Dampier Bunbury Pipeline
Part of Australian Gas Infrastructure Group

ERA Draft Rate of Return Instrument

AGIG submission

September 6 2022

1. Introduction

This submission responds to the ERA's draft Rate of Return Instrument (RoRI), issued on 17 June 2022. By and large, we believe the ERA has come to a reasonable outcome in most parts of the Draft RoRI. For example:

- We believe the ERA's approach to the cost of debt, including debt raising costs, is largely acceptable and we have only minor comments.
- We believe the ERA's decision to keep gearing at 55 percent is reasonable.
- We believe the ERA's decision to maintain gamma at 0.5 is reasonable.
- We believe the ERA's approach to inflation remains reasonable.

In these areas, we comment briefly on the ERA's approach and, where appropriate, respond to the views of other stakeholders and the Independent Panel.

Our main focus is on the return on equity where we:

- Agree with the ERA's new approach to the term of the risk-free rate.
- Accept the number the ERA has used for beta and the evidence the ERA has used to derive the number, but provide some feedback on a more transparent way to treat the evidence that the ERA has used, which we hope might give stakeholders more clarity.
- Discuss our issues associated with the way in which the ERA has determined the MRP, which is our main concern

Before we respond to the ERA's draft RoRI, we raise two points related to the process of making the RoRI. Firstly, we note that to date no public forums associated with the Draft RoRI have been held. Stakeholders also have not yet had an opportunity to engage or present to the ERA Governing Body who will ultimately make the Final RoRI and many of whom are new to the process. We respectfully suggest that it would be of assistance to all stakeholders and the Governing Body if it could ask questions directly, rather than all information being filtered through written submissions, with no ability to ask clarifying questions. We would encourage the ERA to consider this additional step in the process before the final RoRI is made.

Secondly, submissions to the Draft RoRI were due on September 2, but the ERA only published the Independent Panel's review on August 24. The ERA provided a short extension of four days, two of which were a Saturday and Sunday. For this reason, we have not been able to provide as much attention to the Independent Panel report as we would have liked and may wish to make further comment on the report in due course.

2. Cost of equity

In this section we cover the return on equity. Our main focus is on the market risk premium (MRP) as this is where our most substantive differences with the ERA lie. However, we also provide our views on:

- The ERA's change in view in respect of the term of the risk-free rate for equity.
- The process by which the ERA determines beta.
- The ERA's use of cross checks for equity
- The averaging periods proposed by the ERA (we treat debt and equity together as the same issue affects both)

2.1. Term of the return on equity

Perhaps the most substantive change in approach by the ERA is the shift from the use of a five to a ten year risk-free rate. This is something that we have long supported, and we are obviously pleased that the change has been made.

Whilst this has been an area of considerable debate in Australia over the past decade, the particular way in which the ERA frames the choice in the Draft RoRI adds clarity both to the debate and to the best way forward. That is, the ERA suggests that there are two rates the regulator could set, namely (see [590]):[1]

- A "regulatory rate", which considers what a regulator ought to do if a set of assumptions from one particular model happen to be true; or
- A "competitive rate" which matches what can be seen as the required rate in the marketplace.

The crux of the issue the ERA faces is neatly summarised in a recent presentation by APGA to the AER, which contains the following equation:

$$V_0 = \frac{\sum_{t=1}^{T} r_t RAB_t + \sum_{t=1}^{T} D_t}{(1+k_t)^t} \quad (1)$$

V_0 is the value of the business to equity holders at the outset of analysis, r_t is the allowed rate of return, D_t is depreciation and k_t is the required rate of return;[2] essentially, abstracting from opex and tax, the value of the business is the discounted value of the return on and return of invested capital in the form of the RAB.

The regulator sets r_t, but has no influence over k_t; investors will not change the way they discount cashflows just because a regulator has set a certain r_t to determine those cashflows. Instead, if $r_t < k_t$, because the regulator has chosen the "regulatory rate" (in the ERA's context) and has ignored the "competitive rate", then this will render investment in the regulated business NPV negative from the perspective of investors, and the investors will invest elsewhere. This is essentially the conclusion the ERA has itself reached in its Draft RoRI when it notes (see [601]) that it:

> *….considers that should investors expect a longer -term return on equity, a shorter-term will lead to negative NPV outcomes. Setting a short-term rate*

[1] *See ERA, 2022, Explanatory Statement for the 2022 Draft Gas Rate of Return Instrument, June 2022, available here. Note that paragraph references without a source in this document refer to the ERA's Draft RoRI; full citations have not been included for brevity.*
[2] *We note that the AER appears to have confused the distinction between k_t and r_t it its algebra; see ENA 2022, Rate of Return Instrument Review: Response to the AER's draft instrument and explanatory statement, 2 September 2022, p55.*

> *would not best meet the NPV=0 principle, nor would it support efficient signals for both network owners or consumers.*

And further (see [599]) that an advantage of using the ten year rate is that it:

> *Does not disadvantage regulated assets which have to compete for funding with unregulated infrastructure with similar risk. Regulated infrastructure investments must compete for equity capital with similar unregulated investments, for which the required return is typically based on a 10-year term for equity*

Setting r_t different from k_t is not a matter of mis-estimation of the opportunity cost of capital but rather creating NPV-negative investment conditions by design and as part of a deliberate choice by the regulator. Providing an allowed rate of return which gives an outcome which will be NPV-negative for investors is inconsistent with the requirements to promote efficient investment in the long term interests of consumers contained in the National Gas Objective and Revenue and Pricing Principles.

A key part of the regulatory debate in Australia has been the work of Dr Lally.[3] The ERA has correctly identified several flaws in Dr Lally's framework in that it requires that the market value of the end of the regulatory period equals the RAB (see [593] and [594]) and that it in fact does nothing to indicate what the required return actually is (see [596]). We note that the AER's CRG also put considerable effort into dissecting Dr Lally's framework, ultimately coming to very similar conclusions to the ERA.[4]

We raised our concern with the reliance on Dr Lally's work by regulators in our February submission (see p12). In response, Dr Lally said:[5]

> *"Secondly, AGIG argues that the fundamental proposition (that regulatory use of the five-year cost of equity will satisfy the NPV = 0 test) derives from Lally (presumably Lally 2004), it is not supported by mainstream financial literature, and it should be independently assessed. However, AGIG's view that the fundamental proposition derives from Lally (2004) is not correct; the proposition derives from Schmalensee (1989), who shows that satisfying the NPV = 0 test requires that the aggregate depreciation allowed matches the initial investment and the allowed rate for each regulatory cycle equals the cost of capital for the same period. To quote from Schmalensee (1989, page 296): "The Invariance Proposition rests on the assumption that the regulated firm's actual rate of return on the book value of its assets is adjusted each period to equal the current one-period interest rate". Rather than being the source of this proposition, Lally (2004) merely extended Schmalensee's analysis, which admits uncertainty only over future interest rates, to cost and demand risks, as stated in Lally (2004, page 18)."*

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[3] See further AGIG, 2022a, AGIG Submission to ERA 2022 Rate of Return Instrument Discussion Paper, February 2022, available here, pp12-13. We note that the AER's Draft RoRI purports to step away from Dr Lally's framework, but the analysis is essentially the same. The issues associated with it are covered in detail in the ENA's submission to the AER (see ENA 20222a, pp53-62), and summarised in the ENA's submission to the ERA (See ENA 2022b, Rate of Return Instrument Review: Response to the ERA's draft instrument and explanatory statement, 6 September 2022, pp8-11)

[4] See AER CRG, 2022, CRG Response to the AER's December 2021 Information Paper, March 2022, available here, pp47-57.

[5] See Lally, M 2022 , The Appropriate Term for the Allowed Cost of Equity, April 2022, available here, p25. Immediately after this quote, Dr Lally notes that we have made use of the same Schmalensee paper and must therefore hold it in high regard. Indeed we have and indeed we do. However, as we point out in AGIG 2022a (see p13) we use the insights associated with depreciation from this paper. The mere fact that we regard a paper as important does not mean that we agree with every other paper which cites it.

It is in this context that a submission made by the ENA to the AER process in the form of an expert report from Professor Schmalensee is particularly pertinent. In response to a similar quote as that provided above, Professor Schmalensee notes that:[6]

> *"Dr. Lally does not show how this conclusion follows from the analysis in Schmalensee (1989). Instead he introduces a rather different two-period model to support it, and AER (2022) presents two different two-period models to support the same conclusion. As I discuss below, all are fundamentally inconsistent with the model presented in Schmalensee (1989) and summarized above.*
>
> *In fact, Dr. Lally's characterization of Schmalensee (1989) is almost exactly backwards."*

Professor Schmaalensee goes on to say that his own 1989 paper (see ibid, p9) *"certainly does not "show" that the term of the allowed return must match the term of the regulatory cycle"*, but rather that *"efficient regulation generally requires that the allowed rate of return must be consistent with the return required by investors – however they determine it"* and that he has *"no idea why Dr. Lally thinks that Schmalensee (1989) implies that this estimate (of the allowed cost of capital) must depend precisely on how often it is computed"*. In respect of Dr Lally's mathematics, he suggests that they contain "*an amazing bit of sleight of hand*".

Difference on opinion between academics are common, but when the author of the work which Dr Lally characterises as the foundation of his own work suggests that Dr Lally has mis-characterised and misunderstood his own work, this ought to given weight by regulators.

The Independent Panel does not express a preference for five versus 10 years, and suggests that an argument could be made for each.[7] It seeks a stronger rebuttal of Dr Lally's arguments or a compelling proof in respect of the ten year term.[8] We note in the context of the former that the report by Professor Schmalensee, which was not available to the Independent Panel would serve as a rebuttal, and believe that the latter has been established by the ERA where it notes firstly that failure to provide a rate of return which replicates the market cost of capital would be NPV negative (see [601]) and secondly that investors do use 10 years for long-lived infrastructure assets (see [590]).

The Independent Panel also suggests that the ERA's use of a ten-year risk-free rate for equity and a five-year risk-free rate for debt is inconsistent.[9] We do not believe this to be the case. The ERA explicitly provides a ten year return for equity holders and a ten-year return for debt holders. The fact that the latter involves a five year swap rate plus the cost of swapping ten year for five year debt rather than the ten year swap rate does not alter this basic fact. In fact, we believe the ERA has removed an inconsistency which existed previously when it provided a five year return for equity and a ten-year return for debt.

As a final point, we turn to the issue of inflation. The ERA concludes (see [604]) that the three terms do not need to be equal and that ten years is appropriate for equity, five years for the swap rate for debt and five years for inflation. We agree with these conclusions.

In the AER process, inflation and its link with equity (and debt) are much more confused. Up until its December working paper the AER's views were essentially the same as those put forward by

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[6] See Schmalensee, R, 2022, Statement of Richard Schmalensee PhD to the Australian Energy Regulator, July 2022, p7, attached to ENA 2022a
[7] See Cosgrove, M, Etheridge, L and Smales, D, 2022, Independent Panel Report on the ERA's 2022 Draft Gas Rate of Return Instrument, August 2022, available here, p14 & 37.
[8] Cosgrove et al, 2022, p38.
[9] Cosgrove et al, 2022, p14 & 134.

the ERA in its Draft RoRI.[10] However, in its Draft RoRI, the AER appears to have changed its view, asserting that consistency between inflation and equity (though not, curiously, debt) is now very important. However, the AER provides no explanation as to why this change has occurred, other than by some references in footnotes.[11]

We are aware that the AER's CRG, despite rejecting Dr Lally's model, do favour consistency between equity and inflation,[12] and this appears to have had some bearing on the AER's change.[13] The AER's CRG also argued for consistency between inflation and equity during the 2020 inflation review, but some context is necessary to show why that view in 2020 does not mean that the same tenor is the right answer today.

In 2020, the AER's CRG argued that the term for inflation should match the term allowed for equity (and the direction of causation is key here), because, it argued, the regulator provides a real return, and thus should make sure that the inflation it uses to determine a real WACC matches the term of the allowed return on equity.[14] However, due to the way real returns are delivered in the regulatory framework, via indexing the RAB, the AER ultimately chose not to take up this view from the CRG, and instead determined that inflation should ensure that what is taken out is what is expected to be put back in, which is five years of inflation; the same conclusion the ERA reaches (see [1265]).

Whilst the AER CRG's approach to inflation in 2020 was logically linked to the term allowed for equity, it is not logical, having taken a different approach to inflation (which has no link to equity) to now link the term for equity to the term for inflation. It is not clear that this is what the AER is proposing to do, but if it has informed its thinking, then this would be incorrect.

2.2. Beta

A key issue for regulators as circumstances evolve is identifying the threshold for change in long-standing regulatory approaches in order to meet the goal of achieving the National Gas Objective to the greatest degree. There is a risk that seeking the perfect approach becomes the enemy of a good approach that better achieves the objectives of the framework.

In the case of beta, there is a clear and obvious need for change because the set of live firms in the Australian energy market has now diminished to one, which is by no means sufficient to obtain an accurate beta estimate. Moreover, the energy sector is changing so rapidly that other solutions, such as going back further in time and resurrecting data from long-dead firms (as the AER does) is unlikely to be reflective of the relevant future environment.

The CRG has consistently provided a long list of potential problems which might eventuate if the ERA used other data sources (see [892], [911], [924] and [937] to [943]) with no evidence that these potential problems exist, or that they are significant.

In a recent submission, the CRG goes further than this.[15] Faced with statistical evidence clearly showing that there is no statistically significant difference between the betas of energy firms in other jurisdictions and those in Australia, the CRG falls back on statistical theory noting that failure to reject the null hypothesis does not mean that it is true. Whilst this is correct from the perspective of statistical theory (hypothesis testing tests for falsification, not truth), it does not

[10] *See ENA 2022 pp40-47.*
[11] *See AER, 2022a, Draft Rate of Return Instrument: Explanatory Statement, June 2022, available here, p104.*
[12] *See AER CRG 2022 p61-2*
[13] *See AER 2022a, pp113-14*
[14] *See AER, 2020, Regulatory Treatment of Inflation: Final position paper, December 2020, available here, pp28-46, and AER CRG, 2020, Advice to the AER on the Regulatory Treatment of Inflation, November 2020, available here, p12.*
[15] *See ERA CRG, 2022a, Review of International Equity Beta and Market Risk Premium Issues Raised in the ERA 2022 Gas Rate of Return Focussed Consultation Discussion Paper, 7 May 2022, available here, pp5-6.*

follow that one should therefore assume difference between Australian and international firms despite the lack of statistical evidence. The CRG has not provided actual evidence of difference between jurisdictions, but only assertions that it must exist.

We believe the ERA has adequately dealt with the concerns raised by the CRG (see [999] to [1048]) and we agree with the Independent Panel that it represents a good piece of pragmatic regulatory judgement that looks carefully at both relevant problems and avoids the problem of an inability to find the perfect solution to an issue preventing a good solution from being found.[16] We note also, as the ERA points out, that its reasoning has been widely adopted by other regulators facing the same problem, all of whom have overcome the CRG's list of potential, but untested, problems.

Our main issue with beta is not the evidence that the ERA has used or the conclusion it actually comes to for beta, but rather the process by which the ERA has gone from the former to the latter. The Draft RoRI is much clearer than the ERA's earlier work, but it still explains why the ERA continues to believe that 0.7 is the right answer for beta, rather than clearly and transparently moving from the evidence to the conclusion. This means that, as the evidence changes, it will be difficult for stakeholders to understand whether the ERA is likely to reach a different conclusion in 2026, or whether there is some unstated barrier in terms of a weight of evidence that needs to be overcome before the ERA will move away from 0.7.

We continue to believe that a focus on the ranges for beta which come from the different pieces of evidence is a fruitful and transparent process by which the ERA can derive its solutions.[17] However, rather than the range of average country results, that the ERA has used,[18] we believe the ERA should use the ranges within each country's results. Ideally, this range would focus on statistical confidence intervals of different country estimates (or of estimates for each company within a given country). The ERA has not published the standard deviations of its beta estimates, so we instead use the maximum and minimum company estimate for each country.[19] Note that we use both OLS and LAD information as we agree with the ERA (see [990]) that this is a good way of dealing with the potential for shocks. We note that the CRG has asked the ERA to explain its use of LAD (see [882]) and believe the ERA has done so adequately (see [990]).

One way of using this information, alongside regulatory judgement is shown in Figure 1. With the exception of New Zealand, the range from 0.7 to 0.8 is contained in the country ranges of all countries. The next most highly-performing range is the range of 0.6 to 0.7. Other ranges, both higher and lower than the range from 0.6 to 0.8 have progressively fewer countries with estimates in this range.

Choosing the band which has the greatest degree of congruence with the data would be one, relatively simple way of settling the range, and the ERA could then use its regulatory judgement to determine a point in the range by, for example:

- Considering that far more of the sample lie above 1 than below 0.5, pointing to a number towards the top end of the range which is most congruent with the data.
- Taking account of the issue of low beta bias and exercising caution towards the lower end of any range favoured by the data.[20]

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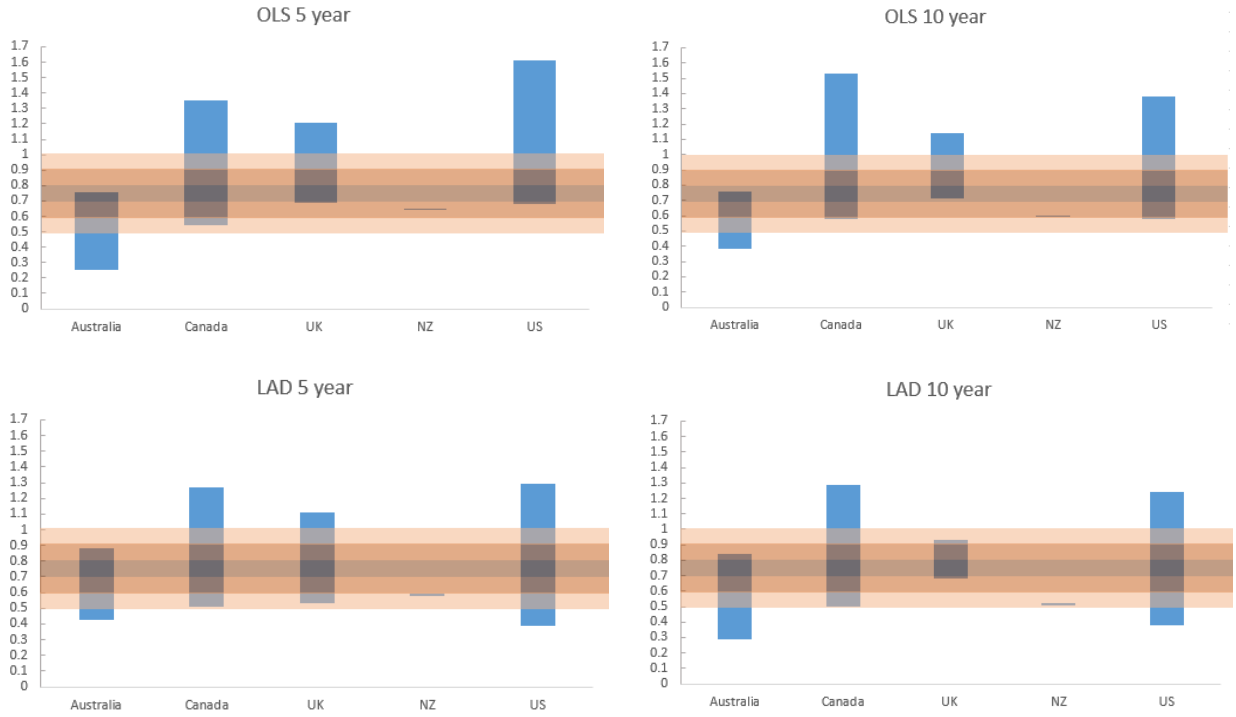
[16] *See Cosgrove et al 2022, p43.*
[17] *See AGIG 2022b, Letter responding to focussed consultation on beta and MRP, May 2022, available here, p4*
[18] *See ERA 2022, Tables 13 to 15, pp174-5.*
[19] *Published in Appendix 5 of the Draft RoRI. Note that we use Table 22, the target leverage as this is the appropriate comparison to use for the level of financial risk that the ERA deems efficient. It would be useful if the ERA published more details on how it has calculated these beta values beyond the methods and time periods used, to allow stakeholders to try and replicate its results. For example, the ERA describes how it will deal with merger and acquisition events (see [1062]) but, whilst we agree with the proposed methodology, the Draft RoRI does not explain what data have been removed following this method.*
[20] *We note that the ERA is minded not to pay any attention to low beta bias and that no new evidence has been presented in respect of it (see [998]). We would reiterate our point (see AGIG 2022a p29) that the ERA has not given adequate attention to the evidence it*

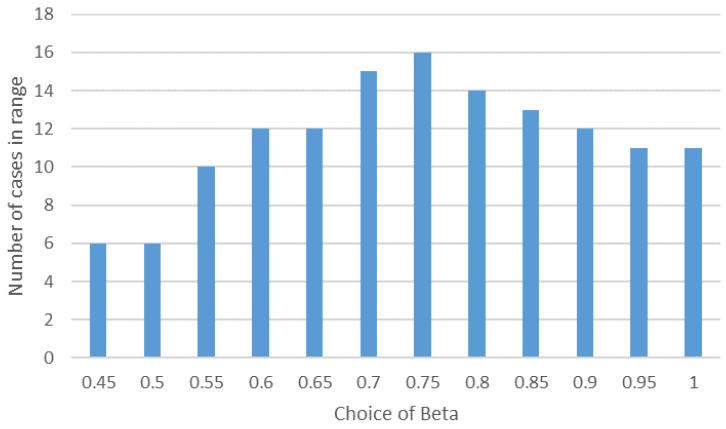
Alternatively, noting that the 0.6 to 0.7 range has almost the same congruence as the 0.7 to 0.8 range, the ERA could adopt a simpler judgement and choose the mid-point of the two ranges.

Figure 1: Beta estimates tested across country ranges[21]



A simpler way to make use of the same information from the ranges of estimates, which requires less judgement (and which arguably gives stakeholders less clarity on what those ranges actually are) is to take a set of numerical results for beta, and examine how many cases each results is congruent with. This is shown in Figure 2. Note that New Zealand is excluded, as it has no range, so the maximum number is 16.[22]

Figure 2: Number of cases for different beta estimates



already has, from both ex-ante and ex-poste data and that this, one of the most well-documented findings in all of finance, should not be ignored completely. There is no need for an explicit adjustment, but it should help inform the ERA's judgement.

[21] Note that New Zealand, with one firm, has no range. So that it shows up on the graph, we have added 0.01 to its beta value in each instance to give a ""maximum"

[22] New Zealand has one estimate near 0.65, two near 0.6 and one near 0.5, so including it by picking the closest 0.65 would increase the instances of a beta of 0.6 to 14, 0.65 to 13 and 0.5 to 7, which does not change the overall conclusions from the analysis above.

Here, the data show that a beta of 0.75 would be consistent with the maximum weight of the evidence the ERA is considering, with all 16 of the cases supporting this result. In fact, and choice of beta between 0.72 and 0.76 would sit within the ranges of all 16 of the cases. A beta of 0.7 sits within 15 of the cases, and one of 0.8 within 14 cases.

The simplest rule the ERA could follow would be one which chooses a beta which is consistent with the largest amount of the data under consideration. To two decimal places, this would be the range from 0.72 to 0.76 shown in Figure 2. If the ERA is rounding this to one decimal place, since most of the range sits below 0.75, this would lead to an answer of 0.7. This simple rule could be followed by any stakeholder, at any point in time, with whatever the set of beta estimates at that point in time were.

The decision processes described above are not the only ones the ERA could follow. Nor do we say that they are the ones which the ERA *should* follow. Instead, we suggest them as representative of the ways in which the ERA could use information from the ranges of data it has, alongside judgement (in respect of Figure 1; Figure 2 and the methodology attached to it makes limited use of regulatory judgement) in a process to derive beta which is transparent and can be followed by other stakeholders, with access to the same source data the ERA has used, or with new data as they become available, to understand what the ERA is likely to do in future.

As a final and technical point. In our submission (see Feb Submission p27) we noted the problem of double-counting whereby the ERA takes an average across the four firms, then forms portfolios and takes an average across those, and then takes an average of the two averages. The ERA notes that we have made this comment, but does not respond to it. Since the individual firms are already in both the equal-weighted and value-weighted portfolios, there is no additional informational benefit from taking the average across the firms in the sample. In the past (see references in our submission) the ERA has acknowledged this point and changed its approach and it is not clear why it has changed back to a prior approach which is in error. The practical effect of correcting this would be for the 5 year range for Australian firms in Table 14 of the RORI to be from 0.51 to 0.69, with an average of 0.6, and the ten year range would be from 0.52 to 0.6 with an average of 0.56; marginally higher than the ranges and averages the ERA has used.

2.3. Market risk premium

The ERA has determined that the MRP should be found using both historical excess return (HER) and the dividend growth model (DGM), giving a (fixed for the duration of the RoRI) value of 6.2 percent. This section focusses on three key areas:

- How the HER and DGM estimates are made
- How the HER and DGM estimates are combined to form an MRP estimate
- Whether and how the estimate made at the time of the RoRI is updated

2.3.1. Estimating models

In this section we comment on what we believe to be the most appropriate way to estimate historical excess returns and the DGM.

Estimating historical excess returns

Our issues with the estimation of the HER boil down largely to the issue of whether to use geometric means, how to use them if they are used, and which geometric mean to use. Our view is that the ERA:

- should not use the geometric mean at all given its regulatory task; but

- if the ERA does choose to combine a geometric mean with an arithmetic mean, the weightings the ERA uses are incorrect based on the literature the ERA itself cites; and
- the geometric mean that the ERA uses is the wrong one.

The geometric mean should not be used at all

In our previous submission, we provided expert evidence from CEG which showed very limited evidence of auto-correlation in the returns series which experts in the AER expert sessions and consultants for the AER's CRG note is the only real reason why one would seek to deviate from the use of arithmetic means in the first place.[23]

CEG have updated this evidence (which still shows no evidence of auto-correlation). CEG argues that, even if autocorrelation existed, this would not justify a departure from the arithmetic mean. CEG also notes that the ERA CRG first argued for the use of the geomean on the basis of autocorrelation, but then distanced itself from this rationale for assigning weight to the geometric mean and subsequently focussed on an "investment horizon" justification.[24]

CEG make two additional points which are worthy of consideration. Firstly, even if there had been evidence of auto-correlation, it certainly does not follow that using the geometric mean is the right response. Rather, the response should follow from the type of auto-correlation found. We note that the ENA make the same point.[25]

Secondly, the ERA appears to be linking its use of the geomean with the use of the 10 year term for equity, suggesting that it is appropriate for the long-term holder of equity, because compounding returns are a "reasonable expectation" for such an investor (see [768]). However, as CEG points out, the mere fact that an investor does invest for a long period of time does not mean that compounding is important; this in fact depends on the investment strategy being undertaken. Only where an investor is adopting an "invest and accumulate" strategy does the geomean have any role to play and, as we discuss below in the context of Indro and Lee (1997) and Jacquier et al (2003), in such a narrow circumstance, it is not the role which the ERA gives it.[26] There is no evidence that the ERA should assume that all long-term investors are adopting an "invest and accumulate" investment.

We note, finally, that geometric means are not widely used in practice by other regulators. This evidence is shown it Table 1. Although we were not able to find information from all Australian economic regulators, it is apparent that, for those who did provide the relevant information, the ERA is the only one which gives active weight to the geometric mean.

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[23] See AER, 2022b, Concurrent Evidence Session 3 – Proofed Transcript, February 20222, available here, p69, and Boyle G and Murray, K, 2022, Estimation of the Market Risk Premium and its Relationship to the Risk Free Rate in the Context of Regulation of Electricity and Gas Energy Networks: A report to the Australian Energy Regulator Consumer Reference Group, February 22022, available here, pp 44-6.

[24] See CEG, 2022, Estimating MRP for the ERA 2022 RoRI, August 2022, attached as an expert report to this submission, pp9-10. In the same report, CEG responds to the ERA, who suggest in the draft RORI (see [763]) that the limited evidence for auto—correlation found by CEG might change if different holding periods are used, and that perhaps the tests might have low power. Putting aside the fact that the existence of autocorrelation or otherwise is a distraction, we do not agree that the appropriate response to a test which does not find auto-correlation is to assume that perhaps doing the test with more data might give a different result.

[25] See ENA 2022b p15.

26 Indro, D & Lee, W 1997, "Biases in Arithmetic and Geometric Averages as Estimates of Long-Run Expected Returns and Risk Premia", Financial Management, 26, pp 81–90 and Jacquier, E, Kane, Al & Marcus, A, 2003, Geometric or Arithmetic Mean: A Reconsideration, Financial Analysts Journal, 59.

Table 1: Use of geometric and arithmetic means by Australian regulators

Regulator	Mean	Notes
ERA	geometric and arithmetic	
AER	arithmetic	See Draft RoRI p 134. Note that the AER calculates the geometric mean, but does not use it. Note also that its approach was the same in 2018, but this was not made as clear in the AER's 2018 RoRI.
IPART	arithmetic	The historical MRP has been set at 6% for some time (see p51 here) and this appears to have been set in 2013, when it was clearly identified as being the arithmetic mean at the time (see p 15 here).
ESCOSA	arithmetic (apparently)	6% is used for water inquiries and has been for some time (see p155 here). This appears to have been set in 2013 where it was based on "regulatory precedent" (see p127 here and note that the guidance papers which may have shed further light on this do not appear to be available anymore. In rail, it appears that ESCOSA is required to use 6% (see p12 here)
QCA	arithmetic	See p62 here
NZCC	arithmetic	Use the "Ibbotson method" calculated by Martin Lally (see p128 here). In the paper footnoted on that page, Dr Lally makes it clear that he is using an arithmetic mean (see p25 footnote 11 here), which is consistent with his advice to the AER (see pp6-7 here).

Weightings given to the geometric and arithmetic means to correct "bias"

The ERA notes that the academic literature suggests that arithmetic means are biased upwards and geometric means are biased downwards as estimates of a "true" mean which likely lies between them (see [747] to [750]). However, as CEG point out in their expert report, this is not quite correct, rather, the literature suggests that, where the holding period involves compounding and where the investor is using an "invest and accumulate" strategy, then the arithmetic mean is biased upwards and the geometric mean return (over a return dataset that is longer than the investment period) is biased downwards in respect of the "true" mean annualised compound return over the investment period.[27] This is far narrower than a general proposition about the bias of the two estimates.

Further, in order to earn the "true" mean annualised compound return over the investment period an investor needs to expect to earn the arithmetic mean in each year. If the regulator sets a regulated return on "R%" each year and the regulated business's actual return fluctuates above and below R% (e.g., actual return=R±α) then the regulated business's compound annualised return will be below R%. CEG provide an example in their expert report which highlights the fact that, if returns are variable, and the investor is compounding, actual returns will be below the geometric mean.[28]

The above notwithstanding, if the ERA still seeks to estimate the compound annualised return on the market over a given investment horizon, the solution is not to use a 60/40 weighting of the arithmetic and geomean. We note that the Independent Panel have also suggested that the ERA has not adequately justified its choice of a 60/40 weighting.[29]

The ERA notes (see [752]) that Indro and Lee propose a formula to minimise bias. The other paper cited by the ERA (Jacquier et al 2003) also propose a formula which is very similar. In both papers, the authors are seeking the best estimate of the compound average return expected over a given investment horizon. It is unclear why the ERA would go to the trouble of finding in the literature how to best estimate the compound average return expected over a given investment horizon and then not use this information.

[27] *See CEG 2022, pp14-18.*
[28] *See CEG 2022, p8 and pp10-12.*
[29] *See Cosgrove et al 2022, p15 & p40.*

The formula from Indro and Lee (1997) is:[30]

$$E(W^N) = \frac{T-N}{T-1} R_A^N + \frac{N-1}{T-1} R_G^N$$

The formula from Jacquier et al (2003) using the same notation as above is:[31]

$$E(W^N) = \frac{T-N}{T} R_A^N + \frac{N}{T} R_G^N$$

Where the left hand side is the weighted average giving the true, unbiased mean, T is the number of historical periods forming each average, N is the number of periods one is looking forward (the investment horizon) and R_A and R_G refer to the arithmetic and geometric means respectively. Note that each paper starts with at a different formulation of the problem, but both end up at essentially the same weights. In the context of the ERA analysis, the value for N should be set consistent with the term of the risk free rate (10 years). Since the ERA uses four different time periods (T in the equations above) for its averages, this gives rise to four different weightings according to each paper. These are shown in Table 2, and have informed the MRP values we show in Table 3 below.

Table 2: Correct weights for arithmetic and geometric means

	Indro and Lee		Jacquier et al	
	arithmetic mean	*geomean*	*arithmetic mean*	*geomean*
1958 to 2022*	86%	14%	84%	16%
1980 to 2022	78%	22%	76%	24%
1988 to 2022	73%	27%	71%	29%
2000 to 2022	57%	43%	55%	45%

** We note that the ERA actually uses data to the end of 2021; we have just preserved the naming convention for its periods the ERA has used here. The weights shown cover the period ending in December 2021 in each case, so that they can produce the correct estimates of the MRP.*

Note that, only in the case of the shortest time period do the weightings approximate those used by the ERA, in all other cases, the arithmetic mean has a much higher weight. Moreover, if the investment strategy is not "buy and accumulate", that weight should be 100 percent.

Which geometric mean to use

The expert report from CEG that accompanied our May submission noted that the ERA was in fact using the wrong geometric mean; rather than estimating the MRP for each time period and then taking the geometric mean of the result, the ERA should subtract the geometric mean of risk-free returns from the geometric mean of market returns.[32] The ERA responded by positing a hypothetical investment strategy and noting that CEG had not explained why it was not possible to implement this strategy, using this as the reason for making no change (see [769]).

In the expert report attached to this submission, CEG explain why it is impossible for an investor to implement the particular investment strategy the ERA have devised.[33] In simple terms, this is because the strategy involves a borrower borrowing 100 percent of their funds at the risk-free rate and using these borrowed funds to invest in a risky asset with no collateral of their own. There is no rational lender who would agree to lending on such terms.

Additionally, CEG point out that:[34]

[30] *See Indro and Lee 1997, equation 22*
[31] *See Jacquier, et al 2003, equation 6.*
[32] *See AGIG 2022b, Appendices for the CEG expert report.*
[33] *See CEG 2022, p5*
[34] *See CEG 2022, pp6-7*

- their approach is the same as that followed in the highly-regarded Dimson Marsh and Staunton reports for Credit Suisse;
- their approach is widely supported in the academic literature, including the Indro and lee (1997) paper cited by the ERA; and
- their approach is supported by the ERA's CRG.

We suggest that, to the extent that the geomean is used at all, the ERA should use that proposed by CEG and widely used in the professional and academic literature.

Estimating the dividend growth model

In respect of the DGM, our primary concern is which DGM to use. In this respect, we believe that the ERA has not properly considered the DGM provided by Frontier, and rejection of this model is based upon incomplete and, in some cases, incorrect analysis. This is summarised in more detail in a submission from the ENA.[35] However, briefly:

- The adjustment the ERA proposes (see [794]), which is not part of Frontier's Calibrated DGM, is not supported by more recent literature.
- The notion about constant growth rates (see [795]) suggested by the ERA ignores the long run nature of the *g* parameter in thee DGM, and the fact that the ERA's DGM is subject to exactly the same criticism.
- If there is a concern about *g* in the calibrated DGM being higher than GDP growth (see [799]), Frontier explain how to address this in a more recent submission to the AER.[36]
- The concern about volatile estimates from the calibrated DGM (see [800]) ignores both the fact that the ERA's DGM produces estimates which are just as volatile, and the fact that the resultant return on equity is less volatile because of inverse relationship between the MRP and risk-free rate.
- The fact that the calibrated DGM produces different estimates depending on the time period chosen (see [801]) is actually a positive as it allows the model to be matched to the time period of concern. In any event, proper application of the model would not involve calibrating it to extremely short periods, as the ERA has done in Figure 3 of its Draft RoRI (See p133).
- The concern about transparency and replicability (see [802] to [804]) is overstated given the small additional information required.
- The suggestion that the model cannot be implemented at a time when it is above long run average returns (see [798]) is, if employed as a general principle, to prevent appropriate changes for fear of their timing. In any event, the case here is entirely unlike the change to the cost of debt in 2013 (when the ERA also considered a transition, ultimately deciding it was not necessary), because the ERA has been using a DGM since 2013, with the same pattern of "unders and overs", but just a slightly different long run growth rate. We do not believe a transition is needed for such a small change.

Against these concerns, which are relatively trivial, we note that the ERA and AER versions of the DGM make use of biased estimates of the unconditional mean, which are not consistent with the HER estimates which are used;[37] a bias the calibrated DGM was designed to avoid. For this reason, we believe it should replace the ERA's DGM.

2.3.2. Combining models

From the discussions above, there are two options for the DGM (the ERA's DGM and Frontier's), two options for the geometric mean (the ERA's and CEG's) and two different weights for the

[35] *See ENA 2022b, pp16-21 and also ENA 2022a, pp82-92*
[36] *See ENA 2022a, p91*
[37] *See ENA 2022a p84*

geometric and arithmetic means (60/40 and the Indro and Lee method; if the geomean is used at all). We provide our assessment of the hierarchy of options (most appropriate to least appropriate) in Table 3, and believe the ERA should use the best option, in the first row.

Table 3: Hierarchy of approaches to estimating the DGM and HER

	HER	DGM	MRP*
Arithmetic HER and Frontier DGM	6.750	7.609	6.9
Arithmetic HER and ERA DGM	6.750	6.900	6.8
Indro & Lee weighted HER with CEG geomean and Frontier DGM	6.332	7.609	6.6
Indro & Lee weighted HER with CEG geomean and ERA DGM	6.332	6.900	6.5
Indro & Lee weighted HER with ERA geomean and Frontier DGM	6.294	7.609	6.6
Indro & Lee weighted HER with ERA geomean and ERA DGM	6.294	6.900	6.4
Full ERA HER and Frontier DGM	6.000	7.609	6.4
ERA published MRP	6.000	6.900	6.2

**Note – the MRP is formed with a 78/22 weighting of the HER and DGM, which is what the ERA has used to combine the HER and DGM estimates in Tables 10 and 11 (respectively of the Draft RoRI). We use the Indro and Lee (1997) weightings, but Jacquier et al (2003) would give essentially the same result.*

In putting together Table 3 we use the 78/22 HER/DGM weighting the ERA has used. However, it is not clear to us why the ERA has used this weighting.

The ERA suggests that it uses the HER, the DGM and conditioning variables to inform its decision (See Figure 7, p139) and that the position of the conditioning variables suggests that the MRP should be at the mid-point of its range (see [819] and [848]). That range, in turn, appears to be bounded by the HER at one end and the DGM at the other (there are described as the "information base for the ERA's exercise of discretion" – see [848] and there is no other mention of an overall range made), so 6.0 to 6.9.

This would imply an MRP of 6.45 percent, and weights of 50/50 for the HER and DGM, not 6.2 percent and a weight of 78/22. The weighting the ERA has used is roughly the same as that used in its 2018 RoRI, when the conditional variables were described as being below their average values.

We have argued that the ERA should be wary about using the conditioning variables in determining the MRP as they have only very tenuous links to the MRP.[38] Thus we are not opposed per se to conditioning variables having very little impact on the weights given to the unconditional (HER) and conditional (DGM) evidence. However, if the conditional variables are given zero weight, the ERA should explain what does lead it to give the weighting it has given and why this is the case.[39] This would greatly assist stakeholder confidence and could also be used to underpin any shift to an updating MRP, to which we now turn.

2.3.3. Updating the MRP through time

In our submission we devoted some time to explaining the lack of logic in using a forward-looking model like the DGM to form the MRP, and then fixing that value for the duration of the RoRI.[40] By design this gives an answer for the MRP at the time of each access arrangement which would be different not only to that which the ERA would give using the same evidence and its discretion given market conditions at the time of the access arrangement, but also different to the answer it would get following exactly the same method described in its RoRI.

[38] *See AGIG 2022a, pp18-21.*
[39] *We note that the Independent Panel (See Cosgrove et al 2022, p41) that the ERA should explain more clearly how the conditioning variable are being used.*
[40] *See AGIG 2022a, pp5-8 and 25-26.*

The ERA did not engage with our reasoning on this point, noting instead that ([853]):

> *After consideration of both the fixing and updating approaches, the ERA has concluded that there is no perfect method to estimate market returns and it is not possible to do this mechanically while being confident that all potential market conditions can be accommodated. Therefore, the ERA considers that regulatory discretion is needed to best estimate the market risk premium and it is necessary to fix the market risk premium over the life of the gas instrument.*

We find this disappointing for two reasons. Firstly, unlike the situation for beta, here the ERA has let the perfect become the enemy of the good. In other words, because it cannot perfectly transcribe its use of regulatory judgement into a series of formulae covering every possible permutation the market might have, the ERA proposes not to change its approach. The result is that, except where market conditions turn out to be identical to those at the time of the RORI at each access arrangement, the result will not be the best estimate of the MRP and it will not contribute to the achievement of the National Gas Objective to the greatest degree.

Secondly, as we point out in our submission, the ERA has done essentially exactly what we propose; in its 2013 Guideline.[41] The inputs it used were subtly different, but it formed an estimate weighting conditional and unconditional evidence to get and answer at the time of the Guideline, and then used the same weights of the same evidence in each subsequent decision made under that Guideline. We acknowledge that it could have deviated if it chose to, but it did not do so. We do not understand why the ERA cannot make use of the same approach again just because the RoRI is binding, or still less why fixing the MRP is a better options.

The CRG notes that the market is subject to unforeseen changes (see [851]), which is true. However, the DGM should, under most circumstances, react to these changes in much the same way as it has done in the past; a sudden change in interest rates, for example, should cause a similar change in the DGM as it did when a similar shock happened several years ago. Only if a shock is entirely new would the DGM react markedly differently, and such shocks are unlikely to happen very often. Provided the expectations formation mechanism (so the weights of conditional and unconditional information in the formation of the MRP) is correct, market shocks alone will not mean that the expected return on the market will be significantly different in light of a shock without the ERA's use of judgement about how investors are likely to respond to a shock. Certainly, whatever errors do occur with a weighted average mechanism of conditional and unconditional information set in a mechanism, they are likely to be much smaller than simply fixing the MRP.

We believe the ERA has erred by ignoring the possibility of a simple weighting of conditional and unconditional information similar to that proposed by the AER in its Option 3b (see AER Draft RoRI, pp150-51), and that a method which:

- calculates the HER in the same way as the Final RORI does each December;
- calculates the Frontier DGM using data from the 2 months prior to each AA; and
- estimates the MRP as a weighted average of each using the weights determined in the Final RoRI,

will produce a superior, but not perfect, estimate of the MRP. We look forward to the ERA's further consideration of this issue in the Final RoRI.

2.4. Cross checks on the return on equity

In our submission (see pp30-32) we put forward a general proposal that cross checks should be used to check and ensure that the allowed WACC is reasonable. In particular, whether the

[41] *See AGIG 2022a, p28.*

allowed return on equity is reasonable as it must be estimated using models and regulators cannot rely on market data as they can for debt.[42]

The ERA has responded by considering three cross checks; financeability, RAB multiples and historical profitability. Moreover, it appears that the ERA is assessing cross checks in the context of mechanisms that can be applied in a formulaic manner (see [134]) and not necessarily as a guide to regulatory judgement, as exercised at the time of forming the RORI, as we suggested in our submission.[43]

Whilst we agree with the ERA in respect of its conclusions about profitability and RAB multiples and disagree in respect of financeability,[44] this is not really the point. Our main point in the submission was, and remains now that some form of checking to see that the outcome is reasonable is crucial to the integrity of the regulatory process. Otherwise, a regulator is estimating a series of input parameters in isolation, and never checking to see whether the resultant combination of inputs is sensible and will meet the objective of contributing to the achievement of the National Gas Objective to the greatest degree. This is a point we have made consistently over a long period of time.[45]

We note that, although the Independent Panel did not favour the particular cross checks examined by the ERA (se Cosgrove et al, 2022 p29), it did suggest that the ERA had very little discussion of the overall effect of the RoRI (ibid, p7) and had rather relied upon a bottom-up approach focussed on each of the parameters in its models to produce an instrument which meets its obligations under legislation (ibid p9). The Panel has queried the ERA on this and suggested, among other things, that some degree of sensitivity analysis is required (ibid p12). We agree with the Panel on these points;[46] we are not wedded to particular cross checks, but rather believe that the ERA should do something objective and transparent to show to stakeholders that its RoRI contributes to the achievement of the National Gas Objective, rather than making its own judgement that it does. Showing its impacts across a wide range of plausible scenarios is one way of doing this.

This is even more crucial when the ERA is not making a decision on the appropriate WACC for a business at the time of its access arrangement proposal, with full discretion to choose all parameters, but is rather establishing an instrument, which holds for four years and cannot be changed. In these circumstances, at the very least, regulators need to undertake proper scenario analysis which examines what the outcome of the RoRI would be if conditions over the next four years were substantially different to those at the time the RoRI is made.

The AER has responded to some degree to similar calls for more scenario testing. Whilst we do not consider that the AER has gone far enough (models should be tested to the point at which they break to find out the conditions under which they break, and the AER's scenarios do not go far enough in this context) it has at least made a start. We believe the ERA should do the same.

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[42] As the ERA notes, the CRG has also suggested the ERA use the AER's EICSI to cross check its debt estimates. We agree; the ENA and APGA's position in the AER review process has been that this metric be used as a cross check to the AER's index and there is no reason for the ERA not to use it in the same way. However, we would caution the ERA that doing so robustly is a challenging process, as evinced by the debate on this topic in the AER process, and would recommend that the ERA build on the learnings from this process if it decides to use the index as a cross check.

[43] See AGIG 2022a, pp30-32.

[44] See the ENA submission to the AER on these points, in particular the serious weaknesses of RAB multiples, (ENA 2022a, pp117-122) and note also the comparison between regulatory decisions, which we also support as a means of performing cross checks.

[45] See, for example, our return on equity proposal (available here, pp82-89) for AA4, which made use of a number of cross-checks.

[46] For the most part. We do not believe, for example, that financial models can be gamed (see Cosgrove et al p29).

2.5. Averaging periods

We deal with the ERA's approach to averaging periods for both debt and equity together under this section, as our comments are relatively limited and the same issue applies to both debt and equity. As per our submission (see p10) we are broadly supportive of the ERA's proposed changes. We have only one small technical point.

The ERA proposes firstly that both the debt equity (and inflation) averaging periods must be nominated within 30 days of the relevant draft decision. The equity averaging period must then be between 6 and 2 months prior to the start of the next regulatory period (see [181]) and the debt averaging period must be between 7 and 3 months prior to the start of the next regulatory period (see [182]). In both cases, the relevant periods need to be nominated prior to them occurring.

The issue relates to the meaning of "within" and "start date of the regulatory period". The total timeframe allowed between the service provider's original proposal and a final decision is 8 months, with the possibility of an extension to 10 months.[47] If "within 30 days" means a period of 30 days after the draft decision has been made, then it is difficult to see how a debt averaging period or an equity averaging period starting the maximum amount of time before the start date of the regulatory period could be accommodated. Moreover, in the past, the ERA's decision-making process has lagged so that the time between the draft decision and the start date for the next regulatory period defined in the previous Access Arrangement has been shorter than two months.[48] In such a situation, it would be impossible to nominate any averaging period if the service provider was required to wait until the draft decision had been made.

This is not a particularly difficult situation to remedy; replacing the word "within" with the words "prior to" would probably be sufficient.[49] We note that the wording in the Explanatory Statement is repeated in the Draft RoRI itself (see [29] and [30]). Since the instrument is binding, the ERA may risk creating a situation where a choice of an averaging period is impossible, which calls for greater clarity in wording.

[47] *See the ERA's 2022 Gas Access Arrangement Guideline, available here, p61.*
[48] *For example, DBP's 2016 to 2021 regulatory period had a start date of 1 January 2016, but the ERA's Draft Decision was issued on December 22 2015.*
[49] *This would still require the ERA to give notice of when a draft decision was coming, otherwise networks might choose an averaging period which misses the timing of the draft decision if that timing is unclear when the averaging period is chosen.*

3. Cost of debt and gearing

In this section, we comment briefly on the ERA's approach to the cost of debt.

3.1. Cost of debt and the ERA's revised bond yield approach

There seems to be widespread acceptance amongst stakeholders of the ERA's approach to debt which:

- Uses the five-year swap rate at the time of an AA.
- Adds to this an allowance for hedging and swapping costs, associated with a ten year debt instrument, which the ERA notes is the efficient tenor at issuance for debt.
- Uses the ERA's revised bond yield approach to estimate the debt risk premium for BBB+ debt and adds this to the swap rate and hedging/swap costs.[50]

We agree that the AER's EICSI should play no greater role than as a cross check (see [382]) which is similar to the role envisaged for it by the AER. However, we note that the ERA may face challenges in doing so, since the mechanism is more complex than it appears, and the ERA cannot see the source data.

There was some discussion about the impacts of foreign parental ownership in submissions from the CRG and South 32,[51] but we consider that the ERA's assessment (see [412] to [418]) has dealt with this adequately. We do not believe that a foreign-owned benchmark is suitable for the Australian regulatory context.

One very minor point is in relation to Equations 4 and 5 (pp54 and 55), which appear to contain a typographical error. We have corresponded on this point with the ERA and confirmed that the ERA plans to use the following formula for Equation 5, which appears appropriate:

$$\Delta RoD_t = \frac{D}{(D+E)} \times \Delta DRP_t \times RAB_{Op,t}$$

Where

ΔRoD_t	is the change in the allowance for the return on debt in year t;
$\frac{D}{(D+E)}$	is the gearing;
ΔDRP_t	is the change in debt risk premium (the trailing average DRP) in year t defined as: $(DRP_t - DRP_{t-1})$
$RAB_{Op,t}$	is the opening regulated asset base in year t; and
t	is the regulatory year, ranging from year 2 to 5

A second very minor point relates to the ERA's contingencies (see Table 9 p84) where it cannot use its revised bond yield approach, it will use what is essentially the AER's index approach, with the exception that it will take data from only the RBA and Bloomberg, and not Thompson Reuters. It has provided no reason for this deviation from its practice in 2018.[52] We note it is likely to be

[50] *We note that the Independent Panel (see Cosgrove et al 2022, p36) has suggested that the ERA examine its minimum tenor for bond inclusion and the weighting to be applied to each model. There may be merit in these suggestions, but we have had insufficient time to explore the issue properly.*

[51] *See ERA CRG, 2022b, Consumer Reference Group Submission on ERA 2022 Gas Rate of Return Instrument Review Discussion Paper of December 2021, February 2022, available here, p49 and South 32 letter to the ERA dated 12 Feb 2022, available here, p2*

[52] *See ERA, 2018, Appendix 6: DRP process for updating in Excel, available here, p41.*

of limited consequence, as it is only a contingency, but it would be useful for the ERA to explain its objection to the use of the Thompson Reuters curve.

More substantively, contingency B (divergence of estimates) suggest the ERA will use the AER's index approach when the deviation between the three estimates is greater than 100 bps. In principle, deviating when estimates diverge is sound, but the ERA uses three different yield curves, and the Nelson Siegel Svensson can be highly sensitive to small changes in parameters. We would thus suggest it more prudent for the ERA to maintain its own approach if two of the three yield curves remain very close to each other (say within 25 bps), even if one of them diverges significantly.

3.2. Debt raising costs

The ERA has increased its debt raising and hedging costs from 10 and 11.4 bps to 16.5 and 12.3 bps respectively. Whilst this movement is positive, and moves towards a better reflection of the efficient costs of debt raising and hedging, there are three areas where the ERA's conclusions are not supported by reasoning:

- In respect of the size of the debt issuances used to determine the debt raising cost allowances, and in response to AGIG and GGT who said that the benchmark being used was much larger than any business being regulated, the ERA responds (see [1143]) that there is no clear relationship between the size of issuance and the debt-raising cost. However, it provides no evidence for this position. Given that many fees are fixed, it is difficult to see how size could not be an issue in pricing and the onus is arguably on the ERA to show a lack of relationship. A simpler approach would be to simply use a debt issuance which does reflect the businesses it regulates. We take the ERA's point that incentive regulation does not look to actual costs, but it does not follow from this that it ought to estimate debt costs based on an asset twice as large as the biggest business it regulates.
- In respect of liquidity costs (see [1181]), the ERA notes that it is possible that these might be indirect costs unrelated to credit ratings. However, possibility is insufficient; the ERA should ask Chairmont whether they are indirect costs which should not be compensated, and not regulated based on something which may be true. Further, the ERA suggests (see [1182]) that the relevant costs would be included in regulatory cashflows or in the working capital allowance. However, it makes no attempt to ascertain whether this is the case.
- In respect of the three-month refinancing fee, the ERA concludes (see [1184) that it is not an efficient cost because the benchmark strategy inherently minimises financing costs, and there are other mechanisms which can be used to manage refinancing risk. In the first instance, the ERA is correct that the benchmark financing strategy minimises risk, but part of that strategy is refinancing before debt is due and not waiting until the day of expiry; this is why it is required by credit rating agencies. In the second, the ERA gives no indication of how these other mechanisms deal with the particular risks associated with not arranging refinancing early. For example, it is not clear how splitting the overall debt into ten tranches deals with risks associated with not refinancing a given tranche until the final day, nor what having a 20-day averaging period has to do with this risk.

The overall costs associated with these three issues are likely to be relatively small; CEG for ATCO estimate 11 to 13 bps (see [1185]), and the ERA may ultimately conclude not to allow the relevant costs as part of the cost of debt allowance. However, it is important that each component is clearly and transparently reasoned, and this does not appear to be the case here.

In respect of liquidity costs and the three-month refinancing fee, we note that the Independent Panel suggests that it is unclear whether these are part of debt-raising costs per se or part of the

costs associated with maintaining a BBB+ credit rating. Whilst it supports the ERA's decision not to include them in debt raising costs, it suggests that the ERA explore the matter further to ensure that the costs are accommodated, for example in regulatory cashflows or working capital allowances.[53]

3.3. Gearing

AGIG agrees with the ERA's determination of a market gearing of 55 percent, which appears to be consistent with market evidence. The CRG suggested that the ERA ought to consider the actual gearing of firms, noting that it understood that one gas pipeline had a gearing level of 70 percent (CRG p45). The ERA responds, rightly, that it does not and should not consider the gearing level of individual firms (see [232] to [234]). However, we think that the CRG was making a different suggestion; that, because it understood that one pipeline had a gearing level of 70%, the ERA should investigate further. We agree with the ERA's concern that the CRG provided no further information about the origin of this "understanding" (see [531]), and suggest that unsubstantiated "understandings" should not form the basis of regulatory decisions. Unless the CRG is referring to the gearing level of DUET in 2012 (see Draft RoRI Table 5), it would seem that the CRG might be referring to gearing calculated based on book values (see AER Draft RoRI Table 4.2). If this is the case, we agree with the ERA's view (see [222]) that the market value basis for gearing is the most appropriate form to use.

In respect of hybrid instruments, the ERA's approach to remove those which have primarily equity characteristics (see [2556]) based on publicly-available information is acceptable. However, noting the difficulty associated with understanding the nature of Ausnet's recent hybrid instruments (see [247]), we believe the ERA should adopt a perspective that the instruments are treated as equity (and removed) unless there is clear, publicly available evidence to the contrary. This would avoid the risk of false-positives. As a final point, it may also be useful to understand *why* regulated businesses are issuing complex hybrid instruments, and whether this has any connection to allowed rates of return being less than the required return in the market for either simple debt or equity, and thus requiring a more complex instrument in order to maintain credit ratings.

As a final point, we not the ERA's concern ([263]) that there will be only one live firm in the market by 2026. We note the Independent Panel's view that the number of firms have declined over time and that this may become an issue in 2026.[54] Whilst credit ratings and gearing are relatively stable over time (notwithstanding the drop in credit rating shown in Table 7 of the ERA's Draft RoRI) we also believe this will be an issue to be considered in 2026.

[53] *See Cosgrove et al 2022, p47.*
[54] *See Cosgrove et al p35.*

4. Inflation and gamma

The final two topics can be dealt with relatively simply, as we have no major objections to either.

4.1. Inflation

The ERA has long used the Fischer equation and five year indexed and nominal government bonds in order to estimate inflation. We have supported this approach in the past, and continue to do so. It is widely supported by other stakeholders, and we understand that GGT, which proposed using the same approach as the AER uses in a previous submission, now prefers the ERA approach. In particular:

- We agree with the ERA that the ERA's method is able to deliver more timely forecasts of inflation than one based on RAB forecasts which are only updated quarterly (see [1249]).
- We agree with the ERA that a five year term for inflation is appropriate because it matches what is taken out with what is expected to be put back in (see [1265]). We note that this is unrelated to the term of the risk-free rate for equity or debt. This appears to have confused the Independent Panel, who are perhaps unfamiliar with the way regulatory models operate and treat inflation, for it has suggested an inconsistency between inflation and equity based upon tenor.[55] This is not the case, as the two parts of the RoRI are performing different roles,[56] but perhaps suggests more explanation of this issue from the ERA is warranted.

4.2. Gamma

We do not have any specific comments on gamma. We note the Independent Panel's suggestion that the ERA examine whether or not the benchmark efficient entity is an ASX 50 firm.[57] We note that a similar issue was raised in the AER's 2018 RoRI process in respect of the similarity between the benchmark efficient entity and Lally's work, and this may assist the ERA in its investigations on this point.[58]

[55] *See Cosgrove et al 2022, p49.*
[56] *See ENA 2022a, pp41-43*
[57] *See Cosgrove et al, 2022, p50.*
[58] *See ENA, 2018, AER Review of the Rate of Return Guideline: Response to Draft Guideline, September 2018, available here, pp145-9.*