechanistic application of the model****. In other words, the experts estimated that the CAPM-based valuation was too high for the stocks. Strikingly, in their paper "CAPM-based company (mis)valuations", Dessaint, Olivier, Otto, and Thesmar (2021) report findings that suggest* ***the independent experts' judgement is right****. The implied valuation of low-beta stocks when beta is estimated mechanistically is too high.* [217]

- *Low-beta bias shrinks to insignificance when estimated over longer time horizons.*

  This claim was based on a reference by Partington and Satchell to a single academic study by Gilbert et al. (2014).[218] As an earlier ENA submission explained[219], Gilbert et al (2014) contains no reference to low-beta bias. That paper is not about low-beta bias and it does not claim to have any implications for low-beta bias. The paper contains no Fama-MacBeth regressions (the methodology that is used to estimate low-beta bias), and it cites none of the many papers that have documented low-beta bias. The empirical analysis using real-world data does not consider the relationship between stock returns and beta estimates at all.

  In other words, Partington and Satchell's reference to Gilbert et al. (2014) as evidence that the low-beta bias phenomenon shrinks to insignificance with longer holding periods is a misreading of the study. What Gilbert et al. (2014) find is that estimates of the CAPM 'alpha' (i.e., the extent to which a stock outperforms/underperforms the return on the market as a whole) tend to be large and positive when betas are estimated using daily returns data, but tend to be much smaller when betas

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[216] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 118.
[217] Economic Insights, June 2021, *Methodological issues in estimating the equity beta for Australian network energy businesses*, p. 28, emphasis added.
[218] Gilbert, T., Hrdlicka, C., Kalodimos, J. and Siegel,S., 2014, *Daily data is bad for beta: Opacity and frequency dependent betas*, Review of Asset Pricing Studies, 4, 78-117
[219] ENA, *Best-practice framework for setting the allowed return on equity: Response to AER's Pathway to 2022 Rate of Return Instrument: Return on Equity Working Papers*, 9 October 2020, p. 28

are estimated using quarterly returns data. This finding has nothing to do with the question of whether the CAPM tends to underestimate the required return for low-beta stocks.

» *Even though the CAPM systematically understates the returns of low-beta stocks, it may still be appropriate to use the CAPM for regulatory purposes because regulated assets have low betas:*

> *Despite the low beta bias issue, the CAPM may still be appropriate for regulated monopolies, because the monopoly nature of the firm and the regulatory arrangements provide strong stability in the cash flows and low revenue and profit risk, and hence low beta.* [220]

This argument has no clear logical basis. It is precisely because regulated assets have low betas that low-beta bias is a relevant consideration.

Recommendation 19: Have regard to the evidence of low-beta bias

The AER should have regard to the established empirical evidence of low-beta bias when exercising its judgment in setting the allowed return on equity.

9.6 Estimation difficulties in unique times

ENA notes that the period since the 2018 Guideline has been characterised by two major events, insofar as equity beta estimation is concerned: the COVID pandemic and the market activity that has resulted in the de-listing of two of the three remaining comparator firms.

The ERA has recently observed that:

> *Since the 2018 gas instrument Australian markets have been affected by the COVID-19 pandemic and merger announcements, and these market developments have affected the three remaining listed energy networks. As the equity beta measures the correlation of a firm to the broader market, both changes in the returns of a firm and the returns to the market can affect an estimate. The ERA notes that these market events affect the empirical estimates of equity beta in Australia.* [221]

In relation to merger activity, the ERA notes that:

> *Besides reducing the number of live firms through delisting a company, an acquisition transaction may affect the informativeness of returns around the announcement window and towards close.*
>
> - *A firm's price that is subject to a takeover will be affected by the timing of acquisition news. This effect on the firm's price will affect its covariance with the market return. Acquisitions are generally subject to large premiums on the current market price.*
> - *Similarly, a firm's price post acquisition announcement may also be abnormal.*
> - *It is likely price changes post announcement reflect changing expectations of takeover success.*

[220] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 118.
[221] ERA, December 2021, *2022 gas rate of return instrument review: Discussion Paper*, p. 78.

- *An announced target price could create a floor and ceiling that reduces the price informativeness of future trading given the convergence of the share price to the offer price conditioning on success.* [222]

ENA agrees with this assessment and notes that equity beta estimates will tend to be downwardly biased if the market considers that a transaction is likely to complete. In this case, the stock price is likely to reflect the present value of the offer price, rather than the market's assessment of the fundamental value of the business. That is, whether the market might rise or fall by 5% has little impact on the value of stock that will be bought out for a known price three months hence.

In summary, since 2018:

- There is no new data in relation to six of the AER's nine domestic comparators – because they were already de-listed; and
- The remaining live comparators (of which one remains) have been significantly affected by transaction activity.

It is difficult to see how the AER could reasonably have much confidence in the additional data that has become available for its domestic comparators since 2018.

9.7 Next steps

ENA's view is that the first principle of parameter estimation is that real regard must be given to all of the relevant evidence. By contrast, the AER's preliminary position suggests that only a single subset of the evidence will have any impact on the allowed equity beta.

ENA considers it reasonable to have some regard to this other relevant evidence as the confidence in the domestic comparators declines. We do not suggest that this other relevant evidence should be used in a formulaic or mechanical way, but rather that it may help to inform the exercise of the AER's regulatory judgment.

ENA considers it important for the following points to be addressed in the Draft Instrument decision. In particular, the Draft Instrument decision should:

- Clearly lay out what other evidence the AER considers to be relevant and how that evidence will be used, in light of the AER's recognition of the need to "lay the foundation for future reviews to consider ways in which other information may be used." [223]
- Not rely exclusively on a data set that consists of one live comparator.
- Explain what other evidence the AER considers to be relevant and how that other evidence will be given more weight as the quality of the domestic evidence on beta deteriorates.
- Have regard to equity betas adopted by comparable regulators for comparable firms – particularly in light of the very material difference between the AER's beta allowance and that of all other regulators.
- Have regard to equity beta estimates for international comparators – particularly in light of the broad acceptance of that evidence by other regulators.

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[222] ERA, December 2021, *2022 gas rate of return instrument review: Discussion Paper*, p. 79.
[223] AER, December 2021, *Rate of return: Information paper*, p. 22.

Recommendation 20: Have regard to all relevant evidence, including international comparators

When setting the equity beta, the AER should have regard to evidence from domestic and international comparators and the approaches and estimates of regulators performing a comparable task.

9.8 Proposed approach: having regard to a range of evidence to derive a beta estimate

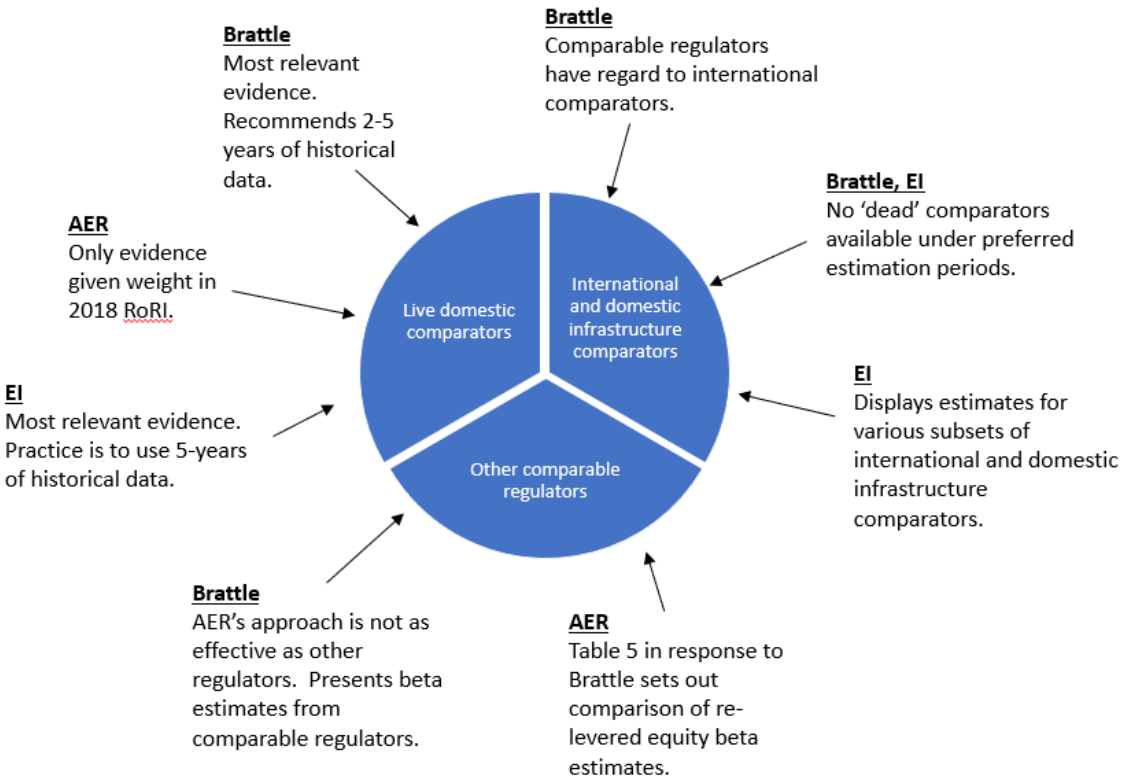
The AER has asked stakeholders for concrete proposals about how to distil a range of evidence and estimates into a single beta allowance to be adopted in the RoRI. ENA recognises that this exercise will inevitably require the application of regulatory judgment and our September 2021 submission[224] sets out a framework for how this judgment might be applied.

ENA's view is that the first principle of parameter estimation is that real regard must be given to all of the relevant evidence. When setting the equity beta in the RoRI, the relevant evidence includes domestic comparators, estimates adopted by other regulators performing a similar task, international comparators and domestic infrastructure firms – for the reasons set out above.

ENA's proposed approach to estimating equity beta is strongly guided by the material commissioned and prepared by the 2022 AER as part of the current review process, as illustrated in Figure 9 below.

[224] ENA, September 2021, *Estimating the cost of equity*.

Figure 9: Proposed approach for estimating equity beta



Considerations and illustrative example

In our September 2021 submission, we recommended that:

- No weight should be placed on the 'dead' comparators. That evidence is too dated, variable and inconsistent to have any real informative value.
- For the three remaining domestic comparators, ENA recommends that the trade-off between sample size (statistical precision) and recency (relevance) is best achieved by considering estimates computed over a 10-year period rather than periods of 2-5 years.
- It is unsafe to rely exclusively, or primarily, on the very small (and shrinking) set of domestic network comparator firms.
- Material weight should be applied to the estimates adopted by other comparable regulators. ENA considers that this is important evidence in assessing the confidence that can reasonably be placed in the AER's 2018 approach of setting the equity beta based on its assessment of the available domestic comparators.
- Material weight should be applied to the estimates from international comparators. ENA considers that this is important evidence in assessing the confidence that can reasonably be placed in the AER's 2018 approach of setting the equity beta based on its assessment of the available domestic comparators.

- Some weight should also be applied to the estimates from other domestic infrastructure service providers, however ENA considers this evidence to be less directly relevant than the international energy network comparators.
- Asset betas should be re-levered to ensure that the resulting equity beta is consistent with the AER's gearing parameter.

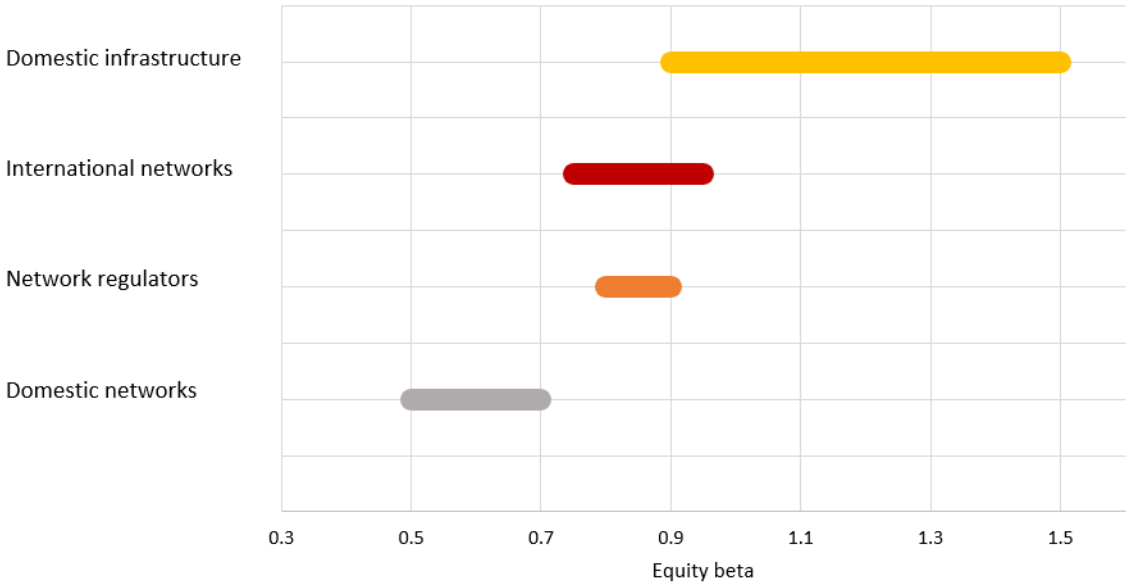
To illustrate how the relevant evidence might be combined our September 2021 submission considered some indicative estimates. The purpose of using these indicative estimates is simply to illustrate the process by which a range of evidence might be distilled into a single regulatory allowance. The range of evidence that we considered in our September 2021 submission is as follows:

- The 10-year equity beta estimates for domestic network parameters range between 0.5 and 0.9. The mean OLS estimate is 0.6 and the mean LAD estimate is approximately 0.7.
- Other regulators of energy transmission and distribution networks have adopted equity betas primarily in the range of 0.8 to 0.9, as set out in Table 5 above.
- The international comparators (re-levered to 60% to ensure a like-with-like comparison) primarily lie in the range of 0.75 to 0.95.
- Evidence from other domestic infrastructure service providers supports a range of 0.9 to 1.5 or above.

Again, ENA does not suggest that these figures are anything more than indicative, and that work will have to be done throughout the 2022 RoRI process to select an appropriate set of comparators. Also, we have simply taken the range of point estimates from each of the estimation samples. The AER might also have regard to statistical precision by considering standard errors, which would widen each of the ranges below. Again, the figure below is designed to simply illustrate the process by which the AER might distil various pieces of evidence into a single figure for regulatory purposes.

The ranges supported by the various sets of indicative evidence are summarised in Figure 10 below.

Figure 10: Equity beta ranges



Source: Equity beta ranges, all figures re-levered to 60%. Indicative figures only. To be updated through 2022.

In assessing the evidence that is summarised above, we noted that the domestic network evidence is the most comparable, but the least reliable – due to the very small (and decreasing) set of comparator firms. It is for this reason that material weight must be given to the other relevant evidence.

ENA does not consider it appropriate to use the AER's domestic network comparators (or comparator, as the case may be) to fix the boundaries of a primary range, relegating the other evidence to the role of informing the selection of a point estimate from within that range. The domestic network evidence is not of sufficient magnitude or precision or quality to enable all of the other evidence to be relegated to a type of cross check role.

Indeed, the purpose of considering all relevant evidence is to identify, as Figure 10 does, whether the statistical estimates from the remaining domestic network firms might be out of step with the weight of other relevance. In this regard, we note the recommendation from Economic Insights that the statistical estimates of beta are just the starting point, and should not be mechanically adopted. [225]

ENA's view is that the above evidence would support an equity beta in the range of 0.7 to 0.75. We note that this small range:

- Is at, and slightly above, the range from the statistical estimates for the remaining domestic network comparators;
- Below the range adopted by other energy network regulators;
- At, and slightly below, the range from the statistical estimates for international energy networks; and
- At, and somewhat below the range from the statistical estimates for other domestic infrastructure service providers.

ENA provides this as an example of how judgment might be exercised in the selection of an appropriate equity beta after having proper regard to all of the relevant evidence.

Finally, we again note that ENA provides these sample calculations as an indication of the type of process that could be used to distil the relevant evidence into a single point estimate, and in response to the AER's request for concrete proposals. Clearly, the figures will need to be updated at the time of the 2022 RoRI.

[225] Economic Insights, June 2021, *Methodological issues in estimating the equity beta for Australian network energy businesses*, p. 28, emphasis added.

10 Use of the industry debt index

Key messages

- The AER's analysis of network debt data indicates that:
  - There have been some periods of network under-performance and some periods of network outperformance.
  - Average outperformance has been 4 basis points, with a standard error of 15 basis points.
- CEG reaches similar conclusions on the same data. CEG estimates between 0bp (tenor weighted) and 11bp (tenor and value weighted) under-performance.
- Both the AER and CEG estimate *under*-performance in the most recent period since July 2017. The historical period of outperformance is concentrated in the 2016 calendar year.
- Since the residual outperformance is neither material nor persistent at this time, there is no basis for any adjustment in relation to it. Rather, the evidence shows that the current benchmark approach using independent third-party data sources is performing well and that the AER has almost perfectly achieved the target of zero outperformance.
- Applying a cap to the AER's regulatory allowance (in relation to the episode of outperformance in 2016) would create a clear bias to negative outperformance. To see this, imagine retrospective application of such a cap. This would serve to reduce measured outperformance in one short historical period (CY 2016). But removing outperformance in this period would result in overall outperformance becoming negative using the AER measurement (and even more negative using the CEG measurement method).
- Applied prospectively, the results could be even more biased. The empirical justification for a cap is that there was outperformance in a single year (CY2016) when general credit spreads were high. That is, there was a unique period when there was a divergence between NSP and general credit spreads. This is not a safe basis to assume that such divergence will always exist in the future when general credit spreads are high.
- The cap approach would only make sense if the AER was targeting net under-performance – an outcome where, on average, the regulatory allowance is lower than the actual costs incurred by networks.

10.1 Lack of residual outperformance

The *Information Paper* notes that:

> *Residual outperformance (after accounting for departures on credit rating and term) was modest, at an average of approximately 4 basis points. This residual outperformance is predominantly evident when the benchmark credit spread increases above a certain level, suggesting debt raised by the privately-owned regulated service providers may be insulated from the high average risk premiums that are evident at times in the secondary market.*

However it is not clear that this residual outperformance is material and persistent outperformance that needs to be adjusted for at this time. [226]

In summary, the conclusion from the AER's analysis is that the benchmark allowance is within 4 basis points of the actual costs incurred by networks.

ENA considers that the appropriate conclusion from this analysis is that the current benchmark approach is working as well as could possibly be expected. By any metric, 4 basis points is negligible and clearly well within the bounds of estimation error.

The ENA also notes that, based on CEG's estimation method, the average outperformance is even less than 4bp and, in fact, is generally negative. CEG estimates of the average outperformance are summarised below (and the method is detailed in the notes to the table).

Table 6: Average outperformance (bp) relative to matched credit rating and to matched term

Years of data to 30 June 2021	1	2	4	6	8
	Under/outperformance (-ve/+ve)				
Tenor and value weighted	-17	-11	-8	-2	-11
Tenor weighted	-10	-4	-5	3	-1

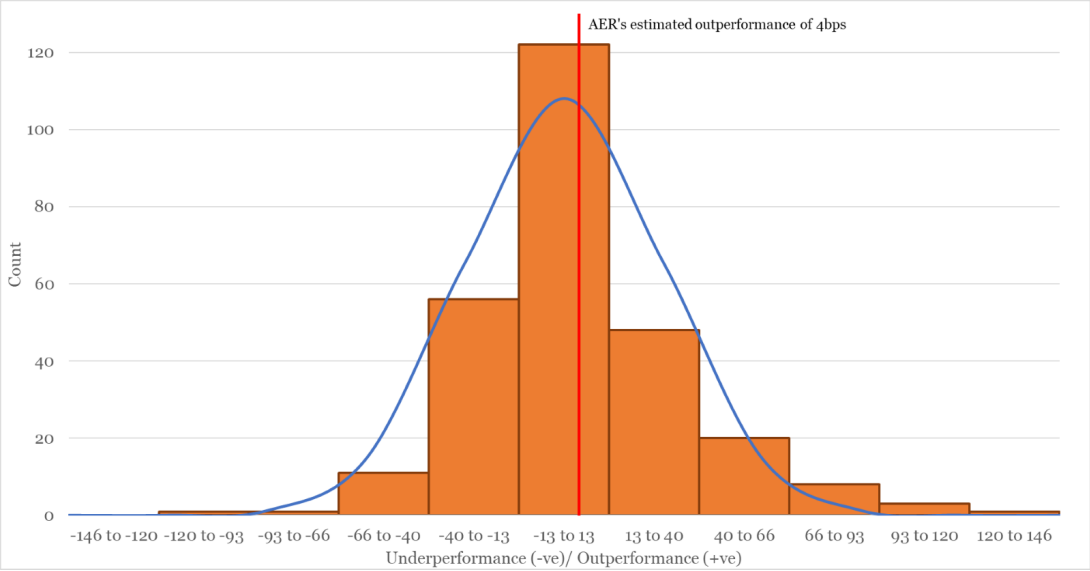
Source and note on preparation: CEG analysis of NSP data. Includes all APA debt issues (the AER indicates that some APA debts are excluded but it is not clear which). Excludes subordinated bonds issued by AusNet. Calculation method is to compare the credit spread on each instrument with the tenor and credit rating matched credit spread from Bloomberg/ Reuters/RBA on the pricing date of that instrument. The AER appears to do the same. However, the AER appears to then group these instruments into 12-month averages to create a rolling average of 12-month estimates. This gives every 12 months the same weight no matter how many observations are included. By contrast, CEG simply takes an average across the entire time period – which means the weight given to instruments in the overall estimate is not a function of how many bonds were issued in the same 12 months. Similarly, the AER method appears to give least weight to the first and last 12 months in the series (as bonds issued early/late in these years enter fewer 12 month rolling averages). The CEG method gives these bonds the same weight as bonds issued in the middle of the estimation period.

CEG's estimate is that there has been underperformance in most periods. When the observations are only tenor weighted, the average outperformance over the last 8 years is -1bp. Moreover, consistent with the AER's own analysis (reproduced in Figure 11 below), this mostly occurs in a narrow window of time around CY2016. The average outperformance over the last 4 years (1 July 2017 to 1 July 2021) is negative 5 bp (underperformance). When CEG weights by both tenor and value then outperformance is negative in all periods.

However, the underperformance estimated by CEG is, like the AER's estimate, not materially different to zero. This is illustrated by plotting the AER estimate relative to the distribution of all observations for debt issues over the 6 years to June 2021.

[226] AER, December 2021, *Rate of return: Information paper*, p. 25.

Figure 11: Distribution of outperformance / underperformance – 6 years to June 2021



Source: CEG analysis of NSP data. Includes all APA debt issues (the AER indicates that some APA debt instruments are excluded).

ENA agrees with the AER's assessment that:

> *it is not clear that this residual outperformance is material and persistent outperformance that needs to be adjusted for at this time.* [227]

ENA instead proposes that:

- The appropriate role for the EICSI in the 2022 RoRI process is that it confirms that the current benchmark approach using independent third-party data sources is performing well; and
- The AER would continue to develop and refine the index for consideration again in the 2026 RoRI process.

ENA notes the AER's preliminary position that:

> *Our preliminary position is to further analyse and consult on any adjustments required to our return on debt approach to remove the residual outperformance if the effect is material and persistent.*[228]

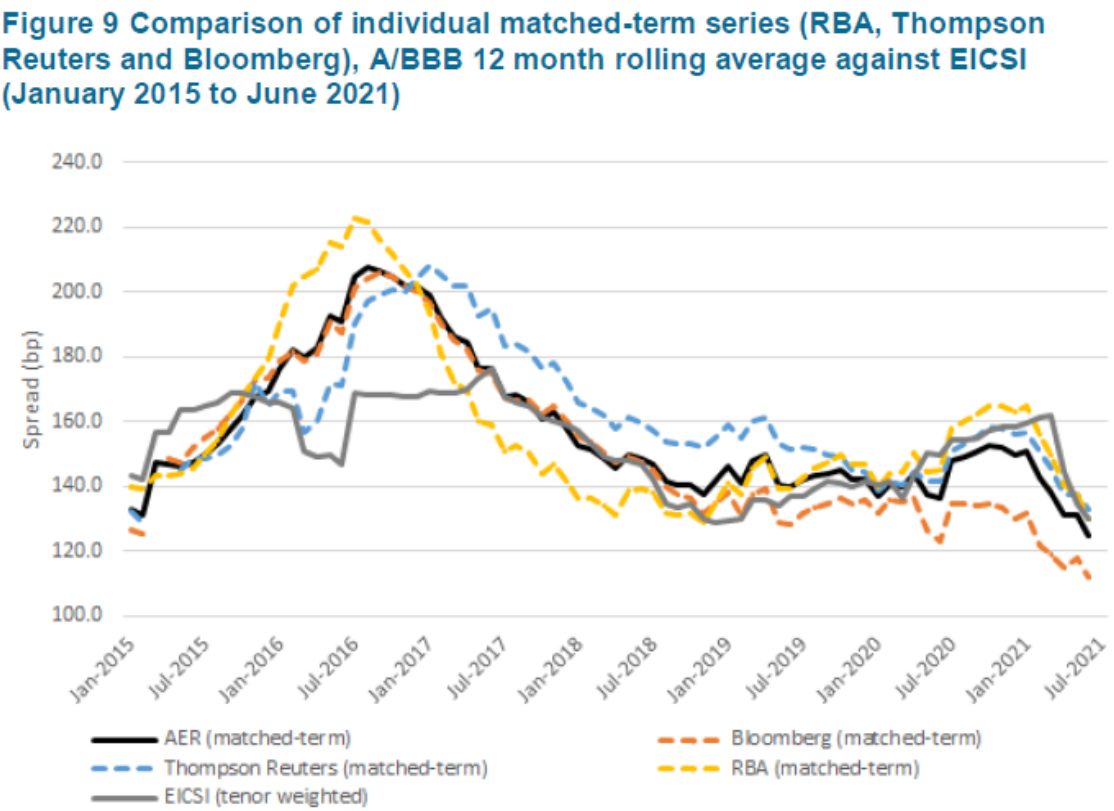
Since the residual outperformance is neither material nor persistent at this time, there is no basis for any adjustment in relation to it.

10.2 The nature of the outperformance and under-performance

The *Final Omnibus* paper sets out the AER's analysis of EICSI outperformance and under-performance relative to the regulatory allowance. The key information is presented in Figure 12 below.

[227] AER, December 2021, *Rate of return: Information paper*, p. 25.
[228] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 70.

Figure 12: AER analysis of outperformance and under-performance



Source: AER, December 2021, Overall rate of return, equity and debt omnibus: Final working paper, p. 80.

The key comparison in Figure 12 is between the solid black line, which represents the AER's regulatory allowance, and the solid grey line, which represents the AER's estimate of the actual cost incurred by networks. For most of the period analysed the grey and black lines are close together, with both within the range of estimates provided by the three third-party data sources. There are four instances where the grey and black curves diverge for a period:

- There is a period of apparent under-performance in the first half of 2015;
- There is a period of apparent outperformance in 2016;
- There is a period of apparent slight outperformance in 2019; and
- There has been a period of apparent under-performance since early 2020.

These periods of under-performance and outperformance average out to a differential of only 4 basis points.

The *Final Omnibus* paper draws particular attention to the period of apparent outperformance in 2016 and notes that this period is characterised by a temporary increase in credit spreads. This leads the AER to consider whether this analysis would support the imposition of some sort of cap on the regulatory allowance during periods of higher credit spreads. The answer to this question requires the consideration of two dimensions: empirical and theoretical.

The empirical data that is available consists of a single episode of higher spreads during 2016.

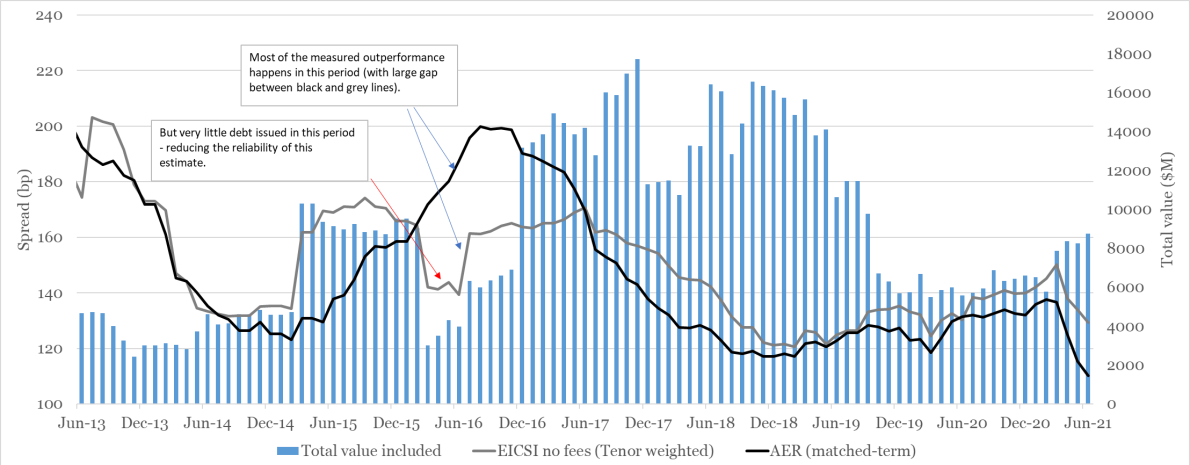
ENA's view is that it would be unsafe to draw any strong conclusions based on this single episode from 2016. Statistically, even if the AER series was not a 12 month rolling average, the observations of outperformance during 2016 would be not independent observations that corroborate one another because they would reflect the outcomes from similar market circumstances (i.e., from a short one year window). However, this is even more so when it is recognised that the AER series is a 12 month rolling window – such that the same debt issue is included in the reported value in its month of issue and in each of the subsequent 11 months. In this circumstance, the data from one month to the next approximately eleven 12^{ths} the same data.

ENA agrees with the AER that an adjustment would only be supported if the effect could be shown to be persistent, which would require more than a single episode.

That is, it would have to be shown that generally, across a range of market circumstances, outperformance is observed during periods of higher spreads – not that outperformance was observed during the one episode of higher spreads that we have observed (during 2016). In this regard, during the second half of 2020 spreads increased relative to their previous levels and this increase corresponded to a period of under-performance. ENA does not suggest that this episode is determinative, but it simply goes to the point that more data over a longer period would be required before one could have sufficient confidence to depart from the current independent third-party benchmark approach.

It is also the case that the number and value of observations in the 2016 period is lower than in later periods. This implies less, not more, weight should be given to estimates from that period. Indeed, it raises the prospect that the measure of outperformance in that brief window was a statistical artefact. However, because the AER method appears to give every 12 month rolling window the same weight, the AER method appears to materially overweight the importance of this period. That appears to be why the AER estimates overall positive outperformance while CEG estimates overall negative outperformance.

Figure 13: Relationship between measured outperformance and volume of bonds issued



Source: CEG analysis.

The AER also considers the theoretical support for a cap as follows:

> *we consider that there are theoretical grounds for why a cap may be appropriate...We **consider it reasonable** that the debt issued by the regulated networks in the primary market **may** have certain underlying characteristics that make it more favourable to debt holders in times of high average risk premiums when these are evident in the secondary market data. **It is also conceivable** that due to relatively low expected loss in case of default, the debt risk premiums for such regulated networks debt are bounded from above or constrained **in some way**.* [229]

The ENA notes that the AER's description is (appropriately) highly caveated. The AER appears to recognise that the evidence in favour of such a reform is, at best, speculative.

ENA considers it to be an important feature of a regulatory process that stakeholders have confidence that evidence is assessed in a reasonable and balanced way. The CEPA expert report commissioned by the AER presented extensive empirical evidence of a negative relationship between the risk-free rate and MRP compiled by them and others and provided a clear recommendation. The evidence presented in the CEPA and other papers indicated that there has been a strong negative relationship consistently for at least 20 years.

CEPA, ENA and QTC all provided summaries of independent academic work that provided a theoretical rationale for the negative relationship, and an explanation for why it has been observed over the previous 20 years. However, that body of evidence did not reach the standard required to have any role in the AER's process.

The empirical and theoretical support for some sort of cap being imposed in the return on debt allowance falls well short of the standard of evidence presented in relation to the relationship between the risk-free rate and MRP. Consequently, it does not reach the standard to have any role in the AER's process.

10.3 Type of adjustment considered

The *Information Paper* considers two types of potential adjustment to the independent third-party benchmark:

- An adjustment to reflect the average difference between the benchmark and the EICSI over some historical period (e.g., the average difference between the grey and black lines in Figure 12 above); or
- A cap of some sort applied to the allowed spread.

In relation to a potential adjustment to reflect the average differential, ENA notes that the current adjustment would be negligible in light of the uncertainty and variability in the various estimates. The following subsection sets out a number of reasons why it would be inappropriate to make any such adjustment as soon as the 2022 RoRI.

In relation to a potential cap of some sort, ENA notes that such an approach would introduce a clear bias into the regulatory allowance. If the grey and black lines in Figure 12 above are assumed to be perfectly precise and subject to no estimation uncertainty, the figure shows that there are some periods of outperformance (i.e., where debt is issued at rates below the regulatory allowance) and some periods of under-performance (i.e., where debt is issued at rates above the regulatory allowance). A cap would

[229] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 70, emphasis added.

have the effect of giving significant weight the episode of outperformance in 2016, while giving no weight at all to the periods of under-performance, including the period from 2020 to the present.

ENA considers that any evidence of outperformance and under-performance should be treated symmetrically. In particular, the periods of under-performance would only be disregarded if the AER formed the view that the under-performance was the result of inefficiency in the debt practices of network businesses. But during the period covered by Figure 12 there was a very strong incentive for every network to manage its debt portfolio as efficiently as possible – because the regulatory allowance was independent of its actual cost of debt.

Consequently, ENA's view is that a cap would embed a bias into the regulatory allowance.

The cap approach would only make sense if the AER was targeting net under-performance – an outcome where, on average, the regulatory allowance is lower than the actual costs incurred by networks.

10.4 Reasons for no adjustment at this time

ENA considers that there are several reasons for making no adjustment to the benchmark approach at this time:

- An adjustment to the independent benchmark should only be contemplated if there is evidence of a problem that is significant and sustained. The current differential is neither significant nor sustained.
- A cap would embed a bias into the regulatory allowance for the reasons set out above. This leaves only a potential adjustment to reflect the average outperformance, which is essentially negligible.
- The AER's estimate of outperformance has to be considered in light of the uncertainty and variability in the data that has produced it. In particular:
  - Figure 12 shows that there is no consistent or sustained outperformance. Rather there are some periods of outperformance and other periods of under-performance which, over the relevant data period, almost perfectly cancel each other out.
  - The variability in the three third-party estimates is many times greater than the 4 basis point estimate of average outperformance. The range between the highest and lowest of the three third-party estimates is frequently 20 basis points. And both the EICSI is very frequently within the range of the three third-party estimates. This does not suggest that the 4 basis point average is either significant nor sustained.
  - There is also significant uncertainty in relation to a number of features of the EICSI. For example, different estimates would be obtained depending on whether or not subordinated debt is included, how the term to maturity is measured in relation to callable debt, the treatment of data pertaining to APA Group, and so on. Again, within the context of this variability, 4 basis points seems very small.
  - CEG's analysis of the same data, with a slightly different method, shows underperformance on average.
- There are some clear benefits from setting the benchmark regulatory allowance on the basis of independent third-party data sources. A departure from such an independent benchmark should only be contemplated if there is clear evidence that the benchmark has become inappropriate.

10.5 How should the EICSI be used?

Under the current approach, the regulatory allowance is set with reference to independent third-party data sources. One of the primary benefits of the current approach is that this creates a strong incentive for networks to raise debt in the most efficient manner – because the network keeps the benefit of any outperformance that can be generated, and bears all of the cost of any under-performance that may occur. Thus, a properly constructed EICSI provides an indication of the cost of debt incurred by networks as efficiently as possible.

In this setting, there is a valuable role for the EICSI as a cross check on the independent benchmark regulatory allowance. In circumstances where the EICSI shows that there are some periods of outperformance and some periods of under-performance that net out to as little as 4 basis points, there is no basis for departing from the use of the independent third-party benchmark.

By contrast, if the regulatory allowance is somehow based on the EICSI itself, there are implications for the incentive to issue debt as efficiently as possible and the information value of the EICSI is diminished. For example, in the extreme case where the regulatory allowance is always set equal to the EICSI, there would be no incentive for the industry as a whole to issue debt in the most efficient manner.

Consequently, there would need to be strong evidence to depart from the use of the independent third-party benchmark. For the reasons set out above, ENA submits that the evidence presented in Figure 12 above falls well short of the required threshold.

10.6 Residual issues

ENA notes that the AER's preliminary position is that no adjustment should be made to the assumed credit rating to reflect anything other than evidence about the benchmark credit rating:

> *Our preliminary position is to not make any adjustments to the credit rating to reflect the EICSI.*[230]

ENA strongly endorses this position for the reasons set out in our earlier submissions.

Recommendation 21: Retain independent third-party data sources

The AER should continue to set the return on debt allowance on the basis of independent third-party data sources.

There is no case for any adjustment in relation to the EICSI.

Recommendation 22: Rule out asymmetric adjustments

The AER should rule out ever using the EICSI to place a cap on the return on debt allowance. Such an approach would introduce a bias and would only be appropriate if the AER was targeting average under-performance relative to its allowance.

[230] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 71.

11 Weighted trailing average return on debt

Key messages

- The weighted trailing average appears to be designed to help support the commercial viability of large new projects in the event that interest rates rise above the trailing average allowance.
- However, the proposed weighting scheme is insufficient, in and of itself, to address this commercial viability problem. Indeed, the proposed weighting schemes may actually *exacerbate* the problem.
- ENA's view is that there is a need for consultation on this issue between networks, consumers and the AER – with a focus on how the AER's rate of return allowance might support the commercial viability of major new projects. The consultation should include any proposed approaches to implementing the weighed trailing average return on debt and other rate of return options to help support the commercial viability of large new projects. If that consultation cannot be accommodated within the RoRI process, a separate process should be commenced as soon as possible, given the urgent need for some of these projects.

11.1 The approaches being considered by the AER

The Information Paper notes that some transmission networks may have lumpy capital expenditure that results in debt refinancing requirements beyond the standard 10% that is embedded into the current trailing average approach:

> *As a result, there could be large debt raising requirements in some years beyond the 10 per cent level built into our current trailing average return on debt. This in turn could create a mismatch between our return on debt and the capital requirements (and its cost) of the firms we regulate and may also affect incentives to invest in large capital-intensive projects.*[231]

This has led the AER to consider four possible approaches for weighting each tranche of its trailing average allowance:

> ***Option 1**: Maintain the current (simple trailing average) approach.*
>
> ***Option 2**: Weighted trailing average that applies to all distribution and transmission network service providers. Weights are based on the debt issuance assumptions in the Post Tax Revenue Model (PTRM).*
>
> ***Option 3**: Weighted trailing average only starts to apply when a large increase in the RAB (and therefore debt issuances) is forecast. We would need to set a threshold for the shift to a weighted trailing average. Once the weighted trailing average is triggered, weights are based on the debt issuance assumptions in the PTRM.*

[231] AER, December 2021, *Rate of return: Information paper*, p. 27.

> ***Option 4**: Weighted trailing average that applies to all TNSPs. Weights are based on the debt issuance assumptions in the PTRM.* [232]

The AER has also noted that any weighted trailing average would be based on PTRM forecasts rather than actual debt issuances.[233]

11.2 What problem is the AER seeking to address?

The Final Omnibus paper states that a key concern with the current uniform trailing average approach is that it may affect the commercial viability of major new projects:

> *The energy sector is currently undergoing transformation requiring large infrastructure to be built to connect more locationally and regionally dispersed variable renewable energy generation regions or zones. Following the AEMO's ISP, we are now seeing the potential for large projects and a corresponding large impact on the RAB and debt raising for electricity transmission businesses. This raises the prospect of material mismatches between the trailing average and the on the day rate.* [234]

The AER further stated that:

> *When our trailing average regulatory allowance is below the prevailing cost of debt, we could see pressure from the businesses to increase the regulatory allowance. In these circumstances a network may refuse to undertake the investment, or implicitly threaten to do so unless the regulatory allowance is increased.*[235]

Another way of stating this is that new projects cannot proceed unless they are commercially viable. It is not so much a case of networks 'refusing' or 'threatening,' but just the commercial reality that new projects can only proceed if they are commercially viable.

The change that the AER is considering appears to be designed to assist with this commercial viability issue. There are implications for the commercial viability of a project if the cost of debt required to finance it is lower than the regulatory allowance. This problem is more acute for very large projects that amount to a significant fraction of the firm's existing RAB.

Thus, the AER is exploring whether a weighted trailing average allowance for the return on debt may help with the commercial viability of major new projects – as it might provide a better match between the regulatory allowance and the actual cost of debt incurred when financing the new project.

11.3 The trailing average weights are one small part of a much bigger issue

The commercial viability of large new projects is affected by a number of things beyond the weights that might be applied to the various tranches when setting the return on debt allowance.

For example, the Project EnergyConnect case demonstrated that it is very difficult for a network to maintain the benchmark BBB+ credit rating when financing a major new project under the current

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[232] AER, December 2021, *Rate of return: Information paper*, pp. 27-28.
[233] AER, December 2021, *Rate of return: Information paper*, p. 28.
[234] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final Working Paper, p. 88.*
[235] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final Working Paper, p. 88.*

regulatory arrangements. There remain unresolved issues with a regime that sets regulatory allowances for a major new project on the basis of a capital structure that the project could not possibly support. That is, if an equity allowance is provided for 40% of the cost of a project that requires a materially higher proportion of equity finance, it is not clear how that project can be commercially viable without some form of government or other external subsidy.

Of course, it is true that a new project could support an investment grade credit rating if equity holders were willing to provide additional equity capital (i.e., beyond the 40% benchmark) while receiving the allowed return on debt on that additional equity. But such an arrangement will fail the commercial viability requirement.

Moreover, many of the major construction projects that are required over the next decade are large relative to the existing network infrastructure of the networks that will be delivering them. These large new projects are also complex, involving project design, land acquisition, construction contracting, environmental, biodiversity and indigenous heritage approvals – well beyond the complexity and scale of existing business as usual CAPEX.

Thus, these major new projects are very large and complex relative to the business-as-usual operations of a network. They are company-changing projects. In these circumstances, it is prudent for investors and network boards to consider them very carefully and to proceed only if commercially viable.

This threshold commercial viability issue is not something that can be easily solved by altering the weighting scheme of the return on debt allowance. The return on debt allowance is one small piece of a range of considerations that are relevant to the commercial viability of major new projects.

11.4 The contemplated changes may in fact exacerbate the problem

The AER has not specified any particular proposal for the change in the weighting scheme – only that the weights on each tranche of debt might vary according the capital expenditure profile of a particular network. Depending on how this differential weighting scheme was implemented, it is possible that the change could *exacerbate* the commercial viability problem.

For example, during the Concurrent Evidence Sessions, Dr Lally proposed that a major new project might be assumed to be separately financed with ten different tranches of debt – 10% one-year debt, 10% two-year debt and so on. However, even though this results in the return on debt allowance being based on prevailing rates (rather than the historical average), it is entirely possible that the change in the term of debt (to an average of 5.5 years) could result in a *lower* allowance than under the current approach.

Of course, risks of commercial viability problems would not be solved by *reducing* the regulatory allowance for major new projects.

11.5 ENA's proposed way forward

ENA's view is that an adjustment to the weights applied to the various tranches of debt under the trailing average approach is potentially one of a package of measures that should be considered in relation to the commercial viability of major new projects. Simply changing the weights on the trailing average tranches does not represent a 'silver bullet' solution to the (much more complex) commercial viability issue. It may also have a relatively minor effect on outcomes in many circumstances where commercial viability is a real issue.

Other measures to be considered include the entire allowed return on capital for major new projects (including their ability to support debt finance), the exercise of the AER's discretion under individual determinations and other regulatory processes, and potential rule changes.

Moving to some form of weighted trailing average would not, in and of itself, be a fit for purpose response to the commercial viability problem in relation to major new projects. This is best addressed in a holistic fashion.

In this regard, ENA note that the AEMC is currently conducting a Review of Transmission Investment Frameworks. However, the danger of leaving the commercial viability issue to be addressed in that review is that rate of return issues fall within the AER's jurisdiction and may not be fully addressed within the AEMC's process.

Consequently, ENA's view is that there is a need for consultation on this issue between networks, consumers and the AER – with a focus on how the AER's rate of return allowance might support the commercial viability of major new projects. If that consultation cannot be accommodated within the RoRI process, a separate process should be commenced as soon as possible, given the urgent need for some of these projects.

Recommendation 23: A full consultation on the commercial viability of major new projects is required

There is an urgent need for consultation on how the AER's rate of return allowance might support the commercial viability of major new projects. If that consultation cannot be accommodated within the RoRI process, a separate process should be commenced as soon as possible.

12 Cross checks

Key messages

RAB multiples

- Aggregated RAB multiples reflect not just the present value of expected regulatory allowances, but also the present value of incentive payments, revenue from unregulated assets and future projects, expected increases in future AER allowances, and other things.
- It is entirely possible that the present value of expected regulatory allowances is less than the RAB, even though the aggregated RAB multiple is above 1 – due to these other sources of value. Consequently, RAB multiples have zero informative value unless the present value of expected regulatory allowances can be fully and transparently separated from other sources of value.

Recent transaction evidence / independent expert estimates of required returns

- Independent expert estimates of the market cost of equity capital have recently been prepared for two electricity network businesses that are regulated by the AER. Both report that the current market cost of equity capital is materially higher than the AER's current regulatory allowance. ENA considers this to be highly relevant and informative evidence.

Comparable regulatory determinations

- ENA considers that the AER's estimation process might be informed by information about:
  - The types of data that other regulators consider;
  - The statistical and other methods that other regulators use to estimate parameters; and
  - The way in which other regulators exercise their regulatory judgment.
- This information would be highly relevant in assisting the AER to understand what is driving its allowed return on equity to be lower than that of comparable regulators, and determining whether any revision of the AER's approach might be warranted.

Financeability analysis

- ENA proposes that a financeability analysis would be applied to the benchmark firm via the PTRM, with the goal of testing whether the allowed return supports the credit rating that was assumed in deriving it.
- This internal consistency would appear to be required to support the NPV=0 principle.

Scenario analysis

- Scenario analysis is designed to ensure that the RoRI is robust to, and provides sensible allowances, across the range of financial market conditions that might be reasonably contemplated over the effective life of the instrument.
- Ensuring that the RoRI is robust to a range of future market scenarios is more important for the AER than for other regulators, due to the nature of the binding instrument legislation.

12.1 RAB multiples and recent transaction evidence

With the Spark and AusNet transactions, there is one remaining opportunity (APA Group) to observe a transaction multiple, and trading multiples will only be available for that single firm while it remains

listed. Consequently, the question of what use might be made of RAB multiples has become somewhat theoretical.

AER's preliminary position

The *Final Omnibus* paper indicates that the AER does not propose to use RAB multiples in any deterministic way, but rather as a potential trigger for further investigation:

> *Our preliminary position is that RAB multiples may be useful as a trigger for further investigation into the regulatory framework. This follows from our 2018 position. However, it is unlikely to be able to provide conclusive information on the rate of return unless properly adjusted for the influence of other possible factors.* [236]

The AER explains that the reason for this approach, as adopted in the 2018 RoRI, is that the RAB multiple reflects many things other than the adequacy of the allowed return:

> *This was because of the difficulty in disaggregating the information contained in RAB multiples meant it could not be used to reliably determine the degree of correspondence with the allowed rate of return.* [237]

However, the AER concludes that:

> *We cautiously note that the information would suggest our current and expected rates of return are at least sufficient (as part of the overall regulatory compensation to investors) and potentially higher than that needed to attract investment.* [238]

What does a RAB multiple reflect?

The AER has correctly noted that RAB multiples reflect many things other than the adequacy of the allowed return on the existing RAB assets. Indeed, the observed enterprise value reflects many things beyond the present value of the allowed return on the existing RAB. It also reflects expected revenues from unregulated assets, efficiency improvements and incentive payments, a control premium, the possibility that a buyer may have overpaid, expectations about future regulatory changes, and any differences in debt costs arising from the AER's use of a trailing average cost of debt.

Thus, the current enterprise value, and therefore the RAB multiple, will reflect many things including:

1. The present value of allowed revenues on the current RAB assuming that the current allowance remains fixed in perpetuity;
2. Any additional present value arising from anticipated future increases in regulatory allowances (e.g., towards those allowed by comparable regulators);
3. The present value of anticipated incentive payments generated on current and future RAB assets;
4. The present value of revenue generated from unregulated assets;

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[236] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 130.
[237] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 129.
[238] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 131.

5. The net present value of any forecasted or *planned* future investments, plus the 'real option' value of *potential* future investments; and
6. The net present value of any difference between the trailing average regulatory allowance for the return on debt and the spot borrowing rate to be paid by a potential purchaser.

From the above list, it is only item (1) that is relevant to an assessment of the adequacy of the current regulatory allowance. Thus, before any conclusion at all can be drawn from RAB multiples, items (2) – (6) (and anything else that is embedded into the enterprise value) must be subtracted.

The need for a clear statement about regulatory sufficiency

Consider the scenario in which the RAB multiple for item (1) above is less than one (say 0.9), but where there is material value in items (2) to (6) so that the overall RAB multiple is 1.4. That is, the regulatory allowance on the current RAB falls materially short of the required return of investors, so that the present value of the regulatory allowances is less than the current RAB and NPV<0. However, the total present value of items (2) to (6) equals 50% of the RAB so that the overall RAB multiple is 1.4. In summary, although the buyer would only be prepared to pay an amount less than the RAB for the stream of allowed returns, it would be prepared to pay more than the RAB for the whole package of benefits set out above.

There are two possible ways to interpret this evidence:

- One view is that this is evidence of the inadequacy of the current level of allowed returns. Because the present value of regulatory allowances is less than the current RAB, the NPV=0 criterion is violated. This implies that the regulatory allowance should be increased.
- The alternative view is that the current regulatory allowance is sufficient to attract investment into the Australian network sector, so there is no problem with the current level of regulatory allowance.

There are, of course, two quite fundamental problems with the second interpretation:

- First, this interpretation is entirely inconsistent with the NPV=0 principle that underpins the AER's regulatory framework. It is also inconsistent with the AER's statements about how the NEO and NGO are best promoted by setting the allowed return to the best possible estimate of the market cost of capital at the time of each decision.
- Second, under this interpretation it would be entirely rational for the purchaser to pay a RAB multiple of 1.4 when purchasing the business, but then to face a strong disincentive against investing in regulated assets for as long as the current regulatory allowance remains in place. This would manifest as transactions occurring at such multiples while, at the same time, discretionary network investment into regulated assets falls (or requires some form of government or other subsidy in addition to the regulatory allowance). Such a scenario has obvious implications for the very significant network investment that is required as the economy de-carbonises.

The AER's position on potential adjustments for expected incentive payments is consistent with the view that the allowed return (alone) should match the market cost of capital – rather than requiring regulated businesses to receive some level of incentive payments to achieve the required return. In this regard, the AER has stated:

> *We do not intend to adjust the rate of return for expected incentive scheme outperformance. We aim to set an efficient rate of return that is neither too high nor too low as part of our regulatory objectives which means that consumers pay no more than is*

necessary…Incentive schemes are designed to incentivise efficient behaviour from regulated businesses. We agree with networks' view that the rate of return should be set independent of incentive schemes.[239]

That is, the allowed return must be sufficient to cover the market cost of capital before any incentive payments that might be made. The same would apply to the other sources of value in the above list.

Thus, in the scenario set out above, the regulatory allowance would be inadequate even though the aggregated RAB multiple was 1.4.

Next, consider the same scenario as above, but where it is impossible to disaggregate the RAB multiple into items (1) to (6) in the above list. That is, we observe that a transaction occurs at a RAB multiple of 1.4 and we have no reliable information about how much of that is attributable to the various items (1) to (6) above.

In this case, the RAB multiple tells us absolutely nothing about the adequacy of the current level of allowed returns and has no informative value whatsoever.

ENA submits that the first interpretation above should be adopted – RAB multiples indicate that the current regulatory allowance is sufficient to attract the required capital investment only if the multiple for item (1) is one or above. If there is no accurate basis for disaggregating the total RAB multiple, it is impossible to know whether the RAB multiple for item (1) is above or below one. In this case, the RAB multiple has no informative value at all – not even as an 'informal sense-check.'

These issues are discussed further in the separately lodged expert report from the independent valuation advisory firm Grant Thornton.

Recommendation 24: No regard to RAB multiples

The 2022 RoRI should have no regard to any RAB multiple unless it can be accurately disaggregated by removing all components of enterprise value other than the present value of current regulatory allowances on the existing RAB.

Evidence from recent independent expert reports

Some useful evidence about what goes into RAB multiples can be drawn from the recent independent expert reports commissioned as part of the sale processes for Spark Infrastructure and AusNet Services.

In both cases, the independent expert has performed a discounted cash flow valuation exercise. This involves forecasting expected cash flows (all of the items in the above list), estimating the required return on capital, and computing the present value of those cash flows. The present value of those cash flows represents the independent expert's estimate of the fair value of the business. These independent expert reports are a key feature of the sale process and play an important and influential role in the decision-making of the parties to the transaction. Whereas the buyer and seller may apply somewhat different valuation assumptions, the independent expert valuation report provides very useful and relevant evidence about what goes into the assessment of enterprise value.

[239] AER, December 2020, *International regulatory approaches to rate of return: Final working paper*, pp. 34-35.

The independent expert's estimate of the current enterprise value can be divided by the current RAB and expressed as an overall RAB multiple.

The RAB multiple has value only to the extent that it provides information about the adequacy of the current regulatory allowance for the return on capital. As noted above, the aggregated RAB multiple provides no useful information unless it can be disaggregated into its component parts. The recent independent expert reports do not provide sufficient information to perform such a disaggregation. However, they do provide a direct estimate of the current required return on capital – the market cost of capital – that is directly relevant to the AER's task.

For example, the KPMG independent expert report prepared for the Spark Infrastructure transaction provides estimates of the current market cost of equity capital as set out in Table 5 below. The table shows that the KPMG estimates of the market cost of capital are materially higher than the AER's regulatory allowance.

Table 7: KPMG estimates of the market cost of equity capital

	AER current	KPMG low	KPMG high
Risk-free rate	1.73%	2.80%	2.80%
MRP	6.1%	6.0%	6.0%
Equity beta	0.60	0.73	0.83
Return on equity	**5.39%**	**7.17%**	**7.76%**

Source: Source: KPMG independent expert report, Table 39, p. 105. Equity beta re-levered to 60% using AER re-levering approach. AER current risk-free rate is the yield on 10-year government bonds taken as at date of KPMG report. Note that KPMG adopts an above market risk-free rate in lieu of a prevailing MRP estimate.

This implies that KPMG has computed a RAB multiple in relation to item (1) above that is less than one. By definition, if regulatory allowances are generated using one rate of return and then discounted back to present value using a significantly higher rate of return, the present value must be less than the RAB.

But it is unnecessary to consider the implications for RAB multiples because we already have a direct comparison of allowed and required returns.

Similarly, the Grant Samuel independent expert report prepared for the AusNet Services transaction provides estimates of the market cost of capital as at December 2021. Grant Samuel adopt a two-step approach. The first step is to implement a mechanistic version of the CAPM. We show below that this produces post-tax WACC estimates in the range of 4.2% to 4.5%. The second step is to recognise that the mechanistic CAPM produces implausibly low estimates of the cost of equity capital in the prevailing market conditions such that an adjustment is required. In this regard, Grant Samuel states that:

> *Strict application of the CAPM at the present time (using current parameters) gives results that are arguably unrealistically low and understate the true cost of capital (primarily because of extremely low government bond rates). While the broad expectation is that*

government bond rates across the globe will remain extremely low for several years as the world economy seeks to recover from the impacts of the COVID-19 pandemic. The discount rates produced by CAPM do not seem to accord with how investors set their expected returns and are often inconsistent with other measures such as the Gordon Growth Model (which is based on observable dividend yield plus a long term growth rate).

Some academics and valuation practitioners consider it to be inappropriate to add a "normal" market risk premium (e.g. 6%) to a temporarily depressed bond yield and therefore advocate that a "normalised" risk free rate should be used. This practice has become increasingly common among broker analysts with an assumed risk free rate of around 2.5% not uncommon. Assuming a risk free rate of 2.5% would result in a CAPM WACC of 4.8-5.1%. Alternatively, there is some evidence that risk premiums are higher when risk free rates are lower (i.e. implying a more stable overall cost of equity).[240]

This leads Grant Samuel to conclude that:

Having regard to these matters, Grant Samuel has adopted a discount rate (WACC) in a range around 5.0% for AusNet's electricity and gas business operations.[241]

and that:

it is equivalent to a cost of equity of 7.0%).[242]

As Grant Samuel are unclear about the extent to which its final adopted WACC is the result of an increase to the risk-free rate or to the MRP, both are considered in Table 8 below. In that table, the first two columns represent Grant Samuel's mechanistic implementation of the CAPM. The third column shows that increasing the CAPM risk-free rate to 3.1% would produce a return on equity of 7% and a WACC of 5%, as adopted by Grant Samuel. The final column shows that increasing the CAPM MRP to 8% would reconcile with the final cost of capital figures adopted.

Table 8: Grant Samuel WACC estimates

	GS low	GS high	Risk-free rate adjustment	MRP adjustment
Risk-free rate	1.8%	1.8%	3.1%	1.8%
MRP	6.0%	6.0%	6.0%	8.0%
Equity beta	0.6	0.7	0.65	0.65
Return on equity	5.4%	6.0%	7.0%	7.0%

[240] Grant Samuel, December 2021, *Independent expert report for AusNet Services*, Appendix 3, pp. 14-15.
[241] Grant Samuel, December 2021, *Independent expert report for AusNet Services*, Appendix 3, pp. 14-15.
[242] Grant Samuel, December 2021, *Independent expert report for AusNet Services*, Appendix 3, pp. 14-15.

Return on debt	4.3%	4.3%	4.3%	4.3%
Gearing	50%	50%	50%	50%
Tax	30%	30%	30%	30%
Post-tax WACC	**4.2%**	**4.5%**	**5.0%**	**5.0%**

Source: Grant Samuel, December 2021, Independent expert report for AusNet Services, Appendix 3, pp. 9-15.

To obtain a return on equity allowance that is comparable with the AER's regulatory allowance, it is necessary to re-lever the equity betas to reflect 60% gearing. The AER's standard re-levering approach is applied in Table 9 below. Consistent with the KPMG report, the Grant Samuel report implies that the market cost of equity capital is very materially higher than the AER's allowance.

Table 9: Grant Samuel estimates of the market cost of equity capital

	AER current	GS risk-free rate adjusted	GS MRP adjusted
Risk-free rate	1.8%	3.1%	1.8%
MRP	6.1%	6.0%	8.0%
Equity beta	0.60	0.81	0.81
Return on equity	**5.5%**	**8.0%**	**8.3%**

Source: Grant Samuel, December 2021, Independent expert report for AusNet Services, Appendix 3, pp. 9-15. Equity beta re-levered to 60% using AER re-levering approach.

ENA submits that:

- These independent expert reports provide direct evidence of the material inadequacy of the current level of the allowed return on equity; and
- RAB transaction multiples provide no relevant evidence as to the adequacy of the current level of allowed returns because there is no basis for performing the required disaggregation.

These issues are discussed further in the separately lodged expert report from the independent valuation advisory firm Grant Thornton, the findings of which are summarised below.

Recommendation 25: Recent independent expert estimates are highly relevant evidence

The 2022 RoRI should have regard to recent independent expert estimates of the required return on equity. This is clearly relevant evidence about the market cost of equity capital.

Findings and evidence from Grant Thornton report: RAB multiples and direct cost of equity estimates from Independent Expert Reports

ENA has commissioned the independent valuation advisory firm Grant Thornton to consider:

- The comparability of tasks between the role of an independent expert preparing an independent expert report and the AER in determining a weighted average cost of capital
- The analytical framework used by investors and experts in determining the WACC and how that compares to the framework adopted by the AER; and
- The extent to which RAB multiples can be used in assessing the adequacy of allowed regulatory returns, considering all factors in addition to the discount rate which may impact the overall multiple.

A copy of this public report has been attached with the submission.

Grant Thornton observes in respect of the comparability of the tasks undertaken by independent experts that:

> *In both circumstances the Expert and the AER are effectively and equivalently forming a view as to the rate of return required by a hypothetical prudent purchaser". Whilst we acknowledge the regulatory weighted average cost of capital and Expert's discount rate are applied for different purposes, both parties are in effect attempting to calculate the minimum rate of return required to compensate for the risk involved in investing in a company.* ***That is, both are seeking to estimate the market cost of capital****.*[243] *(emphasis added)*

And that:

> *In both cases, the parties are in effect attempting to calculate* ***an unbiased view of the return an investor would require for investing in that asset****.*[244] *(emphasis added)*

Following an evaluation of the possible reasons the two tasks could be perceived to differ Grant Thornton indicates its view that they are comparable for a number of reasons detailed in the report, and conclude:

> *In summary, an estimate of the minimum expected return that investors would require to invest capital in a regulated network business is relevant to the task of both the AER and Experts.*[245]

The Grant Thornton report steps through in detail the approaches and the analytical frameworks used by investors and Independent Experts in determining weighted average cost of capital assumptions, finding that:

- **Investors typically apply a discount rate into perpetuity and hence make adjustments when selecting the risk-free rate to remove the impact of short-term trends.** This has been highlighted in recent independent expert reports where experts have adjusted the observed 10-year Australian Government bond rate as the current environment is not reflective of returns into perpetuity

[243] Grant Thornton, Report to ENA: RAB Multiple Project, 11 March 2022, p.8
[244] Grant Thornton, Report to ENA: RAB Multiple Project, 11 March 2022, p.3
[245] Grant Thornton, Report to ENA: RAB Multiple Project, 11 March 2022, p.9

- **Investors and experts in selecting the market risk premium consider the inverse relationship between the market risk premium and the risk-free rate, and the overall equity market returns over an extended period**. The AER in contrast considers these inputs in isolation which can result in the assumed cost of equity deviating materially from the expected long-term equity returns observed in independent expert reports
- **As might be expected, investors estimate the cost of debt based on observed trends in margins over long-term Australian Government bonds**, whereas the AER use its 10-year trailing average approach to replicate the staggered maturity method used to fund regulated utilities.[246]

Grant Thornton indicate that these items have caused the cost of capital calculated by independent experts to '*materially deviate'* from those set by the AER. For example, the report highlights that the 2021-22 regulatory cost of equity estimates under the AER's existing 2018 Instrument are significantly below (by up to 200 basis points) recent independent expert report cost of equity assumptions.[247] Grant Thornton note:

> *The consistent observed shortfall between the AER regulatory return and those that Experts have derived as being the required return of investors, suggests that by ignoring the longer-term timeframe that investors require, the regulatory returns as currently determined by the AER are insufficient to attract investment in regulated utilities.*[248]

And:

> *Independent Expert Reports ("IERs") supporting the above transactions prepared by KPMG (Spark) and Grant Samuel (AusNet) have identified that* ***the cost of capital for a market participant investing in regulated utilities is higher than the current regulatory returns, implying that returns have instead been insufficient on a stand-alone basis to promote investment.***[249] *(emphasis added)*

Assessing the AER's past statements which suggest that recent RAB multiples indicate that current available returns are sufficient to attract efficient levels of network investment, Grant Thornton provides an analysis of the range of factors that are inputs into these multiples. Following this assessment Grant Thornton indicate that:

> *Whilst we have attempted to isolate and quantify the impact of the above factors on recent RAB multiples paid by investors and implied by Experts, there is insufficient publicly available information to do so with any degree of accuracy.* ***Consequently we do not see how RAB multiples can be used to assess the adequacy of the allowed regulatory return****.*[250] *(emphasis added)*

This leads the report to conclude that:

> *In order for the RAB multiples observed in IERs or transactions to provide a meaningful basis against which to assess the reasonableness of current regulated returns, the observed RAB*

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[246] Grant Thornton, Report to ENA: RAB Multiple Project, 11 March 2022, p.3-4
[247] Grant Thornton, Report to ENA: RAB Multiple Project, 11 March 2022, p.4
[248] Grant Thornton, Report to ENA: RAB Multiple Project, 11 March 2022, p.19
[249] Grant Thornton, Report to ENA: RAB Multiple Project, 11 March 2022, p.3
[250] Grant Thornton, Report to ENA: RAB Multiple Project, 11 March 2022, p.5

multiple would need to be decomposed into its constituent parts, with all elements other than the regulatory allowance on the current RAB being removed.

***In practice this is a challenging task for the AER, particularly where information is limited to publicly available data only**. Due to confidentiality, forecast data upon which transactions and IERs are based are not made available to the public as they may contain commercially sensitive information. **Further, a number of the factors influencing value are based on qualitative assessments which are not observable or measurable in terms of their impact on the RAB multiple**. As such, it is **unlikely that the RAB multiple could be reliably broken down sufficiently to provide a reasonable benchmark for determining the adequacy of regulated returns. However, the IERs produced in relation to transactions provide direct estimates of the market cost of equity capital, against which the AER's regulatory allowance can be compared.**[251] (emphasis added)*

12.2 Information in comparable regulatory determinations

The relevance of comparable regulatory determinations

The *Final Omnibus* paper identifies the primary reason for having regard to the approaches and allowances of comparable regulators as follows:

> *Other regulators have similar task as us which is to set the rate of return for regulated businesses. Their estimates may be comparable to our rate of return because they are for businesses with similar risks.*[252]

The relevance of other regulatory determinations led the AER to commission the Brattle report:

> *We are not the only regulator making this type of assessment. Regulators in many overseas jurisdictions also grapple with some of the same issues. A high-level comparison of regulatory approaches allows us to consider these international approaches, and learn from what has worked (or has not worked) overseas.*[253]

The manner in which evidence from comparable regulators might be used

ENA considers that comparable regulatory allowances provide a key return on equity cross-check.

In the case where the AER's allowance differed materially from the allowances of comparable regulators performing the same task, the AER should reconsider how it has exercised its judgment throughout the estimation process. This may lead the AER to amend its approach, but it may not. In the case where the AER determines that its allowance does best reflect the prevailing market cost of equity capital for the benchmark firm, it would explain why that remains its view, even though comparable regulators had reached a different view.

In particular, ENA considers that the AER's estimation process might be informed by information about:

- The types of data that other regulators consider;
- The statistical and other methods that other regulators use to estimate parameters; and

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[251] Grant Thornton, Report to ENA: RAB Multiple Project, 11 March 2022, p.30
[252] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 137.
[253] AER, December 2020, *International regulatory approaches to rate of return: Final working paper*, p. 2.

» The way in which other regulators exercise their regulatory judgment.

During the Concurrent Evidence sessions, Dr Hancock suggested that evidence from comparable regulators would only be relevant to the extent that those regulators applied the same methods to the same type of data as is used in the AER's processes – or where adjustments could be made to equate the approach of another regulator with the AER's approach. ENA has the opposite view. The great benefit of consideration of the approaches of other regulators is to identify differences between the AER's approach and the approaches of other regulators. Such an analysis is invaluable in providing information about what might be driving any differences between the AER's regulatory allowance and those of comparable regulators of comparable energy networks.

The Brattle report

The AER commissioned Brattle (June 2020) to benchmark the AER's regulatory allowances to those of other comparable regulators. Brattle identified that other regulators use different approaches to the 2018 AER when estimating the beta and MRP parameters for use in the CAPM and demonstrated that the AER's 2018 approach produced lower return on equity allowances than other regulators. Brattle concluded that the 2018 AER's approach was not as effective as that of other regulators and identified some areas for consideration.

This is precisely how ENA sees such return on equity cross-checks being used. The cross-check does not mechanically feed back into a revision of the allowed return or of any particular parameter. Rather, it highlights a divergence between the AER's approach and that of other comparable regulators – for the AER to consider.

Brattle reported to the AER that:

» The AER's allowed nominal return on equity is lower than that adopted by every other regulator for which a comparison could be made;[254]

» The AER's allowed real return on equity is lower than that adopted by every other regulator for which a comparison could be made. The closest allowed real return on equity is almost double the AER's allowance;[255]

» The AER's allowed nominal equity risk premium is lower than that adopted by every other regulator for which a comparison could be made. (This does not account for other regulators that set the allowed risk-free rate above the prevailing government bond yield.);[256] and

» The AER's allowed real equity risk premium is lower than that adopted by every other regulator for which a comparison could be made. (This also does not account for other regulators that set the allowed risk-free rate above the prevailing government bond yield.)[257]

The *Final Omnibus* paper sets out a summary of the Brattle results and concludes as follows:

> *On face value, our return on equity is at the lower end of rates of return allowed by regulators internationally. In an environment of international competition for capital this*

[254] Brattle, June 2020, *A Review of international approaches to regulated rates of return*, Table 4, Row 3, p. 49.
[255] Brattle, June 2020, *A Review of international approaches to regulated rates of return*, Table 4, Row 9, p. 49. 2.42% vs. 4.19%.
[256] Brattle, June 2020, *A Review of international approaches to regulated rates of return*, Table 5, Row 4, p. 50.
[257] Brattle, June 2020, *A Review of international approaches to regulated rates of return*, Table 5, Row 9, p. 50.

observation leads us to consider whether our return is sufficient to attract necessary investment. However, this seems difficult to reconcile with the recent takeover offers for Spark and AusNet.[258]

ENA considers that there are two fundamental problems with this conclusion:

- Whereas the AER concludes that its allowed return on equity is "at the lower end" of the allowances of comparable regulators, it is in fact below the allowed return of every other regulator. This is an important distinction when using this evidence to cross check the AER's allowance. Evidence that identifies the AER's allowance as lower than that of every comparable regulator that was examined calls for a more serious re-examination of the AER's processes than evidence that shows the AER's allowance to be within the range of that offered by comparable regulators. ENA considers that such evidence should not be easily dismissed and should reasonably lead the AER to fully examine why its allowance is lower than all others and to consider the obvious implications of that. This is particularly the case where the AER's expert consultant advises that the AER's approach is not as effective of that of other regulators and recommends a number of changes for the AER to consider; and
- The suggestion that the Brattle evidence is somehow invalidated by the takeover offers for Spark and AusNet has no basis and is particularly concerning. As discussed in the previous section, RAB transaction multiples provide no relevant evidence as to the adequacy of the current level of allowed returns because there is no basis for performing the required disaggregation. The aggregated multiple would only be relevant under the second interpretation in section 12.1 above – where the AER considers that an aggregated RAB multiple greater than one implies the sufficiency of its allowed return even in circumstances where the present value of allowed revenues is lower than the RAB.

Proposed reasons for disregarding the evidence from comparable regulators

The *Final Omnibus* paper identifies the following two leading reasons why the AER might have little regard to the allowances of comparable regulators:

- Other regulators may adopt different methodologies and exercise their judgment in a different way when estimating the return on equity. For example, some regulators use different approaches and different types of data when estimating beta and the MRP, and other regulators apply their judgment in different ways when distilling a range of estimates into a single parameter value; [259] and
- Whereas the AER's decisions need to contribute to the achievement of the NEO and NGO, other regulators may have a different objective, which may affect their return on equity estimates.[260]

In relation to the 'different approaches' issue, ENA notes that the possible identification of different approaches for estimating the required return on equity, including the different application of regulatory judgment, is one of the primary reasons for considering the approaches of other regulators. The extent to which other regulators use different types of data or different methods and approaches, and the extent to which other regulators apply their judgment in different ways, is relevant information that would assist in explaining, for example, why it is that the AER's return on equity allowances are lower than those of all comparable regulators.

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[258] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 139.
[259] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 137.
[260] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 137.

For example, other regulators tend to use a range of approaches when estimating beta and MRP and have some regard to all of them. By contrast, the AER's approach in 2018 was to have primary regard to a single type of estimate (domestic regression results for beta and the HER approach for MRP). No other evidence then had any effect on the adopted estimates.

Logically, there would be no point in restricting consideration to only those entities that examine the same data with the same methodologies and exercise regulatory judgment in the same way because that would produce the same outcomes. Knowing that the AER is the only regulator that uses its specific approach and the only regulator that sets such low return on equity allowances is the whole point of performing this sort of cross-check.

The suggestion that other regulators may have a different objective also has little to support it. The AER has stated that the NEO and NGO are best supported by using the best estimate of the market cost of capital – the return that investors require to commit capital to the regulated firm. This would seem to be a common objective among regulators – that they would seek the best possible estimate of the market cost of capital and consequently the required return on equity at the time of their decision.

For example, in its recent WACC review, the QCA concluded that:

> *The rate of return is the return expected by investors to compensate them for investing in a firm. Therefore, in relatively efficient markets, it is the cost to the firm of obtaining debt and equity funding from investors.* [261]

The legislation under which the QCA operates bears many similarities to the NEO/NGO and RPP that apply to the AER. For example, the QCA notes that:

> *The object of part 5 of the QCA Act as set out in s. 69E, namely to promote the economically efficient operation, use of and investment in, significant infrastructure by which services are provided, with the effect of promoting effective competition in upstream and downstream markets.* [262]

Similarly, Brattle has advised the AER that:

> *Ofgem's overall objective is protecting consumer interests and promoting competition. Efficiency is mentioned as a subsidiary goal.*[263]

In implementing its objectives, Ofgem has noted the need to set the allowed return to match that required by investors:

> *Accurate remuneration for equity investors will secure network investment during RIIO-2 and help keep consumer charges in line with efficient costs.*[264]

ENA recommendations

ENA considers that comparable regulatory allowances provide a key return on equity cross-check.

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[261] QCA, November 2021, *Rate of return review: Final report*, p. 1.
[262] QCA, November 2021, *Rate of return review: Final report*, p. 2.
[263] Brattle, June 2020, *A Review of international approaches to regulated rates of return*, p. 28.
[264] https://www.ofgem.gov.uk/sites/default/files/docs/2021/02/final_determinations_-_finance_annex_revised_002.pdf, p. 24.

In particular, ENA considers that the AER's estimation process might be informed by information about:

- The types of data that other regulators consider;
- The statistical and other methods that other regulators use to estimate parameters; and
- The way in which other regulators exercise their regulatory judgment.

This information would be highly relevant in assisting the AER to understand what is driving its allowed return on equity to be lower than that of comparable regulators, and determining whether any revision of the AER's approach might be warranted.

Given the regard that Australian regulators have to each other's decisions, and the fact that it is only the AER and ERA that regulate energy networks, it is important to have regard to the practice of comparable international regulators as part of this exercise.

Recommendation 26: Have regard to what comparable regulators do

The 2022 RoRI should have regard to the data, methods, and regulatory judgment exercised by comparable regulators engaged in a comparable task.

12.3 Financeability tests

The *Final Omnibus* paper acknowledges that:

> *We acknowledge that financeability tests can help assess whether a hypothetical entity with a capex program, gearing and level of risk, reflected in our rate of return allowance, can raise debt at the credit rating consistent with the benchmark credit rating.* [265]

ENA considers that this is the key role of financeability tests – to determine whether the regulatory allowance supports the credit rating that is assumed when deriving that allowance. It is difficult to see how a regulatory allowance that is internally inconsistent could represent the best unbiased estimate of the cost of capital, or how it could support the NPV=0 principle.

If financeability tests are conducted on a notional benchmark firm and confirm that the allowed returns are likely to support the assumed credit rating, they have served their purpose. Their role is to identify those special cases in certain market conditions where internal inconsistency problems arise.

ENA remains of the view that any financeability test should be applied to the benchmark firm. The relevant financial metrics (e.g., FFO/Net Debt ratio, interest coverage, gearing as defined by ratings agencies) would be routinely computed in a slightly augmented version of the PTRM.

ENA considers it important to note that the financeability test would be applied to the benchmark firm via the PTRM, with the goal of testing whether the allowed return supports the credit rating that was assumed in deriving it. The *Final Omnibus* paper refers to a number of features of the actual firm including the extent to which the regulated asset is part of a wider corporate structure and the extent to which credit rating agencies may require an actual firm to take countermeasures to prevent a rating downgrade. None of this is relevant to the application of a financeability test to the benchmark firm.

The Concurrent Evidence sessions identified that a particular firm may be able to implement its own remedial measures to address a financeability problem. For example, in practice a firm may be able to

[265] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 124.

maintain an investment grade credit rating by reducing its gearing. But this has nothing at all to do with the benchmark firm and whether the allowed return supports the credit rating that is assumed in deriving it.

Rather, ENA considers the question of financeability tests to be a simple one:

- If it is correct that the allowed return should support the credit rating that is assumed in deriving it, the financeability test would be applied to the benchmark firm via the PTRM in the manner proposed by ENA; and
- If it is considered to be acceptable for the allowed return to be insufficient to support the credit rating on which it was based, a clear statement of that position would be provided, together with supporting explanations.

Recommendation 27: Perform a financeability assessment on the benchmark firm

The 2022 RoRI should include a financeability assessment on a notional benchmark firm. The allowed return on capital should be sufficient to support the credit rating that was assumed when computing it.

12.4 Historical profitability metrics

The *Final Omnibus* paper concludes that historical profitability metrics do not provide information on the expected rate of return and have no role in the RoRI process. [266]

ENA agrees with this conclusion and with the reasons set out the *Final Omnibus* paper. [267]

12.5 Investment trends

The *Final Omnibus* paper concludes that investment trends do not provide information that is sufficiently clear and precise to have a useful role in the RoRI process. [268]

ENA agrees with this conclusion and with the reasons set out the *Final Omnibus* paper.

ENA proposes that the AER might monitor discretionary network investment. A significant and sustained reduction in such discretionary expenditure is likely to be of considerable concern to the AER as the Australian economy decarbonises. But ENA agrees that this exercise falls outside the RoRI process, given the inability to construct a reliable and precise mapping between discretionary expenditure and allowed returns.

12.6 Scenario testing

The ENA September 2021 submission on the *Overall rate of return* proposed that it is important to test whether the RoRI is robust to a range of different future scenarios.[269]

In this regard, ENA notes that the financial market conditions at the beginning of the current RoRI (i.e., early 2019) are very different from the conditions in early 2020, which are different from current

[266] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 133.
[267] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, pp. 133-134.
[268] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, pp. 135-136.
[269] ENA, September 2021, *Overall rate of return*, pp. 40-41.

conditions. It is important that the RoRI is robust to, and provides sensible allowances across, the range of financial market conditions that might be reasonably contemplated over the life of the instrument.

Ensuring that the RoRI is robust to a range of future market scenarios is more important for the AER than for other regulators, due to the nature of the binding instrument legislation. Whereas other regulators are able to make decisions that are informed by all relevant evidence at the time of the decisions, the Australian framework forces the AER to bind itself at the time of each RoRI for decisions that might be made up to four years later. Thus, the RoRI must be robust to the range of conditions that might occur over that four-year period.

The *Final Omnibus* paper concludes that scenario testing may have a number of benefits for consumers and concludes that:

> *By modelling the rate of return (and regulated revenue) under different scenarios, we may be able to identify whether some options are more stable across a range of scenarios than others. Scenario testing can also help stakeholders to better understand the impact of alternative proposals on prices levels, price stability and price changes over time. This can promote broader discussion on these themes.* [270]

ENA would add one additional benefit – scenario testing would also indicate the sorts of market conditions under which network charges would increase or decrease. For example, under some approaches the total allowed return on capital remains relatively stable over different scenarios and under other approaches the allowed return will tend to increase in scenarios when interest rates rise.

Thus, scenario testing would provide consumers with insights not just into the *level* of the allowed return, but also into the extent to which the regulatory allowance might vary with consumer income and costs. Scenario testing is also informative of the AER's task and stakeholders' views on the regulators proposed rate of return approach with reference to its Assessment Criteria 6 (sufficient flexibility to market conditions) and Criteria 8 (longevity or sustainability of arrangements) as well as Criteria 7 (materiality).

The *Final Omnibus* paper recognises the constructive engagement between stakeholders on this issue and the AER's intention to further explore the implementation of scenario testing. It also poses several additional questions for stakeholders to consider in relation to scenario testing.

ENA's responses to these additional questions are set out below.

Can scenario testing be used to identify potential areas of concern?

- Scenario-testing could be used in two distinct ways through the 2022 and future RORI processes:
  - *Input into design decisions* - In evaluating potential regulatory policy options (e.g. approach to relationship of MRP and risk-free rates) the AER can run the model using its preferred inputs to understand how a particular approach could respond to a different set of plausible futures, in comparison with other approaches it might be considering.
  - *Information to stakeholders* – Where a design approach is settled, scenario testing outcomes could be included in the Explanatory Statement to illustrate that AER has consciously considered the potential 'envelope' of revenue, pricing, investment incentives and rates of return under a set of plausible conditions.

[270] AER, December 2021, *Overall rate of return, equity and debt omnibus: Final working paper*, p. 141.

- Scenario testing can therefore be used as an additional evaluative 'lens' for proposed draft and final instruments at the level of the overall cost of equity, debt, and final rate of return.
- Scenario testing would not be intended, or fit for the purpose of, identifying particular or specific areas of concern (e.g. for example, issues of concern on selected parameter values).
- Evaluating the cost of debt, equity and overall trends in allowed rate of return, however, usefully enables a regulator to take a step back from the detailed implementation and parameterisation of the foundation CAPM model, and consider the envelope of potential outcomes for the cost of debt, equity and overall rate of return under a set of plausible scenarios.
- The result of this might be that no concerns arise, in which case the exercise still has value in allowing the regulator and all stakeholders improved transparency on the possible set of outcomes that could arise in a set of plausible scenarios.
- One example of a possible broad area of concern could be the relativities of cost of debt and equity allowances that arise in some scenarios, where proposed approaches apply.
- As discussed above, this can assist in providing information relevant to judgements the AER is considering or makes against its Assessment Criteria – for example Criterion 6 (sufficient flexibility to market conditions) and Criterion 8 (longevity or sustainability of arrangements) as well as Criterion 7 (materiality).

How might the rate of return Instrument be made robust to those concerns?

- The conducting of scenario testing is a commonly applied tool across a range of regulatory and policy agencies to help explore the robustness of proposed approaches.
- Having conducted a scenario testing of the regulator's proposed approach in preparing the draft Instrument, the AER would have full discretion as to the manner and nature of any adjustments it considered might be appropriate following scenario testing.
- An additional use of scenario testing could be the AER identifying a preferred and alternative option in a specific allowance area, and highlighting to stakeholders the flow through consequences of each option to the shape, volatility and performance of the cost of equity, debt and overall rate of return.
- Ultimately the AER would need to form a view as to whether any of the outcomes of scenario testing warranted re-evaluation or further exploration of any AER proposed approach in a specific area.
- ENA considers the overall robustness a rate of return instrument would be enhanced by a clear and symmetrical publication of the range of possible outcomes under key scenarios, and the capacity of individual stakeholders to model and assess their own scenarios (a feature ENA's indicative model provides).
- The alternative of no scenario modelling being analysed would result in stakeholders and the AER having no shared understanding or awareness of the likely performance and interaction of Instrument across a range of plausible future market conditions. This increases the likelihood of stakeholder or regulatory 'surprise' at Instrument outcomes, potentially undermining the robustness and sustainability of both the Instrument and the underlying framework.

Can, and should, the AER prioritise one (or some) scenario/s over others? How would this interact with our aim to set an unbiased estimate of the rate of return?

- As highlighted in the ENA-CRG Technical Workshop session on this topic, ENA does not consider the selection of a 'central' or more probable scenario is of significant value.

- This is consistent with the practice of many other regulators and prudential agencies who conduct scenario testing to better understand the characteristics and possible performance of proposed approaches to a set of plausible scenarios, rather than as a predictive tool.
- ENA has proposed three scenarios which it considers intuitive and potentially informative based on: continuance of existing conditions, future decisions encountering risk-free conditions experienced by comparable regulators internationally, and a reversion to historical risk-free rates. There may be other scenarios which the AER or stakeholders wish to consider.
- As no prioritisation of the scenarios is proposed, no particular interaction with the AER's aim of setting an unbiased rate of return arises. For the avoidance of doubt, the occurrence of any particular value or outcome of scenario testing would not be proposed to be trigger for regulatory action or modification of approach. Rather, the scenario testing simply provides the AER with enhanced forward visibility of the type of values and outcomes that could plausibly arise, allowing for the regulator and stakeholder to be better informed.
- The conduct of scenario-testing is therefore consistent with the task the AER has defined for itself of an unbiased estimate of the market-based rate of return.

Should we factor in the burden it would place on stakeholders?

- ENA appreciates the need and priority around minimising regulatory burden on stakeholders.
- Publication by the AER of a range of potential cost of equity and debt, as well as overall rate of return values that might arise under its proposed decision answers a fundamental stakeholder question in relation to any regulatory decision 'what could this decision mean in the future?'
- As such, ENA considers it provides a valuable additional set of information to stakeholders and the regulator produced using transparent tools already familiar to stakeholders (e.g., the PTRM).
- One informational burden that might be claimed to arise is in understanding of why particular scenarios were chosen, and understanding the final impacts implied by the different scenarios.
- In this regard ENA would propose two approaches:
  - The use of simple scenarios based on clearly plausible pathways for the risk-free rate: as an example, ENA proposed three scenarios based respectively on conditions encountered already by multiple other developed country regulators, the continuation of current risk-free rates, and the reversion to previously observed historical levels of risk-free rates under pathway based on work of other Commonwealth economic agencies (Treasury budget scenarios and Intergenerational Reports).
  - The scenario outcomes being linked to indicative pricing impacts on a simplified basis (for example, $per household impacts) in the same manner as the AER provides indicative pricing impacts of other major determinations.
- ENA considers that it is important to also evaluate the potential additional stakeholder risks and burdens of a lack of transparency around the potential future pathways of returns. A lack of transparency and unanticipated impacts from proposed AER approaches has the potential to result in substantial stakeholder informational and other costs, as resources are spent on understanding how and why AER approaches are resulting in particular types of return allowances, and whether such outcomes were contemplated in the design and implementation of current arrangements. An example of these types of costs is provided by the considerable resources spent by consumers and energy users to understand and evaluate past AER 'on the day' cost of debt variations.

Recommendation 28: Conduct and publish scenario testing

The 2022 RoRI should include a small number of published scenario outputs for the cost of equity, debt and rate of return under a set of scenarios considered plausible by the regulator. These should focus on providing stakeholders with a reasonable sense of the potential outcomes of applying the Instrument on estimates of the rate of return across a set of foreseeable market conditions.

13 Issues for consideration by the Independent Panel

1.1 The context of this review

When considering the allowed return on equity, the relevant context is that:

- The AER's allowed return on equity is currently lower than at the time of any previous review.
- The Brattle report commissioned by the AER demonstrated that the AER's allowed return on equity was, by every metric, lower than that of all comparable regulators that were examined. Brattle concluded that the AER's approach was "not as effective" as that of other regulators.
- The independent expert valuation reports prepared as part of the recent Spark Infrastructure and AusNet Services transactions concluded that the current market cost of equity capital (with gearing at 60%) is 7.5 – 8% while the AER's current allowance is 5.5%.
- Networks are being asked to invest very material amounts of new capital to support and enable the decarbonisation of the Australian economy.

We explain this context in Chapter 3 of this submission.

1.2 The term of the risk-free rate

The possibility of a change in the term of the risk-free, from 10 years to 5, would have to be considered in the following context:

- The AER has considered this issue several times before (2009, 2013 and 2018 rate of return reviews) and has adopted a 10-year risk-free rate in every one of its decisions to date.
- In its 2018 review, the AER noted that a 10-year term:
  - Reflects the actual practices of investors, including investors in regulated assets. ENA has submitted extensive evidence on this, including the recent independent expert reports prepared for the Spark and AusNet transactions;
  - Is more consistent with the theory of the SL CAPM; and
  - Best reflects well accepted academic literature.
- A 10-year risk-free rate (or longer) is standard regulatory and commercial practice and is recommended by all leading textbooks.
- No stakeholder has advocated for a change in the term.

ENA considers that, in this context, it would seem reasonable to require a high bar for such a change. The current approach should only be changed if the AER were very sure that standard regulatory and commercial practice, and previous AER analysis of the issue, was wrong.

However, the AER has not identified *any* new evidence to support a change in approach. The same consultant has provided the same advice to the AER since its inception.

Chapter 7 contains ENA's submissions on this issue.

1.3 Equity beta

ENA questions whether having regard to a domestic comparator set that contains only a solitary live firm – to the exclusion of all other evidence – is a reasonable approach.

Other Australian and NZ regulators have recognised the problem of a very small set of domestic comparators and have regard to international comparators.

Several other regulators report estimates of the equity beta of regulated energy networks. The ERA (Western Australia) adopts a (like-with-like) equity beta of 0.79 and all others adopt betas above 0.8 – these estimates are 30% or more higher than the AER's current allowance.

Chapter 9 contains ENA's submissions on this issue.

1.4 Market risk premium

The AER's 2018 approach was to set the MRP allowance to the long-run historical average of observed excess returns. This approach produces essentially constant estimates of the MRP, whereas all experts in the AER's concurrent evidence session agreed that the true MRP varies over time with financial market conditions.

ENA has proposed a 'calibrated DGM' approach to estimating the prevailing, forward-looking MRP. This approach adopts the AER's preferred DGM specification, with a small modification to address the issues raised by the AER in 2018.

Since the DGM approach has a strong theoretical basis and provides useful evidence about the forward-looking MRP, the AER should have regard to it. DGM specifications that are economically sensible and which address the AER's previous concerns (such as the calibrated DGM) should be used to inform the MRP allowance.

Having regard to the DGM evidence will enable the MRP estimate to have some variation over time, reflecting the prevailing market conditions at the time of the RoRI.

(ENA also proposed an approach for updating the MRP allowance during the term of the RoRI so that the risk-free rate and MRP could both reflect the prevailing conditions at the time of each determination made under the RoRI, but accepts that the AER has ruled out that approach.)

Chapter 8 contains ENA's submissions on this issue.

1.5 RAB multiples, recent transaction evidence and independent expert estimates of required returns

A specific issue of contention in the review has been whether any weight should be attributed to RAB multiples in the rate of return estimation process, and specifically whether these can reliably be used to form conclusions about the adequacy of existing return allowances.

The AER had the position until 2018 of explicitly attributing no weight to multiples due to the range of commonly acknowledged problems that arise with the estimation and interpretation of these multiples.

Any aggregated RAB multiple will reflect not just the present value of expected regulatory allowances, but also the present value of incentive payments, revenue from unregulated assets and future projects, expected increases in future AER allowances, and other things.

It is entirely possible that the present value of expected regulatory allowances is less than the RAB, even though the aggregated RAB multiple is above 1 – due to these other sources of value. Consequently, RAB multiples have zero informative value unless the present value of expected regulatory allowances can be fully and transparently separated from other sources of value.

Independent expert estimates of the market cost of equity capital have recently been prepared for two electricity network businesses that are regulated by the AER. Both report that the current market cost of equity capital is materially *higher* than the AER's current regulatory allowance. ENA considers this to be highly relevant and informative evidence.

With the recent Spark and AusNet transactions, there is one remaining opportunity (APA Group) to observe a transaction multiple, and trading multiples will only be available for that single firm while it remains listed. Consequently, the question of what use might be made of RAB multiples has become somewhat theoretical.

Chapter 12 contains ENA's submissions on this issue, and ENA has also submitted an independent report from the advisory valuation firm Grant Thornton which explores these issues further.

14 Recommendations

Recommendation 1: Separate term for inflation and allowed return on capital

There is no link between the efficient cost of capital in financial markets and the mechanics of the AER's treatment of regulatory inflation within the PTRM and RFM. Consequently, the terms for regulatory inflation and the allowed return on capital are independent.

Recommendation 2: Term for debt and equity should reflect what investors require

The allowed return on debt should reflect the term that debt investors use when determining the return they require.

Similarly, the allowed return on equity should reflect the term that equity investors use when determining the return they require.

Recommendation 3: Maintain 10-year trailing average approach

The AER should maintain its 10-year trailing average approach to the allowed return on debt. This approach is consistent with efficient financing practice and with the observed practice of regulated networks, and it avoids a complex transition mechanism being implemented before the existing transition is complete.

Recommendation 4: A high bar for change should be applied to the term of the risk-free rate

It is reasonable to apply a high bar for change to the term of the risk-free rate, given that:

- The AER has considered this issue several times before (2009, 2013 and 2018 rate of return reviews) and has adopted a 10-year risk-free rate in every one of its decisions to date.
- In its 2018 review, the AER also noted that a 10-year term (a) Reflects the actual practices of investors, including investors in regulated assets. ENA has submitted extensive evidence on this, including the recent independent expert reports prepared for the Spark and AusNet transactions; (b) Is more consistent with the theory of the SL CAPM; and (c) Best reflects well accepted academic literature.
- A 10-year risk-free rate (or longer) is standard regulatory practice.
- A 10-year risk-free rate (or longer) is standard commercial practice. Notably a 10-year rate was adopted in the two recent transactions that involve businesses regulated by the AER.
- A 10-year risk-free rate (or longer) is recommended by leading textbooks, including Australian and regulatory textbooks.
- No new evidence has been presented in this review.

Recommendation 5: The approach to debt and equity should be the same

For equity, like debt, the allowed return should be set to match the market cost of capital.

Recommendation 6: The case for a 5-year term does not bear scrutiny

The case for a 5-year term does not bear scrutiny because:

- The Lally derivations demonstrate no more than that NPV=0 requires that the regulatory allowance is set equal to the return that investors require.

- A 5-year term also requires that the market value of the regulated asset at the end of the regulatory period is known – at least to the extent that investors can value the network without regard to any cash flows beyond the regulatory period. This is clearly inconsistent with real-world observation.
- Applying the single-period CAPM to value the first five years of cash flows generated by a long-lived asset, independent of all subsequent cash flows, is inconsistent with finance theory. That might explain why such an approach is not applied in practice, including for regulated assets.

Recommendation 7: A 10-year term should be maintained

A 10-year risk-free rate should be maintained in the 2022 RoRI. The case for a 5-year term falls well short of any reasonable threshold at this time.

Recommendation 8: No geometric means

Geometric means have no role to play in the AER's regulatory task. There is no rationale for having regard to geometric means and there are consistent and clear explanations from a range of sources as to why arithmetic means must be used in the AER's process.

Recommendation 9: Disregard Mathews (2019)

The Mathews (2019) analysis of historical excess returns is so affected by a range of fundamental problems that no regard should be given to it.

Recommendation 10: Have regard to DGMs (sensible specifications only)

The DGM approach has a strong theoretical basis and provides useful evidence about the forward-looking MRP. DGM specifications that are economically sensible and which address the AER's previous concerns should be used to inform the MRP allowance in the 2022 RoRI.

Recommendation 11: Consultants and experts advocate for Wright approach

ENA agrees with the advice of consultants and experts through the review – that there is at least as much evidence to support the use of the Wright approach as for the historical excess returns approach.

Recommendation 12: Do not explicitly rely on HER evidence alone

The MRP allowance should not be set on the basis of the HER evidence alone. That approach embeds the strong assumption that the MRP is effectively constant over time, which is inconsistent with the evidence and advice before the AER.

Recommendation 13: Do not effectively rely on HER evidence alone

There is no basis for using DGM (or other) evidence to select an estimate from within the range of HER estimates. The primary value of the DGM evidence is not in identifying which historical average might be more informative, but in identifying market conditions where the prevailing MRP might be different from the historical average.

Recommendation 14: Have real regard to all relevant evidence

ENA remains of the view that an approach that updates the MRP to reflect changes in the risk-free rate is most likely to produce internally consistent estimates of the allowed return on equity, but accepts that the AER has ruled out that approach.

The MRP allowance in the 2022 RoRI should be set by having real regard to all relevant evidence. The AER should apply its regulatory judgment, considering the strengths and weaknesses of each piece of evidence to produce an MRP allowance at the time of the RoRI.

Within the set of approaches that remain under consideration, ENA's view is that an approach that fixes the MRP for the duration of the RoRI is likely to be the only viable approach.

Recommendation 15: No survey evidence

Survey evidence is of such low quality that it should not be used to inform the estimate of the MRP. To the extent that survey evidence *is* used, it is important to consider the whole of the response and not just part of it, and to consider only contemporaneous surveys.

Recommendation 16: Use a long data period (10 years)

ENA agrees with the AER's preference for estimating beta using a longer data period than the 2-5 years recommended by some of its consultants.

ENA proposes that a 10-year period provides a reasonable balance between recency/relevance and statistical stability.

Recommendation 17: Unsafe to rely on a data set with a single live comparator

The 2022 RoRI should not rely exclusively on a data set that consists of one live comparator. It should explain what other evidence the AER considers to be relevant and how that other evidence will be given more weight as the quality of the domestic evidence on beta deteriorates.

Recommendation 18: Have regard to the approaches adopted by comparable regulators

When setting the equity beta, the AER should have regard to the approaches and estimates of regulators performing a comparable task. Comparable regulators have regard to a broader set of evidence and have set equity beta allowances very materially higher than the AER's current figure.

Recommendation 19: Have regard to the evidence of low-beta bias

The AER should have regard to the established empirical evidence of low-beta bias when exercising its judgment in setting the allowed return on equity.

Recommendation 20: Have regard to all relevant evidence, including international comparators

When setting the equity beta, the AER should have regard to evidence from domestic and international comparators and the approaches and estimates of regulators performing a comparable task.

Recommendation 21: Retain independent third-party data sources

The AER should continue to set the return on debt allowance on the basis of independent third-party data sources.

There is no case for any adjustment in relation to the EICSI.

Recommendation 22: Rule out asymmetric adjustments

The AER should rule out ever using the EICSI to place a cap on the return on debt allowance. Such an approach would introduce a bias and would only be appropriate if the AER was targeting average under-performance relative to its allowance.

Recommendation 23: A full consultation on the commercial viability of major new projects is required

There is an urgent need for consultation on how the AER's rate of return allowance might support the commercial viability of major new projects. If that consultation cannot be accommodated within the RoRI process, a separate process should be commenced as soon as possible.

Recommendation 24: No regard to RAB multiples

The 2022 RoRI should have no regard to any RAB multiple unless it can be accurately disaggregated by removing all components of enterprise value other than the present value of current regulatory allowances on the existing RAB.

Recommendation 25: Recent independent expert estimates are highly relevant evidence

The 2022 RoRI should have regard to recent independent expert estimates of the required return on equity. This is clearly relevant evidence about the market cost of equity capital.

Recommendation 26: Have regard to what comparable regulators do

The 2022 RoRI should have regard to the data, methods, and regulatory judgment exercised by comparable regulators engaged in a comparable task.

Recommendation 27: Perform a financeability assessment on the benchmark firm

The 2022 RoRI should include a financeability assessment on a notional benchmark firm. The allowed return on capital should be sufficient to support the credit rating that was assumed when computing it.

Recommendation 28: Conduct and publish scenario testing

The 2022 RoRI should include a small number of published scenario outputs for the cost of equity, debt and rate of return under a set of scenarios considered plausible by the regulator. These should focus on providing stakeholders with a reasonable sense of the potential outcomes of applying the Instrument on estimates of the rate of return across a set of foreseeable market conditions.