**Australian Gas Infrastructure Group**

# AGIG Submission

ERA Rate of Return
Instrument Discussion
Paper – December 2025

## Contents

# 1 Introduction

In this submission, we provide AGIG's response to the ERA's Rate of Return Instrument (RoRI) Discussion Paper of 23 October. In Section 2, we provide our answers to the ERA's questions and in Section 3 we address additional issues not covered in the ERA's paper. Briefly:

- We can see merit in the ERA's proposal to move to a full trailing average for the cost of debt, but the detail, particularly in respect of the transition mechanism, will require further consultation. We look forward to discussing the details of this proposal as the RoRI consultation proceeds.
- We consider that maintaining a domestic sample for gearing remains fit for purpose, and that 55 percent is an acceptable benchmark for gearing. We also agree with the ERA's proposal to remove DUET from the dataset as it has been 10 years since it produced any live data and we accept the ERA's proposal to retain a BBB+ credit rating for debt.
- We agree with the ERA's proposal for simplifying the estimation of beta using its international sample set. Our analysis of the data suggests that keeping a beta of 0.7 remains prudent and is in line with comparable regulators.
- We do not consider that changing the long run growth rate in the ERA's dividend growth model is appropriate at this point in time, given the weight of evidence.
- In respect of the market risk premium, we raise two additional issues:
  - We do not consider that the geometric mean should play a role in determining the market risk premium but, if it does, then the weight the ERA gives it is not in keeping with the evidence it has on what is an appropriate weight.
  - The way the ERA uses the conditional and unconditional means for determining the market risk premium and then fixes that market risk premium for four years is not a logically consistent approach to the evidence. We outline two approaches which are logically consistent.
- We raise a few minor issues in respect of the choice of averaging periods, from our experience with the implementation of the 2022 RoRI, where more clarity in the RoRI itself could avoid confusion and add flexibility.

Our response to the Discussion Paper is relatively brief and in many cases we present preliminary views. This is a matter of timing. Whilst we appreciate that some issues in respect of rate of return may be relatively settled, and the ERA may wish to focus on a subset of issues, the allowed time, even with the extension, is too short for stakeholders to deal fulsomely with the issues. We suggest that further opportunities for further feedback be provided between now and mid 2026 when the Draft RoRI is released.

As a final point, in [11] of the Discussion Paper, the ERA notes that this RoRI will apply to the next Access Arrangement (AA) Decisions of all three gas networks regulated by the ERA. It is not clear whether this will happen; effectively, if the ERA makes a decision for our AA7 prior to December 17, 2030, then this forthcoming RoRI will apply, but if it delays its final decision past that date, the

subsequent RoRI will apply.  If this forthcoming RoRI applies to our AA7, we note that it will be roughly 9 years out of date by the time of the last year of AA7 where the ERA holds parameters fixed which vary in practice and so, in deciding whether to fix a parameter, the ERA should look nine, not four years ahead to ascertain whether doing so is appropriate.

## 2 ERA Questions

In this section, we provide answers to each of the ERA's questions from the Discussion Paper.

1. *Has the 2022 gas instrument supported the effective mechanical calculations of the rate of return required for access arrangement and tariff variation processes?*

Yes, we have not experienced any significant concerns in updating the cost of debt each year.

2. *How has the 2022 gas instrument performed in reflecting changing financial market conditions? Are there any areas of concern that the recent volatility of financial markets has presented?*

In the 2022 review, the Independent Panel suggested that the ERA assess the performance of each previous RoRI to understand whether it represented an appropriate starting point for subsequent reviews (See Explanatory Statement p31).

The ERA's assessment of the performance of the 2022 RoRI in the Discussion Paper gives little consideration to actual performance of the 2022 RoRI. On p15 of the Discussion Paper, the ERA notes that:

- The 2022 instrument is responsive to market conditions as rates of return change when risk-free rates change, which the ERA suggests is "reflective of the prevailing market for funds".
- The rates of return are correlated and consistent amongst the three regulated firms; and
- Each of the pipelines experienced large price increases driven by the large change in market conditions.

The Discussion Paper then goes on to compare (both in a table on p16 and a figure containing the same information on p16) where allowed rates of return sat within the "sensitivity analysis" done as part of the 2022 Instrument.

The problem with this analysis is that it relates solely to the movement of government bond rates rather than focusing on whether the level of return allowed was sufficient to support efficient investment. The 2022 RoRI provides a fixed markup over the risk-free rate for debt and a different one for equity.[1] The conclusions the ERA draws in the Discussion Paper would be the same regardless of the size of these mark-ups. For example, even if equity had a 50-percentage point margin over the risk-free rate and debt had a 40-percentage point uplift:

- The movement of allowed rates of return relative to the government bond rate would be the same.
- Rates of return between the regulated firms would have been correlated in exactly the same way as the ERA found.

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[1] *The debt risk premium does change through an AA period, but this makes only a small difference in the allowed rate of return.*

- There would have been a material increase in allowed rates of return, leading to large price increases.
- The allowed rates of return would still have fallen in the middle of the band in the sensitivity analysis undertaken in the 2022 RoRI.

This does not represent an adequate assessment of whether returns were appropriate as the ERA's methodology is unable to distinguish between any arbitrary mark-up over the risk risk-free rate, but rather represents little more than an illustration of how risk-free rates have moved over the past four years. We do not believe this is the kind of assessment that the Independent Panel had in mind in 2022; most particularly where the 2026 RoRI builds upon the 2022 RoRI.

A more meaningful assessment would consider evidence linked to investment behaviour. One way in which the ERA could do this is to consider the amount of discretionary investment undertaken by gas businesses during the period of time governed by the RoRI compared to previous periods. For the DBNGP, this would be provide limited information, as almost all of our investment in recent years has involved replacement capex rather than discretionary spending, as pipeline capacity has been sufficient to meet demand. Looking ahead, however, there may be a need for pipeline expansion, depending upon how the retirement of coal and rise of renewables progresses. The last expansion of the DBNGP, commncing in 2005, was negotiated outside the AA framework, largely because the regulatory allowed rate of return (considerably higher than the 2022 RoRI) was considered insufficient for the risks involved by the then owners. If a similar pattern emerges under the 2026 RoRI, it would be highly relevant for any future evaluation.

Another approach would be to compare how attractive investment in the WA gas sector is relative to comparable regulatory regimes internationally. The ENA's submission to the AER's RoRI process provides an example of such benchmarking, which we replicate in Figure 1. It compares the allowed return on equity amongst a number of different regulators from around the world. The ERA is coloured grey, the AER is light blue, each individual Europe and New Zealand regulator is a darker shade of blue, and the average across all US and Canadian regulators is shown in green; to differentiate these from single country estimates and highlight different source data. Note that, with the exception of Canada,[2] all estimates have been made with betas re-levered to reflect a 55 percent gearing to ensure a like-with-like comparison with the way the ERA calculates beta. This is why the AER allowance in particular, appears a little lower than the headline number provided by the AER.

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[2] The Canadian source did not contain enough information to re-lever betas. The average leverage in the Canadian data was 60 percent, rather than 55 percent.

Figure 1: ERA allowed rate of return compared with other regulators
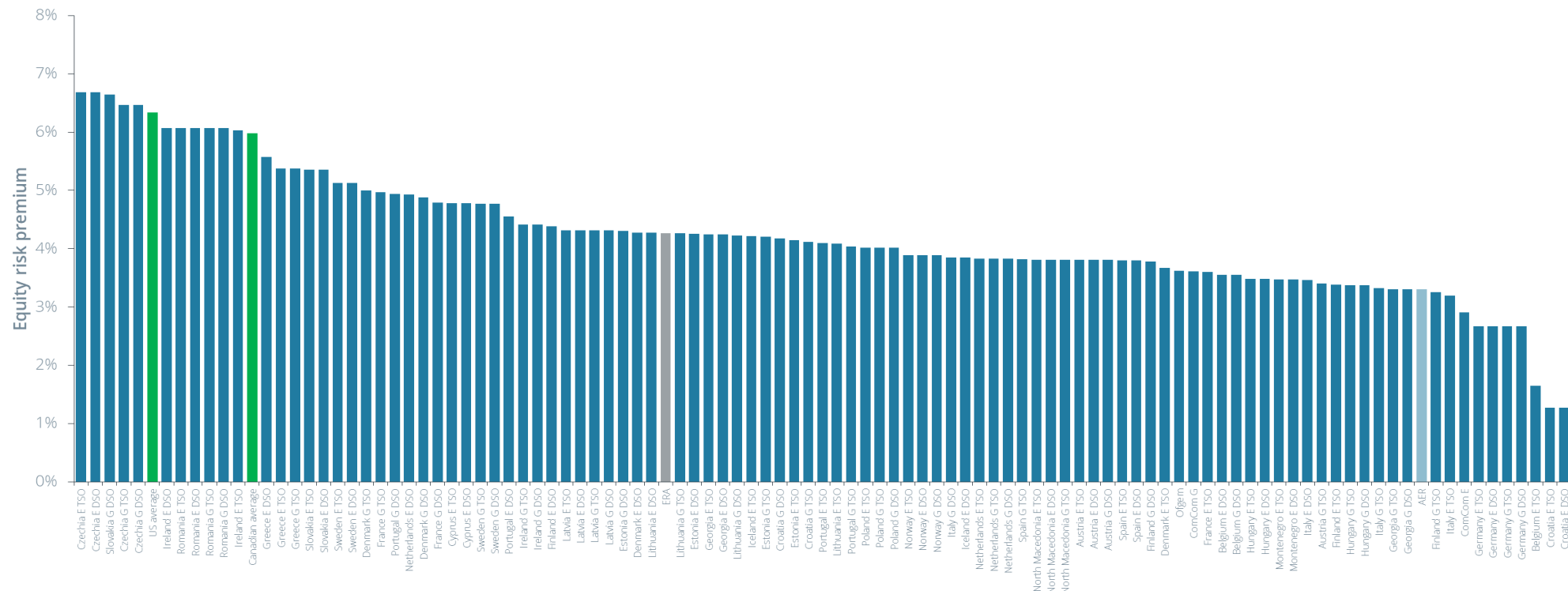


*Source: ENA submission to the AER discussion paper, forthcoming.  Note that, at the time of our submission, the ENA evidence considered just European and New Zealand regulators.  The average across US regulators was derived from a report (available here) presented to OfGEM which was fortuitously calculated with a gearing of 55 percent, but used a 20-year risk-free rate (as used in the UK), so we adjusted this to reflect the average different between 20 and 10 year government bond rates in the US (around 30 bps in the years concerned, available here).  The Canadian data is available here.  It shows average total returns on equity and gives a range for the relevant 10-year risk-free rates in the year concerned.  We have used the upper end of the range.*

The ERA's allowance sits almost exactly at the average of European regulators, is roughly 200 basis points lower than allowances available in North America, and 100 basis points higher than allowances available on the East Coast of Australia or in New Zealand. One might conclude that this helps make regulated gas assets in Western Australia more attractive to investors than elsewhere in Australia, about as attractive as European gas assets, but much less attractive than North American gas assets. However, that statement needs to be tempered with the caveat that each market has different risk premia, and Australia's market risk premium is higher than many of the other comparators in the sample set, which may mean that international investors require a higher premium to enter the Australian market in the first instance, before they consider which sector to invest in.

There may be other measures; for example, the ENA presents evidence to the AER Discussion Paper about the financeability of regulatory decisions (applied to the regulatory model for the benchmark firm, not actual operations) based on the AER's financeability criteria. The ERA could evaluate its decisions using the same method.

The key point is that it is incumbent upon the ERA to apply a high evidentiary standard to the evaluation of its own framework and not simply ask stakeholders for their views. The Discussion Paper does not engage with the Independent Panel's 2022 critique on this point and does not apply the level of scrutiny required to support continuation of the 2022 RoRI as the foundation for 2026.

3. *Do you support the ERA's proposed approach for the domestic sample (retain the use of APA, Spark Infrastructure Group and Ausnet Services, remove the DUET Group)?*

Yes, this is an appropriate step. Particularly in the AER process the ENA have consistently argued against the retaining of firms that have long since delisted.[3] Not only are betas not constant through time (as evidenced by the different results the ERA itself gets between 2022 and today), but the composition of the relevant markets also evolves, rendering the past a "different country" which is not necessarily relevant from the perspective of forward-looking risks. The ENA submission to the AER process covers this issue in more detail and largely serves to confirm the ERA's approach in respect of DUET.

Looking forward, it would be useful if the ERA indicated a point of principle for the 2030 RoRI. By that time, Spark and Ausnet will have been delisted for roughly as long as DUET has been today. For regulatory consistency, the ERA should indicate whether it intends to remove firms after a defined period or whether it will revisit the composition of the sample at each RoRI.

4. *Do you support the ERA's continued consideration of select international firms? Are there any new international firms that may be appropriate to now include?*

Yes, the selection of international firms used in estimating beta remains fit for purpose.

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[3] *See, for example, ENA, 2022, Response to AER's Draft Instrument and Explanatory Statement, 2 September 2022, pp108-9, available* here.

In addition to which international firms to include, and the filters used by the ERA, there is also the question of how the information will be used. We consider this in our response to Question 14.

### 5. Is gearing sufficiently stable to maintain the 55 per cent gearing ratio?

The evidence on gearing is somewhat inconclusive. Every year, the AER publishes its *Rate of Return Annual Update*. In Table 1, we provide the annual, 5 yearly and 10-yearly averages of gearing from the data in that publication.

*Table 1:        Regulated Energy Gearing 2006-2024[4]*

|  | ENV | APA | DUE | AST | SKI | Annual avg (no DUET) | 5yr avg (no DUET) | 10 year avg (no DUET) |
|---|---|---|---|---|---|---|---|---|
| 2006 | 66 | 51 | 79 | 56 | 60 | 58 |  |  |
| 2007 | 65 | 59 | 67 | 55 | 57 | 59 |  |  |
| 2008 | 77 | 73 | 76 | 59 | 70 | 70 |  |  |
| 2009 | 75 | 68 | 80 | 70 | 70 | 71 |  |  |
| 2010 | 74 | 61 | 80 | 64 | 65 | 66 | 65 |  |
| 2011 | 66 | 53 | 79 | 64 | 62 | 61 | 65 |  |
| 2012 | 63 | 47 | 72 | 59 | 59 | 57 | 65 |  |
| 2013 | 53 | 46 | 71 | 57 | 62 | 55 | 62 |  |
| 2014 | 47 | 45 | 64 | 58 | 55 | 51 | 58 |  |
| 2015 |  | 50 | 62 | 59 | 56 | 55 | 56 | 60 |
| 2016 |  | 49 | 51 | 54 | 54 | 52 | 54 | 60 |
| 2017 |  | 49 |  | 50 | 52 | 50 | 53 | 59 |
| 2018 |  | 45 |  | 53 | 57 | 52 | 52 | 58 |
| 2019 |  | 45 |  | 53 | 59 | 52 | 52 | 56 |
| 2020 |  | 45 |  | 57 | 59 | 54 | 52 | 54 |
| 2021 |  | 49 |  | 49 | 58 | 52 | 52 | 53 |
| 2022 |  | 45 |  | 44 |  | 45 | 51 | 52 |
| 2023 |  | 50 |  |  |  | 50 | 51 | 52 |
| 2024 |  | 56 |  |  |  | 56 | 51 | 52 |
| 2025 |  | 57 |  |  |  |  |  |  |

*Source AER 2025, Rate of Return Annual Update 2025, available here, pp7-8.*

The annual averages are variable, but both the five- and ten-year averages appear to have been on a decline until 2022 when the one remaining firm's gearing started an upward cycle again.

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[4] *See AER 2024, Rate of Return Annual Update, December 2024, p7, available here. We note that gearing levels based on book values are higher (p8 of the same publication), but that the ERA uses market-value based gearing (see 2022 RoRI Explanatory Statement [262])*

On the basis of averages, a case could be made for a reduction in gearing, but this would reflect firms which are no longer live, and we have no data on how their gearing may have moved in more recent years.  On the basis of the one remaining firm, a case could be made for an upward cycle.  In the face of this evidence, we consider it may be most prudent to keep gearing stable, particularly since this RoRI may apply for 9 more years, we consider this militates against further reductions in benchmark gearing from the 2022 RoRI.[5]

In Table 1 we have excluded DUET from our averages as we assumed that the ERA intended to exclude it from all aspects of the 2026 RoRI to be consistent, rather than just beta.  Including DUET makes no difference to the 2024 five- or ten-year averages.  The ten-year average including DUET is slightly higher than shown in Table 1 prior to 2023, and the five-year average is slightly higher prior to 2020.

> 6. *Do you support the continued use of domestic energy networks to estimate gearing? If not, please explain why and your alternative approach*

Yes – we do not consider that gearing is likely to be as volatile as beta and, as noted above, it may exhibit a great tendency to cycle.  For this reason, we consider that it remains appropriate to use domestic energy networks.  Our response assumes that the ERA intends to remove DUET from the gearing sample as well as from the beta sample; as noted earlier, retaining DUET would make little practical difference in any case.

As with beta; it would be useful for the ERA to indicate its intended approach for the 2030 RoRI.  That is, is there some point of principle which dictates when gearing estimates from unlisted firms becomes stale, and if so, what is it?  This would assist stakeholders in understanding what 2030 might bring.

> 7. *If an international sample is to be used for estimating gearing, which jurisdictions and companies could be considered comparable and included as part of the sample? Please explain why*

See answer for question 6.

> 8. *Is credit rating sufficiently stable to maintain BBB+ credit rating?*

Yes, we consider that, at present, it is.  However, we make two caveats.  Firstly, we note the point the ERA makes in the Discussion Paper that [125]:

> *We consider maintaining the use of a benchmark efficient entity to inform the benchmark credit rating.  We define the benchmark efficient entity as a pure-play network service provider operating within Australia without parental ownership, with a similar degree of risk as that which applies to the service provider in respect of the provision of gas network services.*

In that context, it is important to note that several Australian businesses have obtained ratings upgrades from Moody's or S&P due to their parental ownership. For example, DBPNGP Finance Co Ltd, Energy Partnership (Gas), Australian Gas

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[5] *We also note the ENA submission to the AER process, which points out that changing the benchmark gearing level in the context of a trailing average can give rise to issues.*

Networks, SGSP (Australia) Asset Pty Ltd, Ausgrid Finance P/L and Network Finance P/L have all received a one-notch credit upgrade due to their parent ownership from Moodys.[6]  If the benchmark efficient firm operates without parental ownership, then these upgrades would need to be removed.

Adjusting the ERA's 2024 data in Table 4 of the Discussion Paper for these uplifts (for example, AGN moving from A– to BBB+) still produces a BBB+ median. This may not hold in future years, and the ERA should replicate this analysis when finalising the RoRI.[7]

There remain uncertainty as to whether gas businesses are seen as carrying higher risk by investors, given their potentially greater exposure to net zero issues and asset stranding.  Whether this impacts their accessible cost of debt on a systematic basis remains unclear.[8]  For now, even after removing parental uplifts, the median rating in the ERA's sample remains BBB+.  Again, we suggest the ERA re-examine this issue before finalising the RoRI.

Finally, we note our caveat from our introduction; this forthcoming RoRI may still be in force in nine years' time if it informs our AA7 process.  The ERA may wish to consider this when it considers whether a BBB+ credit rating remains appropriate for gas businesses over this timeframe.

> 9. *Do you support the continued use of domestic energy networks to determine the benchmark credit rating? If not, please explain why and your alternative approach*

Yes. Our position mirrors our response to Question 6. Domestic firms provide the most relevant evidence and credit ratings are likely to be relatively stable through time, so the domestic sample remains appropriate.

> 10. *Do you support a change in return on debt approach to a full trailing average? If not, please provide your reasons*

We tentatively support the move to a full trailing average on the cost of debt.  This would align the ERA's approach with the method applied to our other regulated networks.  This is not to say that either the existing ERA or existing AER approach is better, just that one approach around the country would simplify our operations.

Our support is, however, conditional on the form of the trailing average and on the transition arrangements.  We address the latter in our answer to Question 11 below.

In respect of the former we note that the AER is currently contemplating a weighted trailing average approach.  The ERA has made no mention of the potential for a weighted trailing average in its Discussion Paper.  For a business whose RAB is stable or falling, the weighting approach the ENA's is putting forward in its

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[6] *See Moodys, 2025, Sector in Depth: Power – Australia, 6 Feb 2025, p20, available here.*
[7] *We set A- as 1, BBB+ as 2 and BBB as 3.  We recognise that the Moody's nomenclature is different, but the grades are roughly equivalent and we assume a one notch upgrade in Moody's schema would equal a one notch upgrade for S&P.  Note that the 2025 credit ratings in the most recent AER Rate of Return Annual Update (available here, see pp24-25) are identical to their levels in 2024.*
[8] *We note that the expert report commissioned by the AER suggests that this issue is perhaps more complex than regulators have considered in the past (summarised most simply at pp53-55 of the report, available here).*

submission to the AER Discussion Paper yields the same result as an unweighted trailing average such as that which the ERA envisages.

If, however, the DBNGP were to undergo a major expansion to meet rising gas for power generation demand, the difference between a weighted and unweighted approach would become material. No such expansion is planned for AA6, but we note that this RoRI may apply to our AA7, when, depending upon how the energy transition proceeds in WA and the speed at which coal is retired, there may be a need for significant additional capex. The ERA may wish to consider this when making this RoRI, and we welcome further discussion over the coming months, along with other issues associated with the cost of debt.

> 11. *If a full trailing average debt approach is to be implemented in the 2026 gas instrument, are transitional arrangements needed and why? Please detail what transitional arrangements may look like*

If the ERA adopts a full trailing average, it must use a transition mechanism analogous to the AER's past transition from an on-the-day approach to a trailing average. That is:

- Year 1 – 100 percent tranche 1
- Year 2 – 90/10 of tranche 1 and tranche 2
- Year 3 – 80/10/10 of tranches 1, 2 and 3.
- Year 4 – 70/10/10/10 of tranches 1,2,3 and 4; and so on

where each tranche reflects the yield on 10-year debt in the relevant year of transition.

This is because networks can only hedge the swap rate component of the cost of debt. The transition mechanism therefore must be the same regardless of whether the previous regime was a pure on-the-day approach or the ERA's current hybrid approach. Consistent with the AER's practice, transition would begin at the next AA decision after the RoRI. For us this is AA7, commencing 1 January 2031, with transition concluding in 2040.

In the Discussion Paper (p30), the ERA appears to contemplate having different forms of transition based upon how networks are actually raising debt now, with three different options presented in Table 5 of the Discussion Paper. This is inconsistent with the ERA's "benchmark efficient entity" concept. The ERA outlines the practice of the benchmark efficient entity under the 2022 RoRI in [133] of the Discussion Paper. If the ERA were now to adopt a transition tailored to actual business practices rather than to benchmark practice, it would imply that the benchmark efficient entity has not been behaving efficiently under the 2022 RoRI. Such logical contradictions are unhelpful in supporting sound regulatory practice.

If there is a transition, a key question will be a full transition of what? This comes about because the debt risk premium is already subject to a trailing average. We see two possibilities:

- Take the ten-year swap rate in the first year of the next Access Arrangement, add to it the trailing average of the debt risk premium to that

point in time to make a full cost of debt, then transition that full cost of debt forwards as per the steps outlined above.

- Treat the ten-year swap rate transition as per the dot points above and then add to this a trailing average of the debt risk premium for the given year. So, if the start year were for 2026 we would have:
  - 2026 – 2026 swap rate @ 100% weight plus debt risk premium trailing average from 2017 to 2026.
  - 2027 – 2026 swap rate @ 90 percent, 2027 swap rate @ 10 percent with the 2018 to 2027 debt risk premium trailing average added to this weighted average of the two swap rates.
  - 2028 - 2026 swap rate @ 80 percent, 2027 swap rate @ 10 percent and 2028 @ 10 percent with the 2019 to 2028 debt risk premium trailing average added to this weighted average of the three swap rates and so on.

After ten years, both approaches converge to give the same number. They differ only in that the first approach places less weight on the pre 2026 debt risk premia, because they sit inside a diminishing year-one tranche; the second keeps those DRP values in the trailing average until they naturally roll out. In our simulations, differences in outcomes are small. The second approach, however, is more complex and would require revising the instrument after ten years to allow a shift back to full-cost tranches. For these reasons, the first approach is more practical.

One final issue is the issue of hedging. The ERA suggests in the Discussion Paper [152] that the 12.3 bps it currently provides for hedging from the ten to the five year rate would no longer be needed under a full trailing average. This is the case, but hedging would still be required in order to give effect to the transition mechanisms outlined above. The hedging cost may be smaller than the current allowance and may decline through time as the debt book of the benchmark efficient entity more closely approximates a full trailing average, but it will not be zero from the outset. We welcome discussion on the quantum of this cost as the review proceeds.

### 12. To update the dividend growth model, what are the more current real GDP growth parameters?

We do not consider it prudent to make any changes to the ERA's Dividend Growth Model (DGM) at present, as the change relies on interpretation of one data source when other data sources disagree, and, arguably, misunderstand the nature of the projections in the Commonwealth Treasury's *Intergenerational Report*. In particular:

- The 2023 Intergenerational Report (IGR) presents long-term projections from a simplified model, not forecasts. It explicitly notes omissions such as the productivity effects of skilled migration: including such effects would raise projected growth.[9]

- The GDP figures in the *2023 Intergenerational Report* are simple averages of the projected growth rates over the next 40 years. Projected growth is

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[9] 2023 Intergenerational Report, p 254, available here.

higher in earlier years and lower growth rates in later years.[10]  Adopting the simple average for all years would therefore understate the DGM estimate of the required return on the market as earlier years have a disproportionately higher impact due to the time value of money.

- The lower 4.7% figure in the ERA's Discussion Paper is at odds with observed outcomes.  For example, nominal GDP growth has averaged: [11]
    o 6.01% over the last 30 years;
    o 5.83% over the last 20 years;
    o 5.30% over the last 10 years; and even
    o 6.54% over the last 5 years.

- Commonwealth Budget forecasts for nominal GDP have increased in every Budget since the 2023 IGR, and the 2025–26 Budget forecasts GDP growth of 5.50 percent in 2028–29, the highest 4th year forecast since 2009–10.[12]

These points show that it would be premature to abandon the ERA's current nominal GDP growth estimate in favour of a single projection that is neither a forecast nor aligned with recent realised or forecast data.The ERA's current estimate is consistent with observed outcomes over the last 30 years and over the last 5 years.  Moreover, no source, including the 2023 Intergenerational Report suggests that nominal GDP growth is expected to immediately decrease from the recently observed level – the most pessimistic forecast is for a gradual decline over time, implying that any revision should be considered at the next RoRI, not now.  There is also evidence that nominal GDP growth forecasts have improved since the 2023 Intergenerational Report was published.

We also question whether it would be appropriate to continue to apply the same 1% deduction irrespective of the forecast of nominal GDP growth.  It Is implausible that listing activity would remain unchanged irrespective of the rate of growth in the broader economy.

As a final point, we note in Section 3.2.2 that the way in which the DGM estimates are used by the ERA is logically problematic.  This is perhaps a more important issue than which long run forecast to use.

### 13. Do you support discontinuing the use of conditioning variables to inform the ERA's decision on the market risk premium?  Please provide reasons for your response

We expressed a view in our response to the 2022 Draft RoRI that the return on equity should be able to change with the risk free rate as, despite the uncertainty about exactly what relationship might exist between the two variables, it is clear that there is some relationship other than the return on equity being a fixed mark-up above the risk-free rate, which is what the ERA's current approach implies.  This is a more important issue than whether the conditioning variables are used or not, which we address in Section 3.2.2.  In a sense, a decision on the use of conditioning

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[10] 2023 Intergenerational Report, p 27, available here.
[11] Available here. Economic parameters tab at Row 114.
[12] Available here. Economic parameters tab at Rows 109-113.

variables is contingent upon a decision as to whether the MRP changes through the course of a RoRI.

In respect of the ERA's use of these conditioning variables in the 2022 RoRI (and previously), there are two reasons why there seems little point in their continued use for the 2026 RoRI if its 2022 approach to MRP is to be maintained.

The first of these is a principled reason. Conditioning variables indicate the state of the market when they are observed. So in principle, they could provide an indication of what the appropriate MRP is at the time of the RoRI but the conditioning variables observed at the time of the RoRI could provide no information about the state of the market at the time of any AA decision made subsequent to the RoRI. If the ERA maintains a fixed MRP, the use of conditional variables (conditioning variables or the DGM – see Section 3.2.2) to form that MRP estimate is logically inconsistent with the fixed MRP estimate itself.

There is also a practical concern: in both the 2018 and 2022 RoRIs, conditioning variables appear to have had negligible impact on the final MRP. In 2018, with historical estimates of 5.7 percent and DGM estimates of 7.6 percent, the ERA chose 6 percent, implying roughly an 84 percent weight on historical data.[13] The four conditioning variables were mostly described as being towards the lower end of their range or below average.[14] In the 2022 Draft RoRI the weight on historical data was roughly 78 percent and the ERA described the conditioning variables as being at their historical averages and therefore supporting an MRP at the midpoint of its range,[15] and in the Final RoRI the weight on historical data was 83 percent and the ERA described the conditioning variables as being around their historical averages and suggesting an MRP at the midpoint of its range.[16]

These movements in weighting appear inconsistent with movements in the conditioning variables themselves and cast doubt on whether the ERA has used conditioning variables in any substantive way. The ERA may have been relying primarily on the DGM rather than the conditioning variables

This is not to say that the conditioning variables themselves lack value. Rather, the flaw lies in the way in which they are currently used by the ERA, which is not logically consistent with the estimates being made. If the ERA plans on continuing to form its MRP estimates in the same way, it is difficult to see what role conditioning variables could usefully play.

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[13] See [1312] of the Final Explanatory Statement for the DGM estimate, [1297] for the historical estimate and [1357] for the final estimate. We have calculated the weights algebraically using the input values for the DGM and historical MRP estimates, alongside the final MRP result.

[14] See [1318] of the 2018 Final Explanatory Statement for default spreads (lower end of range), [1319] for swap spreads (lower end of range), [1321] for divided yields (around the average) and [1322] for implied volatility (at or below average).

[15] See [819] of the 2022 Draft RoRI Explanatory Statement for the ERA's overall conclusion in respect of the conditioning variables, [848] for the values of the historical average and DGM MRP estimates and [849] for the final MRP estimate. As with the 2018 estimate, we have calculated the weights on the DGM and historical average MRP algebraically based on the inputs and outputs given by the ERA.

[16] See [875] of the 2022 Final RoRI Explanatory Statement for the ERA's overall conclusion in respect of the conditioning variables, [901] for the values of the historical average and DGM MRP estimates and [902] for the final MRP estimate. As with the 2018 and 2022 Draft estimate, we have calculated the weights on the DGM and historical average MRP algebraically based on the inputs and outputs given by the ERA

*14.Do you support the ERA's suggested simplifications for the estimation of equity beta? If not, please provide your reasons and any other potential approaches that might be adopted instead for the 2026 gas instrument*

Yes. The simplifications appear to be reasonable, with two caveats. The first of these is relatively minor and relates to the M&A change outlined in [183] of the Discussion Paper. Where the ERA proposes that betas for firms involved in M&A activities should be estimated after removing observations up to two weeks prior to the "announcement date". We assume the ERA means here the date that the proposed takeover is first announced, and not the date two weeks prior to merger being concluded and the relevant firm being delisted from the stock market. If this is the case, then we do not have a concern, as this will capture the fact that a firm "in play" for a merger effectively has a floor on its price. If, however, the ERA is referring to the announcement that the merger is complete, then we would urge this to change to reflect a period two weeks prior to the announcement that a takeover offer is on the table.

The second caveat is more substantive. Moving away from the country-portfolio approach is sensible given the small number of firms in some portfolios. The issue is how the ERA will interpret the new beta evidence and how it will decide whether it should continue to use a beta of 0.7. The ERA must confront the implications of shifting methodology and sample composition, rather than treating the previously adopted beta as a presumptive anchor. This concern relates not to the data or the simplification itself, but to the conclusions the ERA draws once the new beta estimates are available.

We develop this point by reference to Table 2, which compares beta estimates from the 2022 RoRI with those in the current Discussion Paper.

*Table 2:      Beta estimates by country 2022 and 2025*

|  | Australia | US | Canada | UK | New Zealand |
|---|---|---|---|---|---|
| *5-year estimates 2022 RoRI* | | | | | |
| OLS | 0.40 | 1.03 | 0.94 | 0.92 | 0.65 |
| LAD | 0.54 | 0.74 | 0.96 | 0.77 | 0.64 |
| *10-year estimates 2022 RoRI* | | | | | |
| OLS | 0.47 | 0.95 | 0.97 | 0.93 | 0.63 |
| LAD | 0.56 | 0.74 | 0.88 | 0.81 | 0.56 |
| *5-year estimates 2025 Discussion Paper* | | | | | |
| OLS | 0.36 | 0.57 | 0.66 | 0.89 | 0.68 |
| LAD | 0.49 | 0.52 | 0.68 | 0.94 | 0.53 |
| *10-year estimates 2025 Discussion Paper* | | | | | |
| OLS | 0.50 | 0.82 | 0.87 | 0.95 | 0.67 |
| LAD | 0.59 | 0.61 | 0.84 | 0.88 | 0.58 |

*Source: 2022 RoRI Explanatory Statement Table 15, pp189-90 and 2025 Discussion Paper Table 11, p43*

The five-year OLS estimates for Australia have declined only marginally since the 2022 RoRI.  By contrast, the five-year OLS results for the US have almost halved, and for Canada, they have gone down by a third.  At the ten-year horizon the picture is different.  The Australian, UK and New Zealand estimates have risen, and taken together would indicate an increase in the ten-year beta for both OLS and LAD. The reductions in US and Canadian ten-year betas are far less pronounced than their five-year results.

Detail at the firm level can be seen in Figure 2, which tracks how individual betas in the ERA's sample set have changed since the last RoRI.  These are 5- and 10-year OLS beta estimates, drawn from the ENA submission to the AER review and re-geared to the ERA's 55 percent gearing level.[17]  The estimates are from February 2023 (just after the 2022 RoRI) and September 2025.  For clarity, the sample is split into US and non-US firms and we have identified each firm by its stock ticker and country (the UK is LN; all other countries are more intuitive).

*Figure 2:    5 and 10 year OLS beta estimates in February 2023 and September 2025*
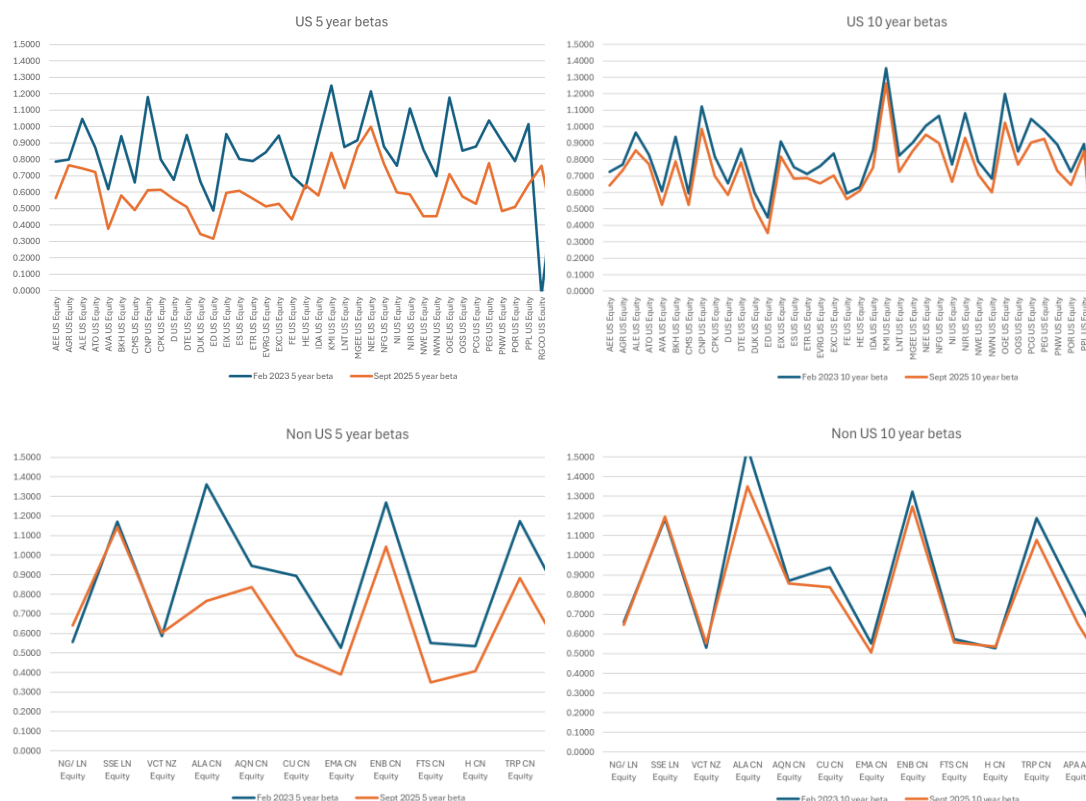


*Source: ENA data underpinning ENA submission to AER 2026 RoRI discussion paper.*

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[17] *Given that the ERA proposes changing its approach, it would have been helpful if the ERA had published what beta estimates would be under its proposed new approach, comparing these with what they would have been under its proposed new approach back in 2022 in its Discussion Paper, to aid stakeholders in understanding changes. Lacking this information, we have used data provided by the ENA in our analysis.*

Both the five- and ten-year estimates have fallen, but the ten-year estimates have only fallen a little, whereas the fall in 5-year estimates is more substantial. Note also that the US beta estimates for almost every company have fallen (the drop in Table 2 above for the US is not due to a handful of outliers) and the same is true for Canadian firms, identifiable by their ticker in the bottom left hand graph in Figure 2.

In interpreting this information, it is important not to assume that falling five- and ten-year estimates necessarily imply that the ERA's beta of 0.7 should fall. The ERA's 2022 estimate was produced using a different method. In the 2022 RoRI, the ERA took an average of country portfolios, which meant that the smaller Australia, New Zealand betas (both of which with relatively small beta estimates) and the UK (with higher beta estimates) had an outsize weight. If the ERA had estimated beta in 2022 in the manner it now proposes, giving each firm equal weight, its 5-year OLS estimate in 2022 would have been 0.82 and its 10-year estimate 0.8. By September 2025, those estimates have fallen to 0.59 and 0.73 respectively; due largely to falls in US (and to a lesser extent, Canadian) beta estimates. This should inform any consideration of moving downwards from 0.7.

We note in 2022, the ERA used information from both 5 and 10-year beta estimates. This is likely to produce more stability in beta estimates, because 10-year beta estimates, by construction, change less markedly from one year to the next as they add only $1/10^{th}$ of new information to the mix, rather than $1/5^{th}$. We would suggest that the ERA should continue to make use of ten-year estimates in 2026 to make use of this relative stability. If US 5-year betas were to switch back to levels more commonly seen in 2022 (and previously), and the ERA decided to place all or significant weight on five-year beta estimates in the 2026 RoRIs, then, by the time of the 2030 RoRI (or, possibly, by the end of 2026; shorter betas can change relatively rapidly) beta may move substantially upwards, and this volatility may not be in the long term interests of consumers.[18]

When considered together, the five- and ten-year evidence – after accounting for the ERA's methodological shift – provides only limited support for departing from 0.7. The primary downward pressure arises from unusually low US five-year betas. For this reason, we maintain that 0.7 remains fit for purpose.

In the 2022 RoRI (see Explanatory Statement Figure 16 p191) the ERA compared its results against other regulators. We do the same in Figure 3 below, for a wider sample set. It also suggests that a beta estimate of 0.7 (with 55% gearing) still sits towards the lower end of decisions made by regulators internationally, and that further reductions would shift the ERA further towards the bottom of the sample.

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[18] *We note further that, if our AA7 AA was determined on the basis of the 2026 RoRI, the beta being used then could be significantly different from a beta calculated for the 2030 RoRI at almost exactly the same time and using information far more relevant for AA7 than the information which informs the beta estimates in the 2026 RoRI. Given that beta is a forward-looking concept, if the two beta estimates were very different, it is not clear whether the 2026 RoRI could be said to be providing an efficient cost of capital for AA7.*
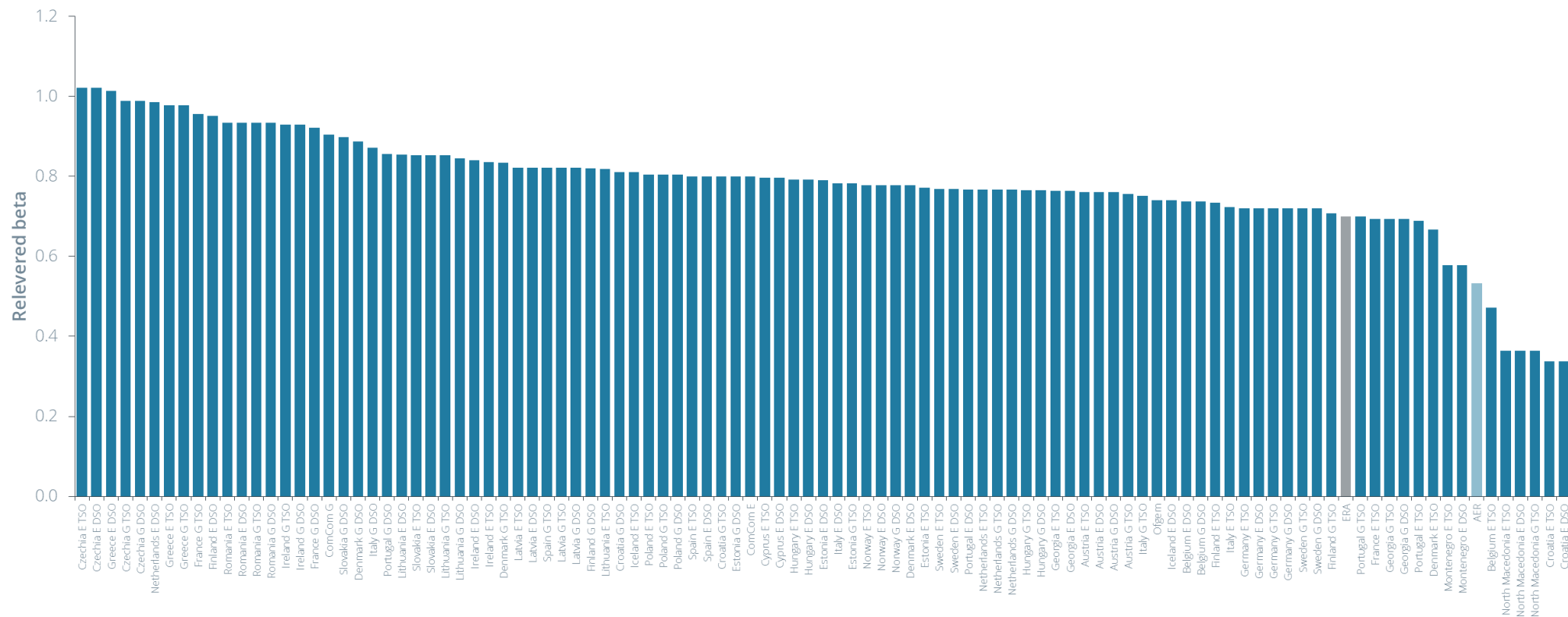
*Source: ENA submission to AER Discussion paper, forthcoming.*

As a final point, we note that, in the AER process, there has been some discussion about the impact on different estimates of beta of particular events, such as Covid. This is discussed in much more detail in the ENA submission to the AER's RoRI process, and we refer the ERA to the detail of that submission when it is published. The key concern here is that relatively rare and extreme events can be highly important in asset pricing.[19]  For this reason, attempts to excise events that a regulator or analyst considers unlikely to ever occur again are likely to remove information which is highly informative to investors when they form their estimates of expected stock returns.  The ERA has not suggested that any particular events be removed from the dataset, in this or in previous RORIs.  However, we note that LAD estimates may be subject to the same issue, when applied to each firm individually. This does not mean that LAD estimates should not be used, but rather that LAD estimates should be considered in the light of the potential informativeness of extreme events.

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[19] See, for example, Kelly, B and Jiang, H 2014, "Tail Risk and Asset Prices", Review of Financial Studies, 27(10), 2841-71, available here.

# 3 Additional issues

In this section, we provide detail on additional issues not included in the ERA's Discussion Paper being averaging periods, the use of arithmetic and geometric means and the logic underpinning the ERA's use of a static MRP, given the information it uses to form that estimate.

## 3.1. Averaging periods

In its 2022 RoRI ERA required that (Explanatory Statement p43, 2022 RoRI p5):

*An averaging period must be nominated prior to 30 business days following the release of an access arrangement draft decision*

This has proven ambiguous in practice. We note that the use of the words "prior to" were part of our submission on the Draft Rori (p16, available here). However, the practical application of this approach has produced an issue in our DBNGP process. We had interpreted the clause as meaning that, provided we made a nomination prior to the date which is 30 days following the Draft Decision, then this would meet the requirements of this clause. This interpretation is not affected by a Draft Decision being delayed. So, for example, if a Draft Decision is due on August 1, and we nominate a period starting July 6 (on some prior date, say on March 7), it does not matter if the Draft Decision is delayed until September 5, because our nominated averaging period would still occur prior to the closing of the 30-day window.

However, the ERA adopted a different view, deciding that the nomination could not be approved until the Draft Decision had been released.[20] This is problematic, in respect of timing, because the averaging period must still be between 2 and 6 months prior to the start of the relevant regulatory year (so between July and October) for the risk-free rates and inflation estimates and between 3 and 7 months (so between June and September) for the debt risk premium. Therefore, if a Draft Decision was not published until early September, we would only really have the option of October (as we must nominate prior to the averaging period starting) for our averaging period for the market parameters. This would mean that our averaging period, which is supposed to be confidential, could be ascertained by other market players who have read the requirements of the RoRI. If the Draft Decision was not published until October, we would not be able to nominate an averaging period.

We can see three solutions to this issue, either:

- The ERA stipulates that the averaging period must end 30 days prior to the *scheduled* Draft Decision; or
- The ERA removes this clause from the RoRI, which means that only the 6- 2 and 3 -7 month windows would drive the choice of averaging period; or

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[20] That is, we could write the ERA a letter proposing a time period, but the ERA would not allow that period to be chosen until the Draft Decision was made.

- The ERA makes it clear that the nomination must happen in the 30-day window following a Draft Decision, but removes the requirements requiring averaging periods falling within a certain window prior to the start of a relevant regulatory year, and ties the timing instead to the timing of the Draft Decision.

The first two options provide materially greater certainty for networks, avoiding the need to negotiate with banks and other counterparties in haste, following a Draft Decision that cannot necessarily be predicted with any certainty.  We note that this would make it harder to guarantee that the averaging period is close to the Final Decision in practice this risk is already mitigated; when Final Decisions have been late, the ERA has kept the tariffs from the previous AA current until the Final Decision, and then conducted a wash-up of under or over recovery of revenue, back-dated to the start of the relevant regulatory year, meaning that the price that shippers pay during the AA as a whole still reflects the price at the scheduled start of the AA.[21]

### 3.2. Equity – Market risk premium

In respect of the return on equity, there are two issues we wish to comment on that were not raised in the discussion paper:
- The use of arithmetic vs geometric means; and
- The use of a fixed market risk premium

These are both issues we raised in respect of the 2022 RoRI.  We consider there remain major flaws, which we now address.

#### 3.2.1. Arithmetic and geometric means

The ERA's reasoning in respect of the weights to be placed on the arithmetic and geometric means is difficult to follow.  Part of the issue may well be the main evidence the ERA appears to rely upon, being a consultant report from Pink Lake and an uncited academic article by Kaserer (2022) upon which the Pink Lake report is largely based and from which it draws its simulations.[22]

Both of these papers undertake simulations using data unrelated to the Australian market, under assumptions such as strong negative serial correlation which has not been established to exist in Australia and seek to minimise the mean squared error for forecasts against realisations (in the papers, simulated realisations, not actual data) of future compound returns.

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[21] *As a separate issue, it is somewhat illogical to have a price set on market rates of March, say, which is then back-dated to form a tariff to apply from 1 January.  In effect, shippers are paying a tariff that cannot be said to be reflective of market conditions at the start of the AA period as the market rates which give rise to said currency are from three months into the future of the start of the AA period.*

[22] *Pink Lake 2022, Evaluating the Market Risk Premium: Statistical properties of the historic market risk premium, Report to the ERA on the 2022 Draft RoRI, November 2022, available here, and See Kaserer, C, 2022, "Estimating the Market Risk Premium for Valuations: Arithmetic or geometric mean or something in between?", Journal of Business Economics, 92, 1373-1415, available here.  We note that this paper has one unique citation on Google Scholar (in what appears to be a Spanish Masters thesis, also translated into English) and no citations on its journal home-page.*

By contrast, the ERA's task is to estimate expected returns (2022 RoRI Explanatory Statement [800]) which fundamentally differ from realized returns,[23] and to form unbiased estimates (ibid [793]; as distinct from estimates which minimize mean squared error) of a market risk premium which informs a single period return on equity estimate which is not compounded in a regulatory model. There are significant differences between what the two papers are doing and what the ERA needs in terms of forming an MRP estimate, making its reasoning difficult to follow.

Our position, consistently set out during the 2022 RoRI process (p8-13, available here) and supported by other stakeholders, is that the ERA should give full weight to the arithmetic mean. The ERA's own calculations support this approach.

For example, the ERA estimates for the period from 1958-2024 are an arithmetic mean of 6.70% and a geometric mean of 4.58%. Suppose the return on an investment is determined each year via a random draw from a distribution with a mean of 6.70% and variance as observed in the HER data set. Over a 67-year period that process would produce (in expectation) an arithmetic mean of 6.70 percent and a geometric mean of 4.58 percent. That is, if the ERA believed that, over a future time period, a regulated utility ought to be able to match the geometric mean of 4.48 percent, the allowed return for each year would have to be set in line with the historic arithmetic mean of 6.7 percent to allow for the fact that actual returns would vary year to year (assuming the same variance as occurred in the sample set). If the allowed return for each regulatory year was set in line with the historical geometric mean, the future geometric mean would inevitably be lower than the historical mean.

Not only does the utilisation of the arithmetic mean align with current regulatory process, but, as noted by Damodaran (2025):[24]

> Many estimation services and academics argue for the arithmetic average as the best estimate of the equity risk premium. In fact, if annual returns are uncorrelated over time, and our objective was to estimate the risk premium for the next year, the arithmetic average is the best and most unbiased estimate of the premium.

The paper the ERA's consultant relies upon, Kaserer (2022) also suggests that:[25]

> We also show that among the simple estimators, i.e. the arithmetic (AM) or geometric mean (GM) or the mean of both (MoM), the first

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[23] We note that there has been a long debate in respect of beta and low beta bias whereby the ERA has been quite emphatic that predictive value against realised returns is not a valid consideration where it is expected returns that it needs to estimate.

[24] See Damodaran, A, 2025, "Equity Risk Premiums (ERP): Determinants, Estimation, and Implications – The 2025 Edition", March 2025, available here, p39. This is an updated version of the 2016 paper cited in the 2022 Explanatory Statement [783] which says essentially the same thing. For clarity, Damodaran does go on to say that stock market returns are often found to be negatively correlated and that this, and cases where the estimation period is longer than one year, the geometric mean can play a role, but he notes the approach of Indro and Lee (1997) in choosing weights. Our focus here is on what he says practitioners do, as it is what they do which drives their expectations of returns.

[25] See Kaserer (2022) p1373. We note that Kaserer implements a number of complex estimators, but the ERA considers only the arithmetic mean, the geometric mean or some combination of the two.

*one tends to perform best unless there is a high degree of negative serial correlation.*

In the discussion below, we trace through the ERA's reasoning for adopting an arbitrary 60/40 weighting in favour of the arithmetic mean. While our position remains that the geometric mean should carry no weight, if the ERA is to assign it any weight, that weight should be based on the evidence before the ERA. This is the same position put forward by us and other stakeholders in 2022, and the Explanatory Statement provides no basis for departing from the evidence-based approach previously advanced.

The ERA's 2022 reasoning

The ERA begins its assessment by noting that its task is to estimate the expected return on equity and that the arithmetic mean is the estimator suited to that task (see Explanatory Statement [800]), noting (ibid [801]):

*The arithmetic mean achieves this as it utilises the mean of the historic probability distribution as the estimate of the future return for the next period. The geometric mean does not have a similar correspondence as there is no probability weighting and only effectively considers two values in its calculation.*

However, rather than adopting the arithmetic mean, the ERA goes on to note:

- Full reliance cannot be placed on the arithmetic mean where there is serial correlation and sampling error (Explanatory Statement [802]).[26] The ERA further notes that the arithmetic mean is biased "in some fashion" (ibid [805]) without quantifying the bias or identifying the evidence relied upon.
- Pink Lake's evidence suggests that, even in the absence of serial correlation, there is reason to put weight on the geometric mean due to measurement error and long investment horizons (Explanatory Statement [802] and [806]). We note that this is in the context of a report where the simulations focus on compounding returns.
- Compounding of returns gives an additional reason to use the geometric mean (Explanatory Statement [809] and [810]). Though it does not appear that the ERA relies upon this as a reason for its decision.

We do not understand what the ERA means when it suggests that compounding provides an "additional reason" to place weight on the geometric means. We are unaware of any evidence that suggests that the geometric mean provides the best estimate of a single period return; even the ERA's own consultant (see Pink Lake, p2) states that the arithmetic mean is theoretically the best estimate of the one-year

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[26] *The ERA's consultant Pink Lake makes this point rather more clearly, noting that "The decision on whether the arithmetic mean alone is an adequate estimator comes down to at least three factors: the uncertainty in the estimation of the arithmetic and geometric means as estimators of the MRP; the length of the investment horizon over which returns are considered relevant; and the presence of autocorrelation in the return series. The available literature shows theoretically that the geometric mean should receive increased weight as one or more of the following occur: the estimation span decreases; the investment horizon increases; or autocorrelation is present in the return series" (p2).*

MRP. We agree with Lally that the regulator provides a single period return in the regulatory model and therefore the arithmetic mean is the appropriate estimator.[27] If the ERA believes that market participants at large compound returns (as it suggests in [810] of the 2022 RoRI) then this is the *only* reason to give the geometric mean any weight, and not an additional reason.

In the context of a compound return, the question of how much weight to give geometric means turns on what one finds in respect of serial correlation. Pink Lake (see below) acknowledges that Indro and Lee's (1997) approach provides an unbiased outcome, and the more complex estimators tested by Kaserer (2022) and Pink Lake only give a minimum mean squared error in the face of strong negative serial correlation.

This is an issue because the ERA has no evidence of serial correlation in the 10 year MRP (that is total market returns minus the ten year risk-free rate) which it now uses, most particularly, it has no evidence of strong negative serial correlation. Evidence to this effect was provided in the 2022 RoRI and the ERA deals with this evidence briefly (see 2022 Explanatory Statement [803]) before dismissing this on the basis that the relevant hypothesis tests may have low power.[28]

Standard practice would involve testing a null hypothesis framed as the absence of something; here serial correlation. Only when the evidence cannot support the null hypothesis is the alternative hypothesis that the thing exists considered valid. The ERA instead appears to presume serial correlation and then require unspecified levels of statistical power before accepting the alternative. It is not clear how this test could be satisfied objectively.

If serial correlation were to be established than, as the ENA points out in their submission to the 2022 RoRI, the correct response would be incorporate this evidence into the estimation of the MRP itself, which would not then be constant through time.[29] If serial correlation cannot be established, and the ERA concludes that it wants an estimate of the MRP which is an unbiased predictor of future compound returns (not single year returns), then the relevant issue becomes the uncertainty in the arithmetic and geometric mean estimates.[30] This can be addressed using established statistical methods to determine weightings, rather than needing the arbitrary weighting the ERA uses.

In submissions to the 2022 Draft RoRI, several networks (see 2022 RoRI Explanatory Statement [720] for the relevant references) provided evidence from

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[27] See Lally, M, 2012, The Cost of Equity and the Market Risk Premium, Victoria University of Wellington, 25 July 2012, pp31-2, available here.
[28] In [803] the ERA quotes a memorandum from CEG (available here) suggesting some evidence of serial correlation in the MRP, driven by the risk free rate. CEG perform three tests on each of the risk-free rate, total market returns and the MRP. In respect of the MRP, two of the three tests find no evidence of serial correlation and one does (all tests of total market return find no evidence; it is serial correlation in the risk-free rate which drives what serial correlation CEG finds in the MRP). This is a very weak result. Moreover, CEG undertake their tests on the five-year MRP (that is, total market returns subtract the five-year risk-free rate). Lally, also cited in [803] of the 2022 RoRI Explanatory Statement, finds no evidence of serial correlation in the ten-year MRP.
[29] See p13 available here.
[30] Pink Lake (p2) also notes the investment horizon as a key concern. However, this issue is addressed by the ERA adopting a 10-year horizon to match the tenor of the risk-free rate.

the literature on appropriate weighting methods.  The ERA's own consultant, Pink Lake, also notes (Pink Lake, ibid, p9):[31]

> There is strong evidence in the literature supporting an Indro and Lee type scheme that assigns partial weight to the geometric mean depending on the length of the time series being estimated (T) and the length of the time horizon (N) to which the estimate of long-term returns, and hence the market risk premium, is to be applied to. The weight towards the geometric mean increases with horizon N.

The ERA rejects the use of this evidence, suggesting that (2022 Explanatory Statement [816]):

> The ERA has considered the evaluation of statistical weighting approaches undertaken by Pink Lake Analytics. It considers that the optimal weights from the evaluated schemes are highly sensitive to assumptions regarding the data generation process of returns, the forecast window and which objective function is preferred for determining forecast error for the purposes of economic regulation. These sensitivities make it difficult to find a robust way to estimate which weights should be provided to the arithmetic and geometric means through statistical methods.  As such, at this stage the ERA will not strictly use the statistical approach, but will set the historic market risk premium estimate informed by the theoretical and analytical conclusions from the Pink Lake Analytics report.

There is a legitimate basis for the ERA to treat Pink Lake's simulation results with caution given the previously noted disconnect between the simulations in the paper and the regulatory task.

However, this does not mean that the wider evidence should be ignored.  In particular, papers already examined by the ERA from Indro and Lee (1997) and the two papers by Jacquier et al (2003, 2005) contain robust weighting schemes applicable to the ERA's context.[32]  Applying those schemes to a ten-year investment horizon (assuming that returns compound) yields the weights shown in Table 3, consistent with the ERA's own practice of estimating a ten-year MRP alongside a ten-year risk-free rate.

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[31] Pink Lake note (p13) a preference for the estimator of Jacquier et al which minimizes mean squared error over the Indro and Lee (1998) which minimizes bias.  However, as noted above, the ERA focuses on unbiased estimators.
[32] Other weighting schemes assessed by Kaserer (2022) are found to be appropriate in that paper in the context of an environment of substantial negative serial correlation, for which there is no evidence in Australia, and for that reason, they are not included here.  If such evidence were to emerge, and the ERA were to focus on minimising mean squared error and not bias (as Kaserer does), then one of these more complex weighting schemes could be used.  We note that the author who derived many of the estimators Kaserer tests (including the one Kaserer concludes predicts best in an environment of strong negative autocorrelation) has himself provided advice to UK regulators which suggests that regulators should use arithmetic means (cited on p 20 off NERA, 2015, Historical Estimates of the Market Risk Premium; A report for a variety of energy networks, available here).  Importantly, none of the evidence, in cases of serial correlation or not, supports the 60/40 weight the ERA uses.

*Table 3:* *Arithmetic and geometric mean weights from Indro and Lee (1997) and Jacquier et al (2003, 2005)*

| Time period | Indro and Lee Arithmetic Weight | Indro and Lee Geometric Weight | Jacquier et al Arithmetic Weight | Jacquier et al Geometric Weight |
|---|---|---|---|---|
| 1958-2024 | 0.864 | 0.136 | 0.85 | 0.15 |
| 1980-2024 | 0.795 | 0.205 | 0.78 | 0.22 |
| 1988-2024 | 0.750 | 0.250 | 0.73 | 0.27 |
| 2000-2024 | 0.625 | 0.375 | 0.60 | 0.40 |
| *Average* | *0.759* | *0.241* | *0.74* | *0.26* |

*Source: Indro, D and Lee, W, 1997, "Biases in Arithmetic and Geometric Averages as Estimates of Long-Run Expected Returns and Risk Premia", Financial Management, 26(4), 181-90, available here, equation 22. Jacquier, E, Kane, Al and Marcus, A, 2003, "Geometric or Arithmetic Mean: A Reconsideration", Financial Analysts Journal, 59(6), 46-53, available here, equation 6. Jacquier, E., Kane, Al. and Marcus, A. 2005, "Optimal Estimation of the Risk Premium for the Long Run and Asset Allocation: A case of compound estimation risk", Journal of Financial Econometrics, 3(1), 37-55, available here, equations 7 and 8. Note that the equations in each Jacquier paper, although expressed differently, result in the same weighting between arithmetic and geometric means.*

We (and others) presented similar evidence in 2022. It was rejected, but the ERA gave no reason to reject this save that available literature reports different (although, as shown above, not materially different) weights, and that other weights produced by the ERA's consultant in a stylised simulation (which had issues as we outline above), were sensitive to that simulation.

The ERA's response was to adopt a set of weights unsupported by any of the evidence before it. Our position remains that the geometric mean warrants no weight: it is not used by regulators or practitioners, and all of the literature we are aware of, including the Pink Lake report, notes that the arithmetic mean is the right approach for estimating an expected single period MRP. However, if the ERA is to assume compounding returns and to maintain its approach of giving some weight to the geometric mean, it should base that weight on the evidence it has before it and not simply use arbitrary weights which lack justification.

### 3.2.2. Constant vs varying MRP

In the 2022 RoRI, the ERA discussed at length the relationship between the risk-free rate and the MRP (see Explanatory Statement pp155-7) ultimately determining that, although some relationship may exist, it could not be accurately quantified and might not be constant through time (see Explanatory Statement [887]). Although we do not necessarily agree with the ERA's assessment of the relevant evidence in 2022, our key point in this submission is the use of an unvarying MRP, which is logically inconsistent with the way in which the MRP estimate is formed. This is a key issue which remains; a relationship between the MRP and risk free rate is merely one possible way in which the MRP might vary, so rejecting the relationship is insufficient to adopt a fixed MRP. We discuss this further below.

Following its assessment of the evidence concerning the relationship between the risk-free rate and MRP, the ERA concludes (Explanatory Statement [888]) that it will not use any such relationship in forming the estimate of MRP but (ibid, [889]):

*Instead, to estimate the market risk premium the ERA uses multiple inputs, including forward looking DGM estimates and conditional variables, to develop the best estimate to apply for the gas instrument.*

And further that (ibid [890]):

*The ERA considers that the DGM estimates of the market return do not induce a mechanical negative relationship with the risk free. It attempts to recover whatever relationship may exist at the time of estimation given assumptions, where the DGM as a conditional estimator can be sensitive to short-term changes in the market risk premium. Currently, the ERA is agnostic as to what the relationship is at any point in time, but will incorporate what market expectations are signaling through the DGM estimate.*

The historical average is an unconditional mean of the whole sample period, whereas the DGM is a conditional mean reflecting information available at a point in time. To use both together when forming the MRP estimates is to conclude that both unconditional and conditional mean information are relevant to forming the MRP estimate. To then set a fixed MRP is to conclude that only unconditional mean information is important in using the MRP estimate.

There is, therefore, a logical inconsistency between how the ERA forms and then subsequently uses the MRP estimate. In simple terms, if the ERA followed the same approach it used to form its RoRI in 2022 in any of the subsequent AA decisions it made, it would likely have chosen a different MRP estimate than that which was chosen in the RoRI as the conditional mean would have changed, so the MRP derived in the RoRI cannot represent the efficient cost of financing that prevailed at the time any AA decision was made under it.

The ERA is therefore faced with a choice:
- it can conclude that the market risk premium is effectively fixed or changes so slowly that one estimate every four years is sufficient to capture market expectations and set a fixed MRP; or
- it can conclude that the market risk premium changes through time and use an approach which is capable of delivering a changing MRP through the different AA decisions it makes whilst the RoRI is current.

Since the DGM is a conditional mean estimate, it could play no role in the first option above. It can play a role in the second option above, but only so long as its estimate is updated through time. What the ERA did in its 2022 RoRI is implictly assume that the DGM, and by extension current market expectations, play a role only in the handful of months leading up to the formation of the RoRI, but then play no role at all in forming market expectations during the life of the RoRI. This position is illogical.

The important question for this RoRI is therefore not whether there is a relationship between the risk-free rate and the MRP. The answer to which only determines whether variations in the risk-free rate can be used to infer variations in the MRP and says nothing about whether the MRP itself is fixed or varying.

The question the ERA needs to answer is whether the MRP changes and then produce a mechanism which reflects its best and most feasible answer. This requires the following steps:

- Answer the question "does the MRP change through time sufficiently quickly that one estimate every four years is insufficient?"
    - If the answer is no, then the solution is simply to use long-run historical averages of some form (see discussion in Section 3.2.1 above).
    - If the answer is yes, move to the next question.
- The next question, contingent upon the answer to the first, is "what method best captures change, or the conditional MRP at a point in time.
    - If the answer to this is the DGM, then a question can be asked about what form of DGM and what kind of parameterization of the DGM is appropriate; an issue the ERA picks up in Question 12 of its Discussion Paper.
    - If the answer is some other model, then the same questions can be asked about those models (including "model free" options such as consideration of conditional variables).
- Once the appropriate model is chosen, the question can be asked "how can we update these estimates through time?". In answering this question:
    - the ERA needs to consider the restrictions placed upon it by the NGL in respect of "mechanistic" approaches; and
    - the ERA needs to establish how best to balance information from long run and conditional estimates of the MRP (just as it does for the single point in time when it forms the RoRI), in a mechanistic manner.

It is plausible that, after working through these steps, the ERA reaches what it considers a second-best position – namely that no feasible mechanistic updating rule satisfies all constraints.

If this is the case, the second-best estimate cannot be an estimate which uses both unconditional and conditional information (historical average and DGM estimates) at the point in time when the RoRI is made but which is then fixed in time, because it is illogical. Rather than being a second-best estimate, this approach gives an $n^{th}$ best estimate because the ERA does not know how the MRP might vary through time after the point in time where it makes its RORI and therefore what decision it would have made at a given AA had it made that decision on MRP in the same way as it did in its RORI.

AGIG maintains its view from the 2022 RoRI that the best approach for the ERA would be to adjust the MRP through time to reflect changes in market conditions, and that doing so using the mechanistic approaches we outlined in our submission to the 2022 RoRI discussion paper remain feasible.[33] In its 2022 RoRI (see 2022 RoRI Explanatory Statement [906]):

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[33] See p25 of our submission to the ERA's 2022 RoRI Discussion Paper in February 2022, available *here*. *Given the ERA's subsequent views about the relationship between the risk-free rate and MRP, the first would appear to be*

*After further consideration of both the fixing and updating approaches, the ERA maintains 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.*

We would agree with this statement.[34]  However, perfection is not required and a degree of imperfection is preferred to a logically inconsistent position.  For these reasons, the ERA should revisit its decision in respect of a fixed MRP and either:

- Use a combination of DGM and historical averages (as it does already) but combine them in a mechanistic fashion and update the information to calculate the MRP anew at each subsequent AA; or
- Use only an unconditional mean (historical average).

Both options maintain internal consistency. The former is, in our view, superior, but either is preferable to the current approach.

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*more suitable than the second approach we suggested.  Alternatively, a simple (pre-specified) weighted average between the DGM and historical average would perform the same role.  We note that this first approach was based on what the ERA itself did at part of its 2013 Guideline.  Although this Guideline was not a binding instrument, the mechanism was mechanical enough, we believe to be used with a binding instrument.  We provide some commentary on this approach in our submission to the ERA's 2018 Draft Guideline (p10) in September 2018 (no longer available on the ERA's website).  There we noted that a previous decision for ATCO had used a weight of 62 percent on historical returns and 38 percent on the DGM, whereas the decision made sometime later, when market conditions were different, for DBP was a 60/40 weight.  If the differences when the ERA could change the weights were as small as this, then it seems unlikely that fixing the weights of conditional and unconditional mean estimates of the MRP for the duration of a RoRI is likely to lead to major issues.*

[34] *We would also agree with the later statement in ibid [908] that the ERA cannot exhaustively document how it would use regulatory discretion in every conceivable circumstance.  However, it does not need to; all it needs to do is develop a simple mechanism which is capable of giving a second-best answer that is logically consistent with its approach, rather than using an approach with is logically inconsistent.  We note that in other areas, the derivation of beta, for example, the ERA is able to make concessions to perfection and it is unclear why it cannot do so in respect of MRP.*