A hybrid approach that has regard to market data

Response to AER Review of Regulatory Treatment of Inflation

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Energy Networks Australia

Contents

1 Overview

- What is the problem with the current approach?
  - It creates a cycle of under-and over-payment. Networks and consumers are both exposed to this risk. For some regulatory periods, consumers under-pay and networks under-recover relative to the benchmark efficient cost. In other regulatory periods, the reverse is true.
  - It relies on a single source of information for estimating expected inflation that has not been producing reliable estimates over recent years.
- What are the proposed solutions?
  - A simple change to the regulatory model to ensure that every generation of consumers pays only the AER's estimate of the benchmark efficient cost.
  - Use of all relevant information when estimating expected inflation.
- What outcomes will be achieved?
  - The cycle of under-and over-payment will be eliminated. Every generation of consumers will pay only the benchmark efficient cost.
  - The AER's estimates of the benchmark efficient return on debt and equity will be delivered via the regulatory framework.
  - Regulatory estimates of expected inflation will better reflect the prevailing market conditions.
  - There will be no material change in the level or volatility of prices.
  - Strong leadership in regulatory governance will be demonstrated by leading stakeholders through a process to adapt the regulatory regime to a changing environment.

1.1 A focus on benchmark efficiency

Energy Networks Australia (ENA) welcomes the opportunity to provide this submission to the AER's review of the regulatory treatment of inflation. Consistent with good regulatory practice, the AER has identified that recent evidence indicates that a change in practice may be required to ensure its approach is consistent with the NEO and NGO.

This submission takes the AER's allowed return on debt and equity as given and seeks to ensure that the regulatory regime delivers it.

ENA urges the AER to not miss this opportunity to identify where the regulatory regime should be modified to ensure it continues to provide incentives for efficient investment.

The proposals in this submission:

- Are all based on the notion that every generation of consumers should pay only the AER's estimate of the benchmark efficient cost of providing the service to them;
- Result in no price shocks to current consumers and no change to the volatility of prices;
- Do not transfer any risk from networks to consumers; and
- Are consistent with the efficient operation of, and investment in, network businesses – in the long-term interests of consumers.

Since the AER's last review of its approach to estimating expected inflation, market conditions have evolved. The gap between the AER's inflation forecast on one hand, and market expectations and actual outcomes on the other, has continued to widen materially. This means that the AER's regulatory decisions are now not delivering the AER's own allowed efficient return on investment – because the deduction for the AER's estimate of expected inflation is greater than any reasonable expectation of actual inflation outcomes.

Consistent with good regulatory practice, the AER has recognised that recent data indicates that it should consider whether its current approach remains appropriate. ENA strongly supports this review – to promote regulatory predictability it is essential that when a regulatory approach is no longer optimal, action is taken to ensure the regulatory regime continues to deliver sensible regulatory outcomes, benefiting consumers.

The current approach is producing unsustainable outcomes with recent decisions consigning some networks into loss-making positions when those decisions take effect.

This results in some generations of consumers under-paying relative to the AER's estimate of the efficient cost, at the expense of other generations of consumers over-paying.

ENA's proposed amendments are designed to ensure that:

- Every generation of consumers pays the AER's assessment of the benchmark efficient cost – no more and no less; and
- Every generation of network investor receives the AER's estimate of the benchmark efficient rate of return – no more and no less.

It is important that action is taken now, and that it is not left to future generations to address the "underlying inconsistency" that Sapere have identified in its report to the AER, whereby the AER's current estimate of expected inflation is inconsistent with the AER's allowed nominal return on equity.

1.2 The current approach is producing unsustainable outcomes

The current approach is producing a number of outcomes that are unsustainable and which have never before arisen from AER decisions. These outcomes include:

- The approach currently produces regulatory allowances that will put networks in a loss-making position every year. Recent regulatory decisions embed negative profits for the benchmark efficient network firm.
- If financial market participants adopt the same inflation expectations when investing in equity securities as they do when investing in other financial securities, the current (total nominal) expected return on equity in network businesses (including assumed future capital gains) is 2.06%.
- The approach currently sets a real regulatory allowance on the basis that the real risk-free rate is -1.5%, when the observed real risk-free rate (available to investors in the real world) is 150 basis points higher.

Energy Networks Australia agrees with the conclusions of the AER commissioned Sapere report that a negative profit allowance may:

> *indicate an underlying inconsistency*[1]

that:

> *would not be consistent with the efficient investment and efficient operation of an NSP.* [2]

The AER's allowed return on equity is currently at a record low level of 4.56%. Section 9.1 of this submission shows that investors who expect inflation to be lower than the AER's estimate of 2.3%, will expect to receive even less than this. Indeed, an investor who expects inflation to be in line with market estimates (rather than the AER's estimate) will expect a return on equity of approximately 2% p.a.

This is already having tangible effects. Capital expenditure remains near decade lows, and network investors are reluctant to fund the sort of augmentation capex that is required to support network security as Australia's energy mix changes over coming years. For example, Section 9.6 notes the material reductions in augmentation capex that are set out in the AER's most recent State of the Energy Market report.

Implementing a reasonable approach to regulatory inflation is a key step in repairing the regulatory framework and restoring confidence in it.

1.3 Implications for consumers

Under the current approach, consumers pay the benchmark efficient trailing average cost of debt plus a random amount that depends on the extent to which actual inflation differs from the AER's figure.

This results in some generations of consumers under-paying relative to the AER's own estimate of the efficient cost, at the expense of other generations of consumers over-paying relative to the AER's estimate of the efficient cost.

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[1] Sapere report, paragraph 10.
[2] Sapere report, paragraph 11.

ENA's proposed amendments are designed to ensure that every generation of consumers pays the AER's assessment of the benchmark efficient cost – no more and no less. This submission takes the AER's allowed return on debt and equity as given and seeks to ensure that the regulatory framework delivers it.

ENA's proposals will not result in any material change in the level or volatility of prices for current or future consumers.

Also, ENA's proposals do not transfer risk from networks to consumers. Rather, the goal is to remove risk from both networks and consumers. Under the AER's current approach, sometimes consumers over-pay and networks under-recover relative to the AER's estimate of the benchmark efficient cost, and sometimes the reverse occurs. ENA proposes an approach to end the cycle of under- and over-payment.

1.4 There are two problems to address

There are two key problems with the AER's current approach:

- **The debt allowance problem**

  The nature of the debt allowance problem is as follows:

  - A prudent and efficient network issues nominal debt and is contractually required to make nominal interest payments; but
  - The AER's regulatory allowance does not match the efficient costs that the benchmark efficient network is contractually required to pay.

- **The inflation forecasting problem**

  A problem arises where the AER's estimate of expected inflation differs from the market's inflation expectation. In this case, the AER's estimate of the required real return will differ from the real return that is actually required by investors.

  Over recent years, the gap between the AER's inflation figure on one hand, and market expectations and actual outcomes on the other, has continued to widen. The AER's own consultants expect inflation to be materially lower than the AER's current estimates.

1.5 The debt allowance problem

The nature of the debt allowance problem is that the AER's regulatory allowance does not match the efficient costs that the benchmark efficient network is contractually required to pay.

The appropriate remedy is to match the regulatory allowance to the AER's estimate of the efficient costs that the benchmark entity is contractually required to pay.

That is achieved by simply using the same inflation figure when:

- Deducting inflation in the process of setting allowed revenues in the PTRM; and
- Adding back inflation in the process of RAB indexation in the RFM.

This remedy ensures that, in each regulatory period:

- Networks receive a regulatory allowance that matches the efficient cost of debt that the benchmark entity is contractually required to pay – no more and no less; and
- Consumers pay the AER's assessment of the benchmark efficient cost of debt – no more and no less.

This remedy also has a number of other benefits:

- It satisfies the NPV=0 principle because it matches the regulatory allowance to the benchmark efficient cost;
- It results in all consumers only ever having to pay the efficient cost of debt; and
- It provides for networks to bear all of the risk that stems from any deviation from the AER's assessment of the prudent and efficient benchmark financing approach.

Section 4 of this report notes that the AER has previously[3] noted that it has deliberately set a real allowance for the return on debt and left it open to networks to depart from that 'efficient benchmark' if they wished. However, there have been two developments on this issue:

- The AER does not set a real allowance for the return on debt. The AER now subtracts an estimate of current inflation from a 10-year nominal trailing average. This does not correspond to any financing strategy, including the strategy of issuing real / inflation-indexed debt.
- There is evidence that the market for corporate debt linked to Australian inflation is very small such that it would be infeasible for networks to finance themselves in that way, notwithstanding the impacts of the trailing average methodology. This raises questions about whether it is appropriate to have a prudent and efficient benchmark that is impossible for any network to implement.

1.6 The inflation forecasting problem

The key feature of the AER approach is the assumption that inflation is expected to be 2.5% in FY23 and every year thereafter.[4] However, the evidence indicates that assumption is currently unreasonable. There is simply no evidence to support the notion that inflation is expected to be 2.5% in FY23 and every following year. Indeed, there is overwhelming evidence against that proposition. Thus, the contention that

[3] AER, December 2017, Final Decision: Review of Regulatory Inflation, pp. 8-9.
[4] Prior to its current approach, the AER's approach was to estimate expected inflation from nominal and inflation-indexed government bonds. However, that approach broke down during a period when the Commonwealth Government had retired so much debt that there was not a sufficient volume of inflation-indexed bonds on issue to obtain reliable estimates. As that approach was not producing reliable estimates, a change was made to the current approach, which was deemed to produce more reliable estimates at that time. Since that change was made, there have been two key developments. The first is that Commonwealth Government debt levels have increased materially and are scheduled to increase further in future, so there is now no shortage of government debt. The second is that the current approach is now not producing reliable estimates in the prevailing market conditions. In particular, the assumption that inflation will return to 2.5% after two years is currently untenable.

2.5% is the best available estimate of expected inflation starting as soon as FY23 is implausible, in which case alternative approaches should be considered.

Internationally, under comparable regulatory regimes, regulators have chosen to not place dominant weighting to policy target rates or bands. In the context of its consideration of the issue of expected inflation in upcoming network determinations, for example, Ofgem has recently observed:

> *While using the Bank of England inflation target of 2% has the benefit of simplicity we have concerns that it is also not a measure of expected inflation (it is a target but may not represent market participants' expectations.)*[5]

ENA proposes that material regard should be given to financial market data such as inflation swaps and break-even estimates derived from government bonds. This is because financial market participants are likely to adopt the same inflation expectations when investing in equity securities as they do when investing in other financial securities. Thus, the information embedded in financial market data is relevant evidence that should be given material weight when estimating expected inflation.

Moreover, the market estimates are entirely appropriate for regulatory purposes because they are commensurate with the role that the inflation parameter plays within the AER's regulatory framework and models:

- The AER's approach to inflation is to deduct a fixed amount when determining allowed revenues in the Post Tax Revenue Model (PTRM) and to add back an amount equal to actual inflation when indexing the Regulatory Asset Base (RAB) in the Roll Forward Model (RFM). This is designed to convert a fixed nominal return into a fixed real return.
- Consequently, what is required is an estimate of the price that would be reasonable to pay to convert a fixed nominal return into a fixed real return. That is: what price would it be appropriate to pay (i.e. to deduct from allowed revenues) in return for a promise to receive a payment based on actual inflation outcomes?
- That is precisely what the market estimates provide. Thus, the market estimates provide a direct estimate that properly reflects the function of the inflation parameter in the AER's models. The market estimates tell us precisely what it costs to convert fixed nominal returns into fixed real returns in the Australian financial market.

The AER has previously rejected the market evidence on the basis that it provides an estimate of the price of converting nominal into real, rather than an actuarial estimate of 'expected inflation'. But far from being a disadvantage, the market estimates have the great advantage of being perfectly consistent with the role that the inflation parameter plays in the AER's framework.

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[5] https://www.ofgem.gov.uk/system/files/docs/2020/07/draft_determinations_-_finance.pdf, paragraph 2.75.

For clarity, ENA does not submit that the AER should always adopt one or other of the market estimates in a mechanical way. Rather, ENA submits that it is not possible to obtain the best estimate of expected inflation for use in the AER's framework without giving material weight to evidence that:

- Is perfectly consistent with the role that the inflation parameter plays in the AER's framework;
- Is consistent with the AER's reliance on market data when estimating other parameters;
- Is based on observed market prices set in financial markets, reflecting market outcomes where real money is at stake; and
- Is used by other regulators such as the Victorian Essential Services Commission (VESC) and the Economic Regulation Authority of Western Australia (ERA) for the reasons set out above.

1.7 Principles to guide the process

ENA considers that the following principles should guide the review of the regulatory approach to expected inflation:

- In each regulatory period, the regulatory regime should provide compensation for benchmark efficient costs and consumers should pay only for benchmark efficient costs; no more and no less.
- The expected inflation figure that is adopted should:
  - Properly reflect the role that parameter performs in the regulatory process; and
  - Have proper regard to all of the relevant evidence.

1.8 Summary of energy network sector proposals

Energy Networks Australia proposes that:

- **A different approach to regulatory inflation should be taken for the allowed return on debt and the allowed return on equity**:
  - A prudent and efficient benchmark firm will issue nominal debt. Consequently, the regulatory allowance should be commensurate with the AER's estimate of the efficient nominal return on debt; and
  - ENA accepts the AER's view that it is appropriate to target a real return on equity.
- **To make the regulatory allowance commensurate with the AER's estimate of the efficient nominal return on debt requires that:**
  - For the 60% of the RAB that is assumed to be financed by debt, the same figure should be used when deducting inflation in the process of setting allowed revenues in the PTRM and when adding back inflation in the process of RAB indexation in the RFM.

- That approach ensures that the regulatory allowance delivers the efficient nominal cost of debt because it starts with the AER's estimate of the efficient nominal cost of debt and then subtracts and adds the same figure.
- The key requirement here is that the same figure is adopted in both places in the AER's process. In relation to the secondary question of *which* figure should be adopted, ENA submits that it is appropriate to use 5-year horizon. This is because the role of the inflation parameter in relation to the return on debt is to ensure that the deduction for inflation in the PTRM is equal to the amount that is expected to be added back via RAB indexation in the RFM. This could be implemented by computing a 5-year geometric average figure, or by using a separate estimate for each regulatory year. The latter approach is motivated by consistency with the NPV=0 principle, as explained in both the Lally and CEG reports in this review.

- **To make the regulatory allowance commensurate with the target real return on equity, the AER's current approach should be maintained:**
  - For the 40% of the RAB that is assumed to be financed by equity, the target real return is delivered by subtracting 10-year expected inflation when setting allowed revenues in the PTRM and adding back actual inflation in the process of RAB indexation in the RFM.
- **When estimating expected inflation, material weight should be given to market data.** This is because, in the AER's regulatory framework, the role of the inflation parameter is to convert a fixed nominal return into a fixed real return. The market data is a direct estimate of the cost of converting nominal to real, so it is perfectly consistent with the role that the inflation parameter plays in the AER's framework.

1.9 Observations about the AER's review process

ENA wishes to record the industry's substantial concerns about the process for the current review. The AER has commissioned three expert reports, which have already been finalised. However:

- There was no opportunity for stakeholders to provide any input into the questions that the AER has asked its consultants to consider;
- The reports were finalised even before the consultants had seen any stakeholder submissions. So, the reports were unable to respond to or engage with any changes to the approach to regulatory inflation proposed by stakeholders or to consider the reasoning or evidence presented by any stakeholder. For example, the Sapere report considers a version of the 'hybrid' approach that differs materially from the approach set out in this submission;
- From the brief description of the tasks in the terms of reference, and the discussion of the AER's instructions in the expert reports, it is unclear where to draw the line between the consultants' views and the AER's instructions; and
- Stakeholders were given an opportunity to pose questions to the AER's consultants, but only prior to the consultant reports being made available for review.

As a result, the expert reports do not cover the full range of stakeholder concerns. Consequently, the extent to which the AER can rely upon them in its decision-making is limited.

Moreover, it is important that all stakeholders have confidence that the AER approaches this sort of review on the basis that it is open to being persuaded by the weight of evidence that is presented. Reports that are finalised prior to the receipt of any submissions or evidence from stakeholders do not assist in building that confidence.

1.10 Response to the Sapere report

The key findings of the Sapere report are:

- The AER's regulatory approach does deliver the AER's target real return.
- However, if the AER's estimate of expected inflation differs from the market's true estimate, the AER's framework will deliver the wrong real return.
- Moreover, if the benchmark efficient return on debt is taken to be a nominal return, the AER's framework will deliver the wrong real return to equity holders in any period where actual inflation turns out to differ from the AER's forecast.
- Also, the AER's target real return is the wrong target because the AER's estimate is not consistent with the role of the inflation parameter within the AER's framework. Specifically, the AER's target real return is based on actuarial expected inflation, whereas the AER's framework requires an estimate of the cost of converting fixed nominal returns into fixed real returns.
- Although Sapere were instructed not to comment on the specific merits of the AER's estimates of the nominal required return or expected inflation, Sapere do identify an "underlying inconsistency" in those estimates that is inconsistent with "the efficient investment and efficient operation of an NSP."

Notably, due to its commissioning and finalisation prior to any stakeholder engagement, Sapere's analysis considers a version of a hybrid approach, but it does not consider the hybrid approach that is advocated by this submission.

ENA's key submission in relation to the Sapere report is that the AER should not be seeking to deliver a fixed real return on debt because the benchmark efficient firm issues nominal debt. The AER's own estimates and approach are consistent with a benchmark efficient nominal return on debt. ENA proposes that the regulatory allowance should be set in accordance with the AER's own assessment of the benchmark efficient cost of debt.

Section 6 of this submission contains a detailed response to the Sapere report and sets out a number of questions for Sapere to consider.

1.11 Response to the Deloitte Access Economics report

The Deloitte Access Economics (DAE) report concludes that the AER's current approach "is still fit for purpose at present". This appears to imply that DAE considers

that the AER's current approach should be maintained in the prevailing market conditions.

ENA submits that the DAE report should receive no weight in this review because it is based on dated and irrelevant evidence, is unclear about where to draw the line between the AER's instructions and DAE's own opinions, and presents conclusions about inflation expectations that are materially inconsistent with DAE's own published opinions in other settings.

Section 7 of this submission contains a detailed response to the DAE report and sets out a number of questions for DAE to consider.

1.12 Response to the Lally report

ENA's responses to the key conclusions of the Lally report are:

- Dr Lally recommends that, rather than compute an average expected inflation figure, the AER should use a separate estimate for each year of the 5-year regulatory period. ENA considers that this is appropriate for the return on debt (where the benchmark efficient cost is nominal), but not for the return on equity (where the AER has adopted a benchmark efficient real cost).
- ENA disagrees with the conclusion that market estimates are biased by the inclusion of an inflation risk premium. In the AER's regulatory framework, the role of the inflation parameter is to convert a fixed nominal return into a fixed real return. The market data is a direct estimate of the cost of converting nominal to real, so it is perfectly consistent with the role that the inflation parameter plays in the AER's framework. An actuarial estimate of expected inflation is not.
- ENA agrees with Dr Lally's assessment that his root mean squared error calculations "would not be useful" if the prevailing market conditions differed from the conditions over the historical period from 1993. Because the prevailing conditions are different compared to the aforementioned period, the historical tests are not currently useful in assessing how to set expected inflation in the current environment.

Section 8 of this submission contains a detailed response to the Lally report.

2 Why is action required now?

- Due to the extraordinary global economic conditions, the AER's approach to estimating expected inflation is currently producing a number of outcomes that are unsustainable.
- These outcomes have never before arisen from AER decisions.
- It is urgent that action is taken now. Some networks are facing loss-making scenarios from AER determinations – in recent decisions, the AER's benchmark efficient allowances embed negative net profits.
- The current regulatory framework is now not delivering the AER's own estimates of the efficient cost of capital.
- Sapere have advised the AER that the "underlying inconsistency" between the AER's allowed return on equity and its inflation forecast is producing outcomes that "would not be consistent with the efficient investment and efficient operation of an NSP."
- This submission demonstrates that:
  - The AER's approach, including its approach to estimating expected inflation, currently produces regulatory allowances that put the benchmark efficient entity in a loss-making position. The net profit allowance is negative for every regulatory year.
  - If financial market participants adopt the same inflation expectations when investing in equity securities as they do when investing in other financial securities, the current (total nominal) expected return on equity in network businesses is 2.06%. It would be irrational for any investor to provide equity capital when the expected return is lower than the return that is available on first-ranking debt in the same firm.
  - The AER's approach currently sets regulatory allowances on the basis that the real risk-free rate is -1.5%, when the observed real risk-free rate (available to investors in the real world) is 150 basis points higher.
- Important investment will not proceed unless investors have confidence that AER allowances reflect and deliver intended incentives for investment.

2.1 The need to identify the "underlying inconsistency" in the AER's approach

The AER's approach to estimating expected inflation is, in the current market conditions, producing a number of outcomes that are unsustainable and which have never before arisen from AER decisions.

The current outcomes are so extreme that they cannot possibly be intended. Consequently, consideration must be given to amending the AER's approach in order to produce more sustainable outcomes in the prevailing market conditions.

We note that the Sapere report commissioned by the AER has reached a similar conclusion:

> *...we note that the sustained fall in inflation expectations mean that the parameter estimates determined recently by the AER imply a negative cashflow return on equity for a benchmark efficient entity. An assumption that the benchmark efficient entity would fund dividends (and growth) from depreciation cashflows—that is, spending less on replacement of real capital—**would not be consistent with the efficient investment and efficient operation of an NSP**, at least beyond the short-term. Borrowing to pay dividends may be justified by the higher increase in the RAB (than would be expected with a positive cash rate of return on equity) and consequential increase in revenue, though may alter the cash payment profile for consumers.*
>
> *We suggest that the AER consider, during its 2020 Inflation Review, whether a projected negative cash return on equity might indicate **an underlying inconsistency** in one or more inputs into its estimate of WACC and expected inflation. Some possible aspects to explore might include:*
>
> - *whether the estimate of expected inflation is too high and thus causes the negative cash rate of return on equity*
> - *whether the nominal cost of equity might be under-estimated relative to the estimated expected inflation*
> - *whether the assumed capital structure is efficient, given the relative rates of return to equity and debt.* [6]

ENA agrees with Sapere that it is important to resolve the underlying consistency during the course of this review.

2.2 Unsustainable outcomes

This report identifies a number of outcomes that are unsustainable, including:

» **Networks forced to incur losses**

The AER's approach, including its approach to estimating expected inflation, currently produces regulatory allowances that will put benchmark efficient entities in a loss-making position over coming years.

For example, the allowed returns are such that, under the PTRM:

» SAPN is scheduled to incur losses in every year of its current regulatory period, amounting to $135 million in total;

» Energex and Ergon Energy are scheduled to incur losses in every year of the current regulatory period, amounting to $510 million in total; and

[6] Sapere report, paragraphs 10-11, emphasis added.

- NSW distribution businesses have also been placed into loss-making positions in their most recent determinations.

Under recent AER decisions, the net profit allowance is negative for every regulatory year. Any business that incurs consistent losses is unsustainable in the long run.

- **Expected return on equity of only 2.06%**

  If financial market participants adopt the same inflation expectations when investing in equity securities as they do when investing in other financial securities, the current (total nominal) expected return on equity in network businesses is 2.06%. This calculation is demonstrated in Section 9.1 below.

  It would be irrational for any investor to provide equity capital when the expected return is lower than the return that is available on first-ranking debt in the same firm.

- **Regulatory allowance is inconsistent with observed market data**

  The AER's approach currently sets regulatory allowances on the basis that the real risk-free rate is -1.5%, when the observed real risk-free rate (available to investors in the real world) is 150 basis points higher.

These outcomes, which are only now starting to be embedded into AER decisions, do not promote the long-term interests of current and future consumers of energy as they will serve to:

- Distort investment and consumption decisions;
- Affect the financial sustainability of service providers if maintained; and
- Increase the risk profile of the benchmark entity, with a consequential impact on credit metrics and debt costs. Over the long term, this will increase prices.

This is already having tangible effects. For example, Section 9.6 below notes the material reductions in augmentation capex that are set out in the AER's most recent *State of the Energy Market* report.

Implementing a reasonable approach to the treatment of regulatory inflation is a key step in repairing the regulatory framework and restoring confidence in it.

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3 Key features of the AER's regulatory approach

- Under the AER's current approach, inflation has a material effect in two steps of the regulatory process:
  - The AER deducts its estimate of expected inflation and provides a real return in the form of revenues via the PTRM; and
  - The AER adds back actual inflation in the form of RAB indexation in the RFM.
- Inflation has a minor impact elsewhere in the regulatory process, but those effects are insignificant relative to the two steps set out above.

3.1 Two key steps

The key features of the AER's approach to inflation are as follows:

- The AER begins by estimating the nominal return that investors require (nominal WACC);
- The AER then deducts its estimate of expected inflation and provides the remainder (a real return) in the form of revenues via the PTRM;[7]
- The AER then adds back actual inflation in the form of RAB indexation in the RFM.

An understanding of these two steps of the AER's process is sufficient to appreciate the issues that have been raised about the AER's current approach to regulatory inflation and the remedies that are proposed in this submission.

In summary, the AER deducts its estimate of expected inflation when setting allowed revenues in the PTRM and it adds back actual inflation when indexing the RAB in the RFM.

3.2 Other effects are minor

There are other calculations in the AER's models where inflation is relevant, including:

- The inflation of prices within a regulatory control period;
- The so-called first-year effect; and
- Various minor timing issues.

These other calculations that involve inflation are, however, minor and second-order effects. The AER recognises the small impact of these effects in its Discussion Paper:

[7] For simplicity, this report refers to the AER 'deducting' expected inflation in the PTRM. In practice, this deduction is performed via the Fisher relation rather than a simple deduction. Because the differences are very small, a simple 'deduction' is applied throughout this report when illustrating the various concepts.

> *Under the current approach, delivery of the real rate of return set in our determination for the forthcoming regulatory period is not exact. That is, when actual inflation outcomes are above or below expected inflation, the obtained real rate of return will differ slightly from the targeted real rate of return in our regulatory determination. However, as stated in the final decision of our 2017 inflation review, the deviations around this target appear to be* ***minor and symmetrical****. Further, one of the key deviation sources—the first year pricing effect—acts to offset potential errors in our estimate of expected inflation.*[8]

Consequently, throughout this review it will be important to focus primarily on the two key steps set out above.

[8] AER, May 2020, Discussion Paper: Regulatory treatment of inflation, p. 25, emphasis added.

4 The debt allowance problem

- The nature of the debt allowance problem is straightforward:
  - A prudent and efficient network issues nominal debt and is contractually required to make nominal interest payments; but
  - The AER's regulatory allowance does not match the efficient costs that the benchmark efficient network is contractually required to pay.
- The appropriate remedy is to match the regulatory allowance to the efficient costs that the AER estimates that the benchmark entity is contractually required to pay.
- That is achieved by simply using the same inflation figure when:
  - Deducting inflation in the process of setting allowed revenues in the PTRM; and
  - Adding back inflation in the process of RAB indexation in the RFM.
- This remedy ensures that, in each regulatory period:
  - Networks receive a regulatory allowance that covers the efficient cost of debt that the benchmark entity is contractually required to pay – no more and no less; and
  - Consumers pay the benchmark efficient cost of debt – no more and no less.
- This remedy also has a number of other benefits:
  - It satisfies the NPV=0 principle;
  - It results in all consumers only ever having to pay the efficient cost of debt; and
  - It provides for networks to bear all of the risk that stems from any deviation from the AER's assessment of the prudent and efficient benchmark financing approach.

4.1 The nature of the problem

The nature of the debt allowance problem is straightforward:

- A prudent and efficient network issues nominal debt and is contractually required to make nominal interest payments; but
- The AER's regulatory allowance does not match the efficient costs that the benchmark efficient network is contractually required to pay.

The result of this mismatch is that:

- In some market conditions, the regulatory allowance is insufficient to cover the AER's estimate of the efficient cost of debt, consumers underpay relative to the efficient cost, and equity holders are required to make up the shortfall; and

- In other market conditions, the regulatory allowance is more than sufficient to cover the AER's estimate of the efficient cost of debt, consumers overpay relative to the efficient cost, and equity holders benefit from the excess.

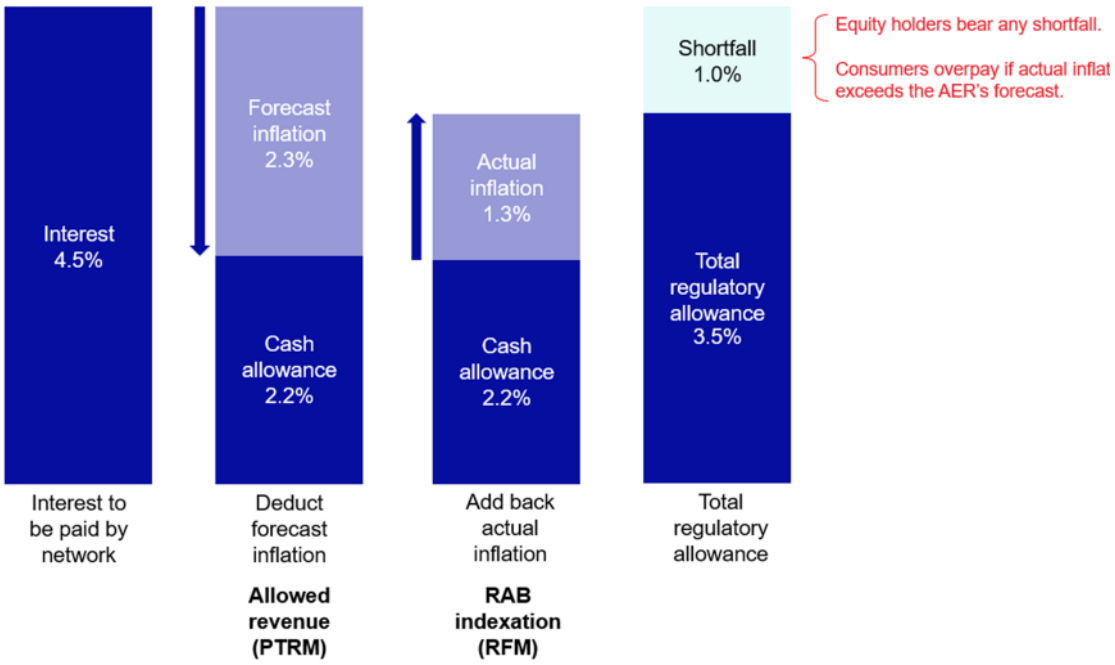
The nature of the problem is illustrated in Figure 1 below, which shows the case where:

- The AER estimates the efficient cost of debt to be 4.5%.
- The AER then deducts its estimate of expected inflation of 2.3% in the PTRM, providing revenues that are sufficient to pay a return of 2.2%; and
- Actual inflation turns out to be 1.3%, which is added back via RAB indexation in the RFM.

In this case, the total regulatory allowance is 3.5%, leaving a shortfall of 1% in relation to the contractual obligation to the lenders. This shortfall must be made up by equity holders.

Had actual inflation turned out higher than the AER's forecast, the regulatory allowance would have been more than sufficient to cover the contractual obligation to the lenders, consumers would have over-paid relative to the efficient cost, and the excess would be retained by the equity holders.

Figure 1: Illustration of the debt allowance problem



Source: ENA illustration.

In summary, the nature of the problem is that the regulatory model provides less than the efficient cost of debt in some market conditions and more than the efficient cost of debt in other market conditions. This section of the submission demonstrates that it is straightforward to amend the regulatory approach to ensure that the regulatory allowance is commensurate with the efficient cost in every regulatory period.

4.2 The proposed remedy

The appropriate remedy is to simply match the regulatory allowance to the efficient costs that the benchmark entity is contractually required to pay, as estimated by the AER. Indeed, the very basis of the regulatory framework is that it would be fair and reasonable for allowed revenues to be set to be sufficient to cover the efficient costs of a benchmark efficient entity – no more and no less.

Matching the regulatory allowance to the efficient costs that the benchmark entity is contractually required to pay is achieved by simply using the same inflation figure in the two steps of the AER's approach.

4.3 The efficient benchmark firm issues nominal debt

Overview

This sub-section establishes that the prudent and efficient benchmark financing strategy involves the issuance of nominal debt.

The AER has previously[9] noted that it has deliberately set a real allowance for the return on debt and left it open to networks to depart from that efficient benchmark if they wish:

> *Several submissions from service providers (prior to the preliminary position) characterised this as either an error or an unintended side effect of the decision to target the initial real rate of return. These stakeholders submitted that the most important outcome was the delivery of the initial real return on equity, and so proposed that we change the inflation objective accordingly. If the benchmark firm issued nominal debt, this would entail a hybrid inflation target: targeting the real return on equity (on the equity portion of the asset base) combined with targeting the nominal return on debt (on the debt portion of the asset base).*
>
> *We consider that this effect was not an error or side effect; rather, it was well understood prior to the adoption of the current approach more than fifteen years ago. It reflects a deliberate policy decision on the appropriate level to assess returns for the benchmark entity—that is, at the service provider level (not the equity investor level). Targeting the overall rate of return means that financing decisions remain the concern of the service provider, who bears the benefit or detriment of all such decisions (on the appropriate gearing level, whether to issue fixed or floating debt, whether to issue domestically or overseas, and so on). It appropriately assigns any risk arising from these financing decisions to the service provider, rather than consumers. If debt is issued in nominal terms, it is not possible to target both the real return on capital and the real return on equity.*
>
> *Although this financing risk is assigned to the service provider, and so inflation can alter returns to equity holders, this does not change the*

[9] AER, December 2017, Final Decision: Review of Regulatory Inflation, pp. 8-9.

allocation of overall inflation risk. Consumers still bear this inflation risk, as the charges they pay move in line with inflation outcomes, and so insulate the business from changes in actual inflation. When inflation causes the real return to equity holders to drop below the initial target, the real return to debt holders rises above the initial target—this is a consequence of the decision to issue nominal debt.[10]

However, there have been two developments on this issue:

- The AER does not set a real allowance for the return on debt. The AER now subtracts an estimate of current inflation from a 10-year nominal trailing average. As explained below, this does not correspond to any financing strategy, including the strategy of issuing real / inflation-indexed debt.
- There is evidence that the market for corporate debt linked to Australian inflation is very small such that it would be infeasible for networks to finance themselves in that way. This raises questions about whether it is appropriate to have a prudent and efficient benchmark that is impossible for any network to implement, even if a real allowance for debt were set.

Nominal debt is the only feasible benchmark

The AER's general practice when determining the benchmark efficient debt financing practice is to have regard to the observed practice of Australian network businesses over a suitable period of time:

- The AER sets the efficient benchmark credit rating using data on actual credit ratings of debt issued by Australian network businesses over time;
- The AER sets the efficient benchmark term of debt using data on the actual term of debt issued by Australian network businesses over time; and
- The AER sets the efficient benchmark gearing level using data on actual gearing of Australian network businesses over 5 and 10 year periods.

It follows that the efficient benchmark type of debt (i.e., nominal or inflation-indexed) should also be informed by the actual debt issuances of Australian network companies over time.

On this point, the evidence is very clear – the overwhelming majority of debt issued by Australian networks, by number and by value, is nominal. The AER has collected information from all regulated networks about the debt issuances that they have made over time.

That data shows that, but for a single bond issued by Australian Gas Networks, all network debt financing involves a contractual obligation to make nominal interest payments. Moreover, Queensland Treasury Corporation (QTC) report that the total outstanding market of corporate debt linked to Australian inflation is only $4.2 billion ($2.7 billion of capital-indexed bonds and $1.5 billion indexed annuities). From this it

[10] NER 6.5.2(c), emphasis added.

can be concluded that Australian networks could not routinely issue inflation-linked debt.

Thus, for the same reasons that the AER has determined that the efficient benchmark firm would issue 10-year BBB+ debt to finance 60% of the RAB, it follows that the efficient benchmark firm should be taken to issue nominal debt.

There is no basis to assume that the efficient benchmark firm would issue inflation-indexed debt given:

- Every Australian energy network adopts a different approach; and
- There is evidence that the Australian market for index-linked corporate debt has such limited depth such that no individual network would be able to raise all, or even the majority, of its debt in that manner.

The fact that the efficient benchmark is nominal debt is also apparent from the AER's approach to setting the allowed return on debt. There are two ways to see this:

- The AER computes a 10-year trailing average of the nominal return on debt. If the efficient benchmark firm should be taken to issue inflation-indexed debt, it would not make sense to compute an average of nominal rates. Rather, the trailing average would be taken over the real rates that the benchmark firm would be taken to have locked in when it issued that debt.
- Suppose a firm was able to adhere precisely to an inflation-indexed benchmark. The AER's regulatory allowance would not match the cost of debt incurred by that firm. This is because the AER's approach has no regard at all to the cost of inflation-indexed debt issued by such a firm. Rather, the AER estimates the efficient nominal cost of debt for each tranche in the trailing average and then deducts its current forward-looking estimate of expected inflation. There is no attempt to measure the cost of inflation-indexed debt. So there is no basis to conclude that the benchmark efficient firm would issue inflation-indexed debt, but then to provide a regulatory allowance that bears no resemblance to that benchmark.
- By contrast, if actual inflation turns out to be consistent with the AER's forecast, Figure 1 above shows that the regulatory framework does deliver precisely the nominal return on debt.

In summary, it is clear that the prudent and efficient benchmark financing strategy involves the issuance of nominal debt. That is, the AER's return on debt allowance reflects an assessment that the efficient benchmark firm issues nominal debt. A debt management approach that is not based on the practice of Australian networks and which is impossible to achieve should not be used as the 'benchmark efficient' approach.

The current approach is not consistent with a real debt benchmark

The CEG report attached to this submission demonstrates that the AER's current approach is not consistent with a real debt benchmark. That is, even if a network used inflation-indexed debt exclusively (assuming that was possible), the current regulatory allowance would not match the cost of that approach.

CEG sets out a series of explanations and numerical examples to support the conclusion that:

> *What the AER's models and methods actually do is start with a trailing average of nominal debt costs over 10 historical years then deducts a 10-year estimate of expected future inflation at the beginning of the regulatory period. This results in a real return that does not:*
>
> - *bear any relation to the real debt costs that an NSP would incur if they funded themselves using inflation indexed debt. To achieve this objective the AER would have to remove a 10-year trailing average of expected inflation;*
>
> *nor does it*
>
> - *result in an expectation that the nominal cost of debt estimated pursuant to the RoRI in step 1 of Figure 2-1 will be recovered. This is true even if actual inflation exactly matches the AER 10-year forecast. This is because actual compensation for inflation is provided in the AER models over 5 years not 10 years.*[11]

CEG then sets out a decision tree for the cost of debt.[12] ENA submits that working through this decision tree would be a useful exercise for all stakeholders during the course of this review process. Essentially, the user determines what the efficient benchmark financing strategy should be and the figure indicates how the regulatory allowance should be set so as to be consistent with that efficient benchmark. It demonstrates that the AER's current approach is not consistent with any possible benchmark financing strategy.

4.4 Why is this a problem now?

Figure 1 shows that the debt allowance problem arises when actual inflation outcomes differ from the AER's forecast. Thus, the debt allowance problem is magnified when the AER adopts an inflation forecast that is likely to differ from actual outturn inflation. This is of particular concern now because:

- Actual inflation outcomes have now been consistently and materially below AER forecasts for a decade; and
- The divergence between AER forecasts and other, particularly market-based, forecasts is currently at an all-time high.

Thus, it is highly likely that actual inflation over the current regulatory period will be materially lower than the AER's forecast, in which case there will be a material divergence between the efficient cost of debt and the regulatory allowance for it.

It is important to note that the debt allowance problem is not caused by a poor inflation forecast – but by the regulatory models not recognising that the benchmark efficient network is contractually obliged to pay nominal interest charges. Thus, the

[11] CEG report, p. 14.
[12] CEG report, Figure 4-2, p. 17.

problem cannot be fully remedied by simply changing the method of forecasting inflation.

However, the problem is magnified by a poor inflation forecast. Thus, improving the inflation forecast will mitigate the severity of this problem, but a full remedy requires that the same inflation figure (however that is obtained) must be used in both steps of the AER's approach.

4.5 Matching the regulatory allowance to the efficient cost of debt: Consumer impacts

Consumers should only ever be asked to pay the benchmark efficient cost of providing the service

ENA's submission on the debt allowance problem is a simple one: The regulatory allowance for the return on debt should match the AER's estimate of the efficient nominal costs that a benchmark entity is contractually required to pay.

Indeed, the fundamental basis of the regulatory framework is that regulatory allowances should be set to match efficient costs; no more and no less. This ensures that:

- Networks receive a regulatory allowance that is just sufficient to cover the efficient costs of providing the service; and
- Consumers pay only the efficient cost of providing the service.

By contrast, as illustrated in Section 4.1 above, the AER's current regulatory model provides less than the AER's own assessment of the efficient cost of debt in some market conditions and more than the efficient cost of debt in other market conditions. This divergence between the regulatory allowance and the efficient cost is obviously problematic for networks, but it also has a number of negative consequences for consumers, including:

- Under the current approach, some generations of consumers pay more than the efficient cost of debt and others will pay less than the efficient cost of debt. There is no clear basis for determining which generations of consumers will under-pay and which will over-pay. Will current consumers (over the current regulatory period) under-pay at the expense of their children, or vice versa?
- The current approach leaves consumers exposed to the risk that actual inflation turns out to be higher than expected. In this scenario, consumers would be required to pay more for the cost of debt, and indeed more than the network requires to meet its (efficient) contractual requirements. This occurs in an environment of high inflation where other living costs have increased.

The National Electricity and Gas Rules require the calculation of the annual revenue requirement,[13] and the return on capital building block,[14] for each regulatory year within the regulatory period.

Moreover, it is generally in the long-term interests of consumers, and consistent with the NEO and NGO and RPP, for regulatory allowances to be set equal to efficient costs in each regulatory period. In this regard, while no longer a requirement of the National Electricity and Gas Rules (given the binding nature of the Rate of Return Instrument), the AEMC previously provided further guidance in setting the allowed return in a way that best contributes to the NEO and NGO. The AEMC concluded that the NEO and NGO were best achieved by setting allowed returns such that:

> *...the rate of return for a [Network Service Provider] is to be* ***commensurate with the efficient financing costs of a benchmark efficient entity*** *with a similar degree of risk as that which applies to the [Network Service Provider] in respect of the provision of [standard control services].*[15]

ENA notes that the AER set its 2018 Rate of Return Instrument in accordance with this objective[16] and observes that it is difficult to imagine how a decision that does not set the regulatory allowance to be commensurate with the efficient financing costs could possibly contribute to the NEO and NGO (which include promoting the efficient operation of services) or be consistent with the Revenue and Pricing Principles (which refer to the network service provider being provided a reasonable opportunity to recover its efficient costs, and with effective incentives to promote economic efficiency).

Setting regulatory allowances to match efficient costs in every regulatory period supports the efficient operation of the firm and provides appropriate economic incentives. Networks have no discretion over interest payments – they are contractually required to make those payments. If the regulatory allowance is insufficient to make those contractual payments, any shortfall will have to be found somewhere or the firm is in default if its debt obligations. This re-direction of funds from elsewhere has flow-on effects as it leaves a deficit elsewhere within the firm. Such deficits have implications for the efficient operation of the firm and on investment incentives. It is not an answer to say that any such deficit may be recovered in a future regulatory period. Recognition of this issue is one key reason the National Electricity Rules and National Gas Rules provide for the determination of individual allowances in relation to each building block component and for each regulatory year of the regulatory period.

In addition, when networks raise debt finance, they are contractually obliged to satisfy a range of debt covenants. Firms are obliged to report any violation of any covenant at any point in time. A violation of any covenant places the firm in default, with

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[13] NER 6.4.2(a), 6A.5.3(a); NGR 76.
[14] NER 6.5.2, 6A.6.2; NGR 87.
[15] Former NER 6.5.2(c), emphasis added. Also, former NGR 87(3)
[16] AER, December 2018, Final Rate of Return Instrument: Explanatory Statement, p. 29.

certain control rights passing to the lenders. That is, it is not enough that allowed revenues are sufficient to satisfy these debt covenants on average over the long run. Rather, debt covenants need to be satisfied at all times, which is made difficult if allowed revenues are set below the efficient cost of debt in some periods.

Where the Rules envisaged that consideration could be given to factors with an impact across multiple regulatory periods,[17] they have explicitly provided for that. The current Rules do not do so in relation to the rate of return on capital.

For the reasons set out above, ENA submits that the regulatory allowance should match the efficient cost of debt in every regulatory year, and this can only be achieved by applying the same inflation figure in both the calculation of the return on debt, and the indexation of the RAB.

4.6 Analogy to trailing average approach to the allowed return on debt

ENA notes that matching the regulatory allowance to the efficient cost of debt was the key rationale when consumers advocated for, and the AER adopted, the trailing average approach. In particular, when proposing a rule change, consumers in 2011 noted that there was a divergence between the AER's regulatory allowance (based at that time on the spot cost of debt) and the efficient cost of debt (reflecting the observation that firms tend to issue debt on a staggered maturity basis).

For example, the Energy Users Rule Change Committee rule change submission observed that:

> *The guiding principle here, equally applicable to the other regulatory building blocks, is that the notional level [regulatory allowance] should reflect what an efficient provider in a competitive environment would incur.*[18]

ENA agrees that the principle of matching the regulatory allowance to the efficient cost applies equally to the return on debt and other building blocks. For example, in the same way that the operating expenditure allowance should match the AER's assessment of the efficient cost in each regulatory period, so should the return on debt allowance (comprising the cash return plus RAB growth) match the AER's assessment of the efficient cost in each regulatory period.

The Major Energy Users group also submitted that the regulatory allowance should reflect the efficient cost of debt:

> *The MEU notes that the draft rules require that the return on debt would be based on the structure that an efficient entity would provide efficient*

[17] Such as former NER 6.5.2(k)(4) and former NGR 87(11)(d).
[18] Energy Users Rule Change Committee Rule Change Request, supporting report, by CEPA, October 2011, Estimating the debt margin, p. 9.

*financing costs. This is an appropriate test and allows the regulator to assess what might be seen as an **efficient debt financing structure**.*[19]

Similarly, when adopting the trailing average approach, the AER stated that:

> *We propose to apply a trailing average portfolio approach to estimate the return on debt. This approach means that the allowed return on debt **more closely aligns with the efficient debt financing practices** of regulated businesses.*[20]

The AER further explained its rationale for seeking to equate its regulatory allowance with the efficient costs in each regulatory period as follows:

> *If the expected [required] return on debt (and equity) raised in a period is different from the return on debt (and equity) allowance for the period, **this difference may distort intertemporal investment and consumption decisions**. That is, it may result in dynamic inefficiency. In particular, if the return on debt allowance is below the expected return on debt this might result in **under–investment**. On the other hand, if the return on debt allowance is above the expected return on debt this would lead to **over–compensation** for the regulated business and customers paying prices that are above efficient levels.*
>
> *Under the trailing average portfolio approach, movements in the market return on debt from **year to year** are reflected in the allowed return on debt. Reflecting market changes during the regulatory control period reduces the scope for sub-optimal investment and consumption levels.*[21]

When explaining its decision to annually update its return on debt allowance, the AER stated:

> *Annual updating minimises the potential mismatches between the benchmark efficient entity's return on debt and allowed return on debt **during the regulatory control period**. This, in turn, reduces the scope for dynamic inefficiency…*
>
> *Option one (no annual updating) may lead to **mismatches between the benchmark efficient entity's return on debt during the regulatory control period and the regulatory return on debt allowance**. This could create investment distortions for the benchmark efficient entity and result in dynamic inefficiency. This problem would be exacerbated where there is a prolonged period of increasing or decreasing rates of return on debt [or, in the current case, a prolonged period of low inflation.]* [22]

In summary, there appears to be universal agreement with the notion that, in relation to the return on debt, the regulatory allowance each year should be commensurate with the efficient cost of debt. This same principle is the basis for ENA's current submission in relation to the debt allowance problem. The proposed change simply

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[19] Energy Users Rule Change Committee Rule Change Request, supporting report, by CEPA, October 2011, Estimating the debt margin, p. 9.
[20] AER, December 2013, Final Rate of Return Guideline: Explanatory Statement, p. 12, emphasis added.
[21] Major Energy Users, October 2012, MEU Response to AEMC Draft Rule Change Amendments, p. 13, emphasis added.
[22] AER, December 2013, Final Rate of Return Guideline: Explanatory Statement, p. 112, emphasis added.

ensures that the regulatory allowance is commensurate with the AER's assessment of the efficient cost of debt each year.

4.7 What is the role of inflation in relation to the allowed return on debt?

The AER's Discussion Paper identifies two potential objectives in relation to the deduction for inflation that occurs when setting allowed revenues in the PTRM:

- The deduction for inflation might have the objective of extracting the inflation expectation that is embedded in the nominal return that the AER has estimated; or
- The deduction for inflation might have the objective of offsetting the benefit of inflation that comes from RAB indexation in the RFM – to eliminate any double counting.

In relation to the return on debt, it is obvious that the second objective applies and the first does not. This is clear because:

- The allowed return on debt is set by taking the average of ten tranches of debt, issued at ten different points in time, each reflecting a different inflation expectation. If the intention was to extract the inflation expectation that is embedded in the nominal return the AER has estimated, that would require a complicated approach involving ten different implied inflation estimates. However, the AER adopts a single forward-looking estimate of expected inflation that can only be consistent with the second objective of estimating the benefit of RAB indexation so as to eliminate any double counting; and
- The AER sets a nominal return on debt allowance, consistent with the real-world evidence of network firms issuing nominal debt. To deliver that nominal return, it is necessary that the deduction for inflation when setting allowed revenues precisely offsets the benefits of RAB indexation to eliminate any double-counting.

That is, the objective in relation to the return on debt is a simple one – the regulatory allowance should reflect the fact that the benchmark efficient network issues nominal debt and is contractually required to make nominal interest payments. This is achieved by using the same inflation figure in both steps of the AER's approach, thereby eliminating any double counting and ensuring that the regulatory allowance precisely matches the efficient cost.

If follows that, in relation to the return on debt, any discussion of a different objective of extracting implied inflation embedded into the nominal returns is irrelevant.

The Lally report reaches the same conclusion:

> *The AER (2020, pp. 10-12) offers contradictory rationales for the inflation deduction in the revenue equations. Initially, it argues that the deduction in (say) equation (2) is* ***to offset (on average) the inflating of the RAB*** *in equation (1). It then asserts that the deduction is to convert the nominal WACC in these revenue equations to a real WACC and, given its use of the ten-year WACC, it therefore estimates the expected inflation*

rate over ten years so that the terms match. The claim concerning conversion from nominal to real is not correct; conversion would require division in accordance with the expectation version of the Fisher formula rather than subtraction. ***The correct rationale is that noted first by the AER****.* [23]

4.8 Balancing risk between equity holders and consumers

ENA's proposed approach eliminates the risk that any generation of consumers will pay any more than the AER's estimate of the efficient cost of debt

The AER's Discussion Paper raises the notion of balancing risk between equity holders and consumers:

> *A further alternative is a hybrid rate of return target, such as targeting the real return on equity and a nominal return on debt. This would improve stability in real returns for one type of investor (shareholders), but worsen stability in real outcomes for consumers. This question goes to the balance of risk between NSPs, their investors and consumers. A change in approach has the potential to impact the balance of these risks and the ultimate level of compensation required.*[24]

However, the above quote mis-characterises the nature of risk in this setting. It is not the case that the ENA's proposed remedy shifts risk from networks to consumers. Rather, it results in the elimination of risk for both parties.

Under the AER's current approach, there are some market conditions in which networks are under-compensated and consumers pay less than the efficient cost and other market conditions in which networks are over-compensated and consumers pay more than the efficient cost. Under the proposed remedy, consumers would only ever pay the efficient cost – never more and never less. That is, the risk of the regulatory framework delivering more or less than the efficient cost is eliminated for both networks and consumers. As noted above, this is precisely the same rationale that underpinned movement to the trailing average approach – that consumers are quite prepared to pay the efficient cost of debt, but no more.

To see this, consider two possible scenarios:

- In the case where actual inflation turns out to be **higher** than expected:
  - Under the AER's current approach, consumers would pay more than the efficient cost of debt (at a time when other costs of living have increased

[23] Lally report, p. 5, emphasis added. ENA considers that this is the appropriate conclusion in relation to the return on debt, but takes a different view in relation to the return on equity, as explained in Section 8 of this submission.
[24] AER, May 2020, Discussion Paper: Regulatory treatment of inflation, p. 37, emphasis added.

unexpectedly) and equity holders would benefit from receiving more than enough to meet the contractual obligations to debt holders; and

- Under the ENA's proposed approach, consumers would pay just the efficient cost of debt and there would be no excess.

- In the case where actual inflation turns out to be **lower** than expected:
  - Under the AER's current approach, consumers would pay less than the efficient cost of debt (at a time when other costs of living have decreased unexpectedly) and equity holders would need to make up the shortfall arising because the regulatory allowance is insufficient to meet the contractual obligations to debt holders; and
  - Under the ENA's proposed approach, consumers would pay the efficient cost of debt and there would be no deficit.

Proposed approach reduces the risk that consumers will pay more when inflation is higher than expected

As noted above, under the proposed approach, every generation of consumers would pay the AER's estimate of the efficient cost of debt – no more and no less. The AER sets the efficient cost of debt using the trailing average approach. That is, under the proposed approach, consumers would pay exactly the (efficient) trailing average cost of debt in every regulatory year.

By contrast, under the AER's current approach consumers pay:

- The efficient trailing average cost of debt; plus
- An additional amount equal to the difference between actual inflation and the AER's forecast of inflation.

The second component can be positive or negative. It is an additional random amount that some generations of consumers will pay and others will receive. That is, under the AER's approach, consumers pay the efficient cost of debt plus some volatile random amount.

Moreover, under the AER's current approach, consumers pay more for the return on debt (and more than networks are contractually required to pay to their lenders) when inflation is higher than expected and other cost of living expenses are higher. ENA's proposed approach removes this risk.

Networks bear the risk of departure from the efficient benchmark

The Sapere report states that:

> *We agree with the AER that NSPs are best placed to bear the risk of their financing decisions, rather than consumers.*[25]

[25] Sapere report, Paragraph 10.

Under the ENA's proposed approach, networks do bear all of the risk of their financing decisions. The regulatory allowance is set to match the AER's estimate of the efficient (nominal) cost of debt for the benchmark efficient entity. Networks are then free to depart from the trailing average approach, or to depart from the 10-year debt benchmark, or to depart from the 60% gearing benchmark. The network, however, bears 100% of the risk associated with those financing decisions – consumers will only ever pay the AER's estimate of the efficient cost of debt.

The AER's current approach of deducting a prevailing 10-year inflation forecast from a historical average of nominal debt costs does not produce a meaningful estimate of the costs of issuing inflation-indexed debt (that would require an historical average estimate of real debt costs). In any event, the efficient financing strategy for networks is not to issue inflation-indexed debt. As explained in Section 4.3 above, there is no basis for the AER to assume that the benchmark firm would, or even could, issue inflation-indexed debt.

It would be unreasonable to conclude that a network was behaving imprudently and inefficiently unless it adopted a debt financing strategy that was impossible for it to implement.

The role of the regulator

The proposed approach reduces risk for both networks and consumers. It ensures that consumers pay, and networks receive, the efficient cost of debt – no more and no less.

ENA submits that the NEO and NGO and Revenue and Pricing Principles are best achieved by setting the regulatory allowance to match the efficient cost. Thus, the regulator must determine the efficient cost and then sets the regulatory allowance accordingly. Having determined that the trailing average nominal cost of debt represents the efficient cost of debt, the regulatory allowance should be set so that is what consumers pay and that is what networks receive.

ENA submits that it would be inappropriate for the AER to consciously set a regulatory allowance that it knows is likely to differ from the AER's own estimate of the benchmark efficient cost (because actual inflation cannot be known in advance) in pursuit of some other objective.

As explained in Section 4.3 above, the AER's current approach reflects neither a nominal or real allowance for the return on debt, but rather some combination that does not correspond to any implementable debt management strategy. The AER's conclusion that this approach helps to produce "stability in real outcomes for consumers" is problematic for the following reasons:

- The regulatory allowance must be set to reflect the benchmark efficient cost to be consistent with the NEO, NGO and Revenue and Pricing Principles. While stability in pricing might be a relevant consideration under the NEO and NGO, it is not an objective that the NEO and NGO elevate above all others;
- To the extent that stability is relevant to the NEO and NGO, it is better dealt with at the end of the regulatory process by smoothing real prices directly, rather than

seeking to apply some sort of 'real smoothing' just to the return on debt component of prices. It is not necessary (or appropriate) to sacrifice the matching of efficient costs in order to achieve "stability in real outcomes"; and

- It is not clear that consumers would want the sort of 'real smoothing' that the AER assumes they would. Under the current approach:
  - Consumers pay more for the return on debt (and more than networks require to meet their contractual debt obligations) when inflation is higher than expected and other cost of living expenses are higher; and
  - Less for the return on debt when inflation is lower than expected and other cost of living expenses are lower.

4.9 Term of expected inflation estimates

This section has established that the key requirement in relation to the return on debt is that the same figure is adopted in both places in the AER's process. In relation to the secondary question of which figure should be adopted, ENA submits that it is appropriate to adopt a 5-year horizon. This is because the role of the inflation parameter in relation to the return on debt is to ensure that the deduction for inflation in the PTRM is equal to the amount that is expected to be added back via RAB indexation in the RFM.

This could be implemented by computing a 5-year geometric average figure, or by using a separate estimate for each regulatory year. The latter approach is motivated by consistency with the NPV=0 principle, as explained in the Lally and CEG reports in this review. For example, the Lally report demonstrates that, in the case of a nominal discount rate, the AER's regulatory framework requires a separate estimate of expected inflation for each year of the regulatory period. This is established in Equations (1) to (3) of the Lally report, wherein Dr Lally concludes that:

> *This reveals that values for $E(i_1)...E(i_5)$ are each required rather than an estimate of expected inflation over the next ten years or even the next five years.* [26]

4.10 Proposed principle, recommended changes and implementation

ENA proposes that the following principle should guide consideration of the regulatory treatment of inflation in relation to the return on debt:

> *Networks should be provided with a regulatory allowance that is sufficient to pay the benchmark efficient interest bill in each regulatory period.*

This principle can be achieved by simply using the same inflation figure when:

- Deducting inflation in the process of setting allowed revenues in the PTRM; and

[26] Lally report, p. 5.

- Adding back inflation in the process of RAB indexation in the RFM.

Implementation of this approach is straightforward. The AER would simply produce an estimate of expected inflation for each regulatory year and use that same figure in both steps of its process (PTRM and RFM) in relation to the 60% of the RAB that is assumed to be financed with debt.

This approach would be implemented for each network business at the time of its next regulatory determination. The RAB roll-forward would be conducted by:

- Applying the AER's forecast of inflation that is used in that network's current determination to the 60% of the RAB that is assumed to be financed with debt; and
- Applying actual inflation for each year for the 40% of the RAB that is assumed to be financed with equity.

5 The inflation forecasting problem

- A problem arises where the AER's estimate of expected inflation differs from the market's inflation expectation. In this case, the AER's estimate of the required real return will differ from the real return that is actually required by investors.
- Over recent years, the gap between the AER's inflation forecast on one hand, and market expectations and actual outcomes on the other, has continued to widen.
- The key feature of the AER approach is the assumption that inflation is expected to be 2.5% in FY23 and every year thereafter. However, the evidence indicates that assumption is currently unreasonable. There is no evidence to support the notion that inflation is expected to be 2.5% in FY23 and every following year. Indeed, there is overwhelming evidence against that proposition.
- ENA submits that, when estimating expected inflation, material weight should be given to market data. This is because, in the AER's regulatory framework, the role of the inflation parameter is to convert a fixed nominal return into a fixed real return. The market data is a direct estimate of the cost of converting nominal to real, so it is perfectly consistent with the role that the inflation parameter plays in the AER's framework.
- ENA does not submit that the AER should always adopt one or other of the market estimates in a mechanical way. Rather, ENA submits that it is not possible to obtain the best estimate of expected inflation for use in the AER's framework without giving material weight, or at least some weight, to the evidence from financial markets because it is:
  - Perfectly consistent with the role that the inflation parameter plays in the AER's framework;
  - Based on observed market prices set in financial markets, reflecting market outcomes where real money is at stake; and
  - Is used by other regulators for the reasons set out above.

5.1 The nature of the problem

The previous section sets out the changes that ENA considers should be made in relation to the return on debt allowance. In relation to the return on equity, the AER's current approach preserves the AER's estimate of the required real return. This is done in two steps whereby:

- The AER first estimates the required nominal return on equity and then deducts its estimate of expected inflation to produce an estimate of the required real return on equity. This real return is delivered via allowed revenues under the PTRM; and
- Equity holders then receive compensation for actual inflation via RAB indexation in the RFM.

That is, the inflation parameter is used to convert a fixed nominal return into a fixed real return.

A problem arises where the AER's estimate of expected inflation differs from the market's inflation expectation. In this case, the AER's estimate of the required real return will differ from the real return that is actually required by real-world investors.

We demonstrate in the remainder of this section that the gap between the AER's estimates of expected inflation on one hand, and market expectations and actual outcomes on the other, is now very material and widening.

5.2 Overview of the AER's inflation approach

The AER describes its current approach to estimating inflation expectations as follows:

> *Our current approach to estimating expected inflation is to use a 10 year geometric annualised average of the RBA's headline rate forecasts for 1 and 2 years ahead and the mid-point of the RBA's target inflation band of 2 to 3 per cent for years 3 to 10.*[27]

That is, the AER's approach adopts the RBA's 1-year ahead and 2-year ahead forecasts of headline inflation. The AER then assumes that the inflation rate will return immediately to 2.5% (i.e. the midpoint of the RBA's inflation target range) in year 3 and remain at that level thereafter—regardless of:

- the market conditions prevailing at the time the AER is deriving its estimate of inflation expectations;
- how high or low the RBA's forecast of inflation is for year 2.

It is important to recognise that the AER's assumption that the inflation rate will return to 2.5% is just an assumption. It is not informed by any public or private RBA forecasts, nor by any other empirical evidence available at the time the AER estimates inflation expectations. In fact, as shown in the remainder of this section, the assumption that the inflation rate in year 3 will return immediately to 2.5% is sometimes made despite overwhelming empirical evidence to the contrary.

Further, the *National Electricity Rules* require the use of the "best estimates of expected inflation" in the PTRM,[28] and the National Gas Rules require that estimates "represent the best forecast or estimate possible in the circumstances".[29] The RBA's target range is not only not the *best* estimate of inflation (for the reasons set out below), but is not an *estimate* at all, but rather a policy target that might or might not be achieved.

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[27] AER, Regulatory treatment of inflation, Discussion Paper, May 2020, p. 21.
[28] NER 6.4.2(b)(1), 6A.5.3(b)(1).
[29] NGR 74(2)(b).

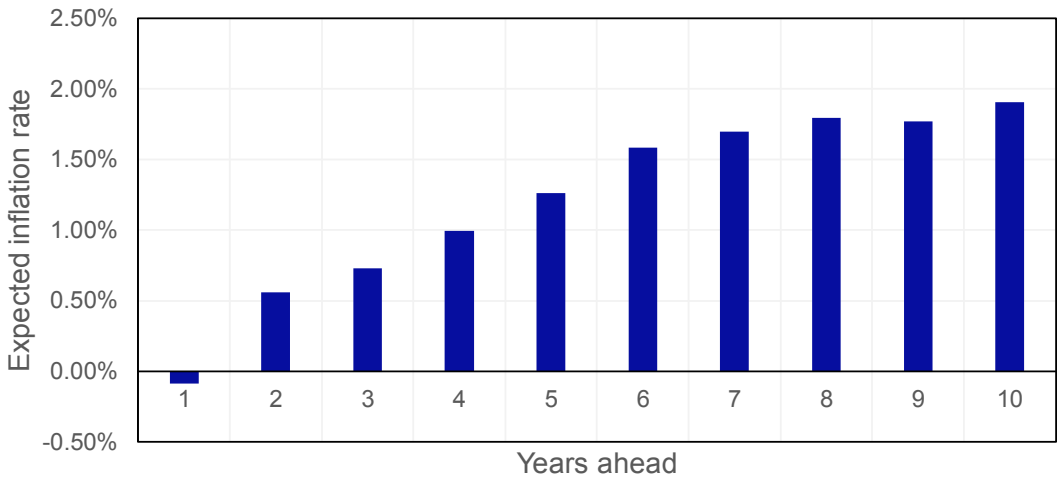
5.3 Inflation expectations derived using inflation swaps

One of the market-based approaches to deriving inflation expectations is to examine the expected inflation rate implied by traded zero coupon inflation swaps. Figure 2 below plots the inflation expectations derived using swaps data:

- over the next 12 months (i.e., the 1-year ahead expectation);
- over the 12 months thereafter (i.e., the 2-year ahead expectation); and so on
- out to the 10-year ahead expectation of inflation.

These inflation expectations are measured using data averaged over a 40-day window (consistent with the AER's averaging window when estimating the risk-free rate) to 30 June 2020, to smooth out the daily variability in the data.

Figure 2: Inflation expectations derived using traded inflation swaps



Source: Bloomberg data, ENA calculations. Note: Data have been averaged over a 40-day window up to 30 June 2020.

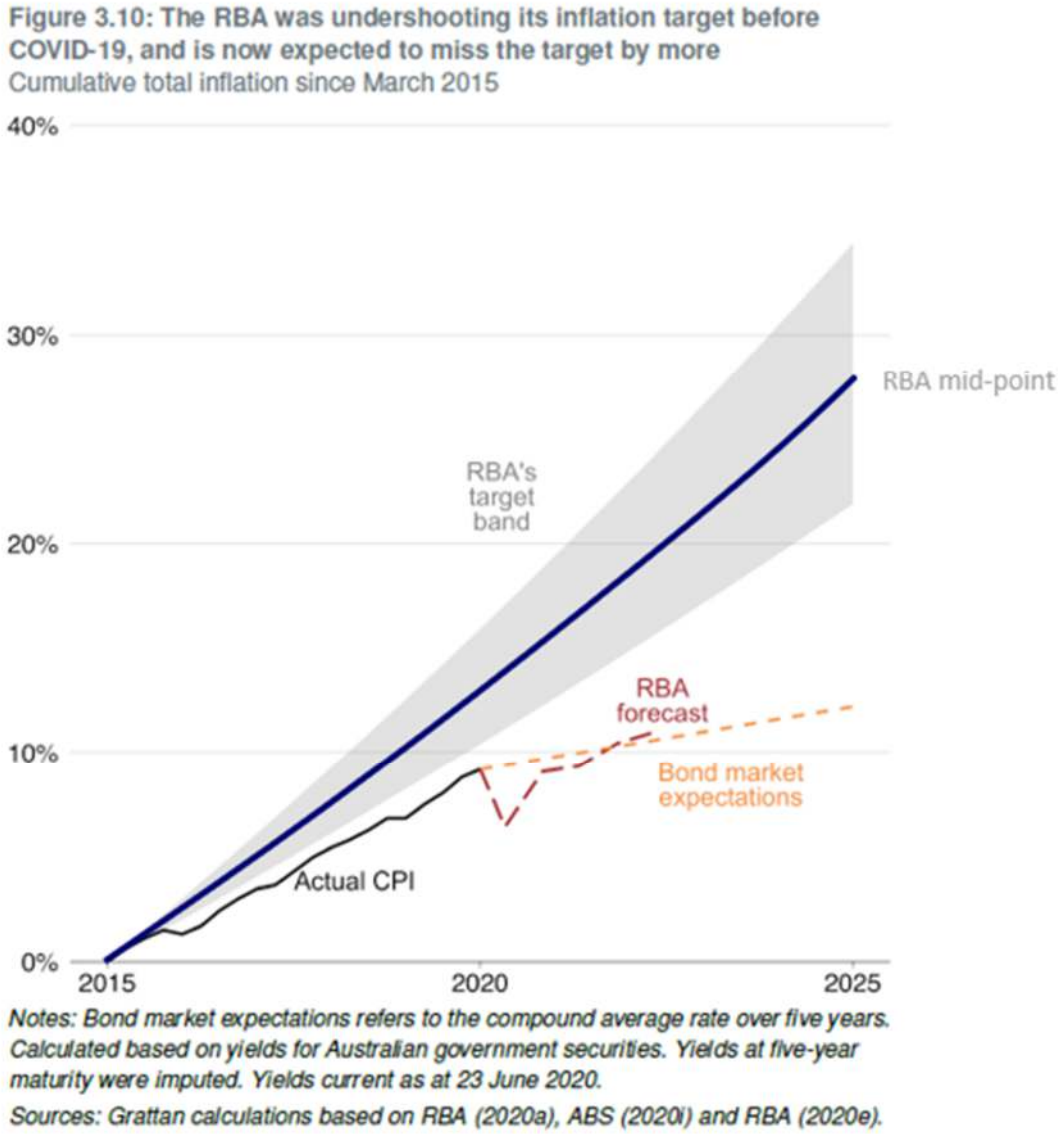
The figure shows that investors trading in inflation swaps currently expect inflation to remain well below 2.5% in every year over the next decade.

5.4 Widening gap between RBA forecasts and target range

In June 2020, the Grattan Institute published a detailed report that considered how recovery of the Australian economy following the COVID-19 pandemic could be organised.[30] Figure 3 reproduces a chart from the Grattan Institute report.

[30] Daley, J., Wood, D., Coates, B., Duckett, S., Sonnemann, J., Terrill, M., and Wood, T. (2020). *The Recovery Book: What Australian governments should do now*. Grattan Institute. (*The Recovery Book.*)

Figure 3: RBA outturn inflation and forecasts



Source: The Recovery Book, June 2020, Figure 3.10, p. 34; 2.5% RBA mid-point added.

Commenting on the data presented in the chart, the Grattan Institute noted that:

> *Figure 3.10 shows the yawning chasm that is set to open up between inflation and the RBA's target. The RBA itself forecasts that headline inflation will grow at an average of just 0.8 per cent between December 2019 and June 2022, with underlying inflation at 1.4 per cent. Union officials and market economists also expect inflation to be below target over the next two years. Financial markets*

> *expect inflation to be well below the target for years to come, pricing in expected 0.95 per cent annual inflation over the next five years.*[31]

The Grattan Institute went on to explain that actual inflation had persistently undershot the RBA's inflation target range. This is evident from Figure 3, which shows that actual inflation has been consistently below 2% p.a. (the very bottom of the RBA's inflation target range) since 2015.

The Grattan Institute noted that:

> *The longer inflation remains below 2 per cent, the further we get from the target of achieving average inflation of 2-to-3 per cent. This is a problem.*[32]

This highlights an important insight: When actual inflation is lower for longer, it becomes ever more difficult to return inflation back to the target range.

The same point has been made in a recent paper by the US Federal Reserve Bank. Andolfatto and Spewak (2019) consider the current global "lowflation" environment. They observe that central bank policy tools are materially more powerful when seeking to lower inflation than when seeking to increase it. They conclude that it is not even credible for central banks to publish lower bounds for inflation because it is:

> *...inherently easier for a central bank determined to lower inflation than for a central bank determined to accomplish the opposite. Among other things, the analysis here suggests that for the central banks of advanced economies, any stated inflation target is more credibly viewed as a ceiling.*[33]

Figure 3 above shows that the RBA has itself forecast a widening gap between actual inflation and the bottom of the RBA inflation target range. Given that "yawning chasm", the prospects of actual inflation returning immediately back to 2.5% by year 3 (as the AER's approach assumes) is unrealistic. The AER's approach does not involve considering whether the immediate return to the midpoint of the RBA range in this fashion is plausible.

5.5 Consensus Economics forecasts

In April 2020, Consensus Economics published consensus forecasts of long-term inflation expectations in Australia.[34] Figure 4, which presents these long-term forecasts, suggests that economic forecasters do not expect inflation to return to 2.5% before 2026. Yet, the AER's approach implies that prices will start growing by 2.5% p.a. in July 2022.

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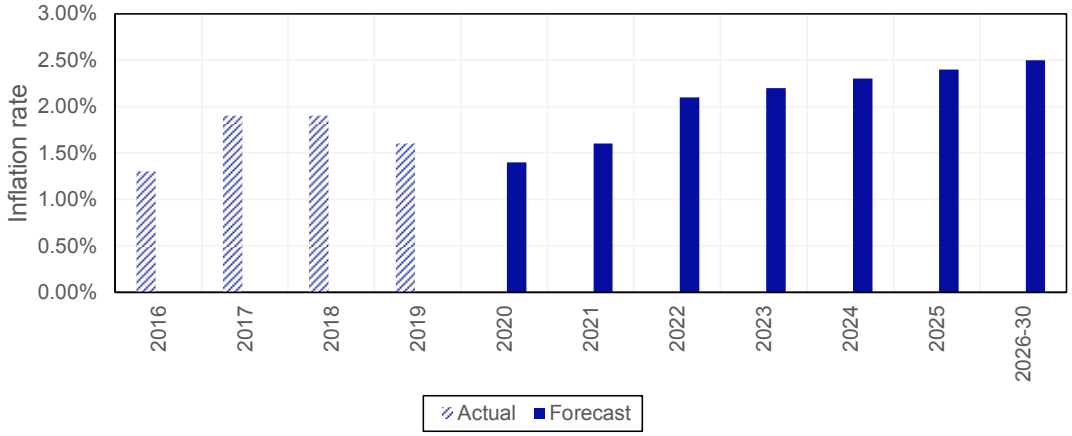
[31] *The Recovery Book, p. 34.*
[32] *The Recovery Book, p. 34.*
[33] Federal Reserve Bank of St. Louis Review, First Quarter 2019, 101(1), pp. 1-26. https://doi.org/10.20955/r.101.1-26.
[34] Consensus Economics, *Surveys of International Economic Forecasts*, 6 April 2020. These forecasts are the most recent long-term consensus forecasts currently available from Consensus Economics.

Figure 4: Long-term consensus forecasts of inflation



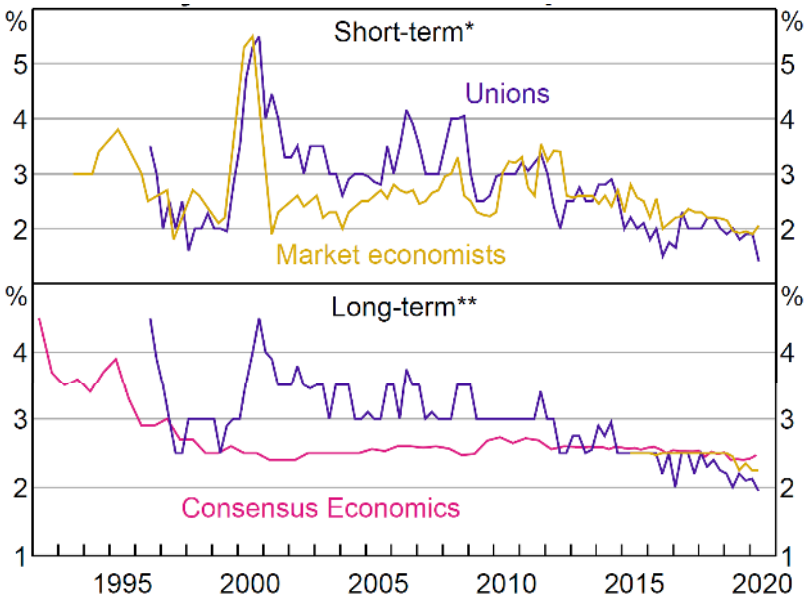
Source: Consensus Economics, April 2020.

5.6 Surveys of trade unions and economists

The RBA's latest (May 2020) Statement of Monetary Policy published survey data that showed that the long-term (i.e., average over the next 5-to-10 years) inflation expectations of Australian trade unions and the RBA's panel of market economists are currently:

- at an all-time-low; and
- materially below 2.5% p.a. (see lower panel of Figure 5).

Figure 5: Inflation expectations of trade unions and market economists



* Over the year ahead

** Average over the next five to ten years for market economists and unions; average over six to ten years in the future for Consensus

Sources: Australian Council of Trade Unions; Consensus Economics; RBA; Workplace Research Centre

Source: RBA Statement on Monetary Policy, May 2020, Graph 5.10, p. 82.

5.7 The AER's approach produces outcomes that are inconsistent with market evidence

The sections above have shown that there is consistent evidence, from a variety of different sources, that the rate of inflation is expected to be well below 2.5% three years from now.

Yet, despite this evidence, when the AER applied its existing approach to derive an estimate of expected inflation in a number of determinations in June 2020, the AER:[35]

- Adopted a 1-year ahead (trimmed mean) RBA forecast of 1.25%;
- Adopted a 2-year ahead (trimmed mean) RBA forecast of 1.5%; and
- Assumed that the inflation rate would immediately leap up to 2.5% in year 3, and remain at that level for the following seven years.

This process produced an estimate of expected inflation of 2.27%. It is the assumption that inflation will return immediately in year 3 to 2.5% (regardless of how low or high the RBA forecast inflation to be in year 2), and to remain there, that guarantees that

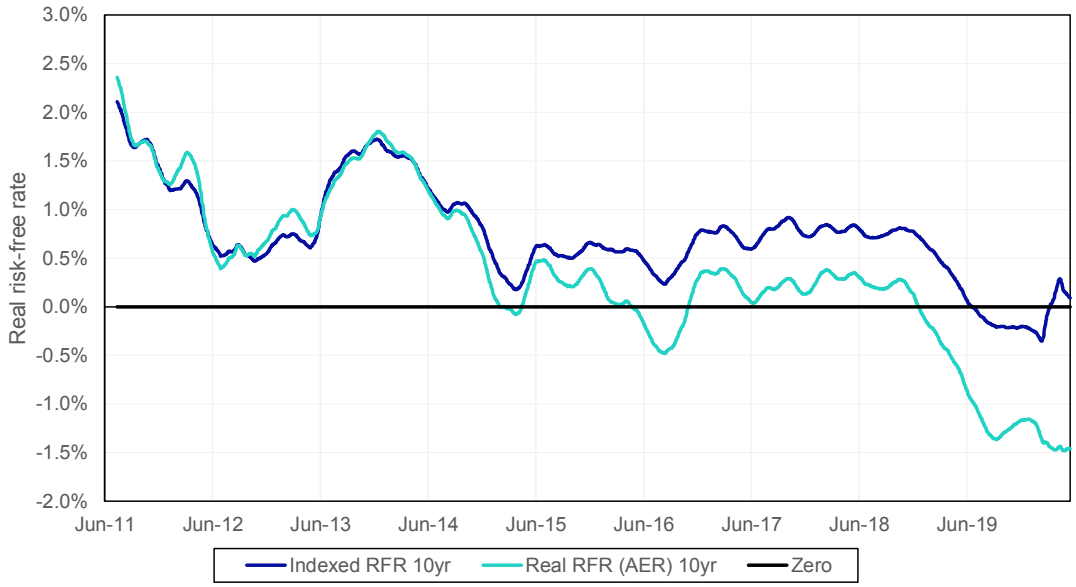
[35] The AER decided to temporarily use the RBA's trimmed mean inflation forecasts rather than headline CPI forecasts in the recent decisions due to the effect of COVID-19. The RBA forecasts were obtained from the May 2020 Statement of Monetary Policy.

the AER's methodology always produces an estimate of expected inflation very close to 2.5%.

This methodology is currently producing implausible outcomes that are inconsistent with what can be observed in actual financial markets. For instance, as Figure 6 shows:

- The AER's methodology implies that the prevailing real risk-free rate (i.e., the prevailing nominal risk-free rate, less the AER's estimate of expected inflation) is *-1.46%*; however
- The actual real risk-free rate that is observable in the market (i.e., the prevailing yield on inflation-indexed Commonwealth bonds) is *+0.09%*.

Figure 6: AER's estimate of real risk-free rate vs. actual real risk-free rate



Source: RBA data to 30 June 2020, ENA calculations. Note: Data have been smoothed over a 40-day rolling window.

That is, the real risk-free rate implied by the AER's estimates of expected inflation is currently 155 basis points lower than the actual real risk-free rate that financial investors can (and are) currently locking in using traded inflation-protected Commonwealth bonds. This disconnect between the outcomes implied by the AER's inflation methodology and the outcomes that can actually be observed in financial markets can be traced back to the AER's assumption that the rate of inflation will return to 2.5% in year 3 and remain there, irrespective of prevailing market conditions, and regardless of how high or low the RBA forecasts inflation will be in year 2.

That is, the AER is currently setting target real regulatory allowances based on a real risk-free rate of -1.46% when the observed real risk-free rate (i.e., the traded market price) is actually 155 basis points higher.

This is indicative of what Sapere (2020) have identified as an "underlying inconsistency" that "would not be consistent with the efficient investment and efficient operation of an NSP." [36]

A similar point can be made in relation to the AER's allowance for the real return on debt. The attached CEG report identifies two inflation-indexed bonds that have been issued by infrastructure businesses and demonstrates that the AER's allowed real return on debt is materially lower than the actual cost.[37] This is consistent with the AER's inflation estimate being over-stated such that its allowance for the real return on debt is understated.

5.8 Conclusions in relation to the AER approach in the prevailing market conditions

The key feature of the AER approach is the assumption that inflation is expected to be 2.5% in FY23 and every year thereafter.

However, the evidence indicates that assumption is currently unreasonable. There is simply no evidence to support the notion that inflation is expected to be 2.5% in FY23 and every following year. Indeed, there is overwhelming evidence against that proposition. Thus, the contention that 2.5% is the best available estimate of expected inflation starting as soon as FY23 is implausible, in which case alternative approaches should be considered.

5.9 The merits of inflation swap estimates

How inflation swaps work

An inflation swap is a financial instrument that is transacted between two parties. The parties agree on a fixed inflation forecast and then A agrees to make payments that reflect the fixed inflation forecast and B agrees to make payments based on actual inflation outcomes.

For example, consider an inflation swap with notional principle of $10 million and an agreed fixed rate of 2%. If actual inflation turns out to be 1.5%, A would pay an amount of $2\% \times 10\,million = \$200{,}000$ and B would pay an amount of $1.5\% \times 10\,million = \$150{,}000$. In this case, there would be a net payment of $50,000 from A to B.

By contrast, if actual inflation turns out to be 2.5%, A would still pay the fixed amount of $2\% \times 10\,million = \$200{,}000$ and B would pay an amount of $2.5\% \times 10\,million = \$250{,}000$. In this case, there would be a net payment of $50,000 from B to A.[38]

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[36] Sapere report, paragraphs 10-11.
[37] CEG report, Figure 4-1, p. 13.
[38] This is a simple illustration to identify the key features and mechanics of inflation swaps. We have abstracted from complexities such as payments being made quarterly, swaps having a duration of multiple years, the precise timing of payments, and so on in order to illustrate the key features.

Thus, if the parties set the fixed price (2% in this example) equal to what they expect inflation to be, there would be an equal chance that A would have to pay B or vice versa – it would be a 'fair' bargain.

Of course, in this example A would prefer to set the fixed rate much lower than 2% and B would prefer to set it much higher. But in order for a bargain to be struck, the fixed rate will have to be set at a level that both consider to be fair. If the fixed rate is set equal to the parties' expectation of inflation will there be an equal chance of each party gaining or losing from the bargain.

One of the main advantages of the inflation swaps estimate of expected inflation is that there is real money at stake – there is a strong financial incentive for the parties to adopt a reasonable estimate of expected inflation. The RBA has recognised this point:

> *These [market-based] measures are useful for a number of reasons. First, market participants have substantial financial resources at stake. This means that they have strong and direct incentives to form accurate expectations for inflation and, as a result, are likely to be well informed.* [39]

Indeed, the RBA notes that the majority of trading in inflation swaps involves large commercial and investment banks and superannuation funds.[40]

That is, the inflation swaps estimate of expected inflation is drawn from real market transactions between sophisticated financial institutions with real money at stake.

The relevance of an inflation risk premium

The fixed rate in an inflation swap will reflect two things:

- The market's expectation of future inflation; and
- The inflation risk premium.

The inflation risk premium depends on the covariance between the net cash flows generated by the swap and movements in the market/economy. Specifically, if one of the parties is more likely to have to make a net cash outflow during 'down' markets and receive a net cash inflow during 'up' markets, there is positive covariance (i.e., a positive beta) and that party would require a premium for bearing that risk. The Sapere report makes the same point in its Appendix I.

An inflation swap can be used to convert a nominal return into a real return. For example, an investor who currently owns a nominal bond with a nominal yield of say 5% can enter into a swap whereby the investor pays the fixed swap rate of say 2% and in return receives payments based on actual inflation outcomes. That investor now has a position that provides a real yield of 3% plus payments that reflect actual inflation. The cost of converting nominal to real is 2%, and that cost reflects the market's expectation of future inflation and the inflation risk premium.

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[39] RBA Bulletin, December 2016, Measures of inflation expectations in Australia, p. 26.
[40] RBA Bulletin, December 2016, Measures of inflation expectations in Australia, pp. 29-30.

Break-even estimates of inflation (effectively the difference between the yields on nominal and inflation-indexed government bonds) also embed the inflation risk premium. For example, a nominal government bond might yield 5% while an inflation-indexed government bond might pay a yield of 3% plus payments based on actual inflation outcomes. As for the swap above, the cost of converting nominal to real is 2% in this example, which reflects the market's expectation of future inflation and the inflation risk premium.

This raises the question of whether the market estimates are appropriate for regulatory purposes – because they reflect something other than the pure expectation of future inflation.

ENA submits that the market estimates are entirely appropriate for regulatory purposes because they exactly replicate the treatment of inflation in the regulatory model.

To see this, consider the role of the inflation parameter within the AER's regulatory framework, in relation to the return on equity. The AER first computes the required nominal return (i.e., the 5% figure in the above examples). The AER then makes a fixed deduction when setting allowed revenues in the PTRM (i.e., the 2% figure in the above examples). Then the AER adds back actual inflation via RAB indexation in the RFM. That is, the AER's inflation parameter plays the role of converting a fixed nominal return (5%) into a real return (3% plus actual inflation).

Thus, the role of the inflation parameter within the AER's framework (for the return on equity) is identical to the swap and break-even estimates. In all cases, what is required is an estimate of the price of converting a nominal return into a real one. That price reflects both expected inflation and the inflation risk premium, but there is no need to estimate each component separately because there are direct estimates of the combined price that is required available from the market data.

Section 6.3 below explains that Sapere have also reached the conclusion that the inflation risk premium is relevant and should be factored into the calculations.

The CEG report that is attached to this submission notes that, in relation to the return on equity, the AER's framework seeks to protect investors and consumers from inflation risk by delivering a real return on equity. CEG explain that:

> *The inflation risk premium applies only to nominal assets - not real assets. The current regulatory design means that the equity portion of the RAB is unambiguously a real (inflation indexed) asset. That is, the equity portion of the RAB is subject to the risks of, and requires a return consistent with, a real asset. This does not include any exposure to inflation risk and, therefore, the targeted real return should not include any inflation risk premium.*
>
> *Given that the nominal risk-free rate, estimated pursuant to the RoRI, includes both actuarially expected inflation and an inflation risk premium, it follows that the PTRM inflation should seek to remove both of these elements of inflation compensation from the nominal return on equity.*
>
> *It would be economically illogical for the PTRM to remove more/less inflation from the nominal RoE than is actually embedded in the nominal*

risk-free rate. Failing to remove any inflation risk premium will result in equity investors being compensated 'as if' they face inflation risk when the regulatory regime explicitly does the opposite (i.e. delivers a real not a nominal return). [41]

In summary, the role of the inflation parameter within the AER's framework (for the return on equity) is to convert a nominal return into a real one. What is required is an estimate of the fair price of converting a nominal return into a real one. The AER's current approach, however, does not estimate the correct price because it omits one of the components of that price – the inflation risk premium.

Bias – relative to what?

In its 2017 review of regulatory inflation, the AER considered an extensive literature documenting a 'bias' in swap and break-even estimates. However, it is important to consider the question of bias relative to what?

If the task is to estimate expected inflation, the swap and break-even estimates are indeed biased because they also include the inflation risk premium. The literature that the AER has previously considered is concerned with forecasting future inflation and estimating expected inflation.

However, if the task requires an estimate of the fair price of converting a nominal return into a real one – as is the role of the inflation parameter in the AER's framework – the market estimates are not biased. Rather, they provide a direct estimate of exactly what is required.

In this latter case, it is the AER's current approach that is biased. By omitting the inflation risk premium, the AER is using an incomplete, biased, estimate of the price that is required for its framework.

5.10 The AER's 2017 assessment of inflation swaps

Potential upward bias

In its 2017 Inflation Review, the AER provided the following reasons for applying zero weight to the evidence from inflation swaps:

The swaps method has a number of positive attributes. Estimates of expected inflation using swaps are simple to calculate, can give daily estimates and the biases are arguably smaller than the bond breakeven approach. At the conclusion of our 2017 inflation review, we did not consider the inflation swaps method produced a better inflation forecast than our current approach. The estimates produced using the inflation swaps methods are likely to incorporate biases and distortions (due to hedging costs, liquidity premium and other premiums) and these biases and distortions are likely time-varying. Additionally, the RBA stated that this method is probably unviable.[42]

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[41] CEG report, pp. 6-7.
[42] AER, May 2020, Discussion Paper: Regulatory treatment of inflation, p. 33.

The AER set out its conclusions about the directional effect and size of the potential "biases and distortions". The conclusions of the AER's analysis are summarised in Table 1 below. There are two key conclusions from the AER's analysis:

- In every case where a direction can be assigned, the bias is upward. That is, the swaps approach will, if anything, *over*-estimate expected inflation; and
- The quantum of any bias is minor, small, not significant or near zero.

Table 1: AER assessment of potential issues with inflation swaps

Potential issue	AER conclusion on direction of bias	AER conclusion on size of bias
Hedging costs	Upward	"Minor"
Inflation risk premium	Upward	n/a
Inflation indexation lag	n/a	"Small"
Counterparty default risk	Upward	"Not significant"
Liquidity premia	Upward	"Near zero"

Source: AER, December 2017, Regulatory treatment of inflation: Final position, Table 5, p. 56.

The direction of these potential biases is particularly important in the prevailing financial market conditions. At present, inflation swap prices reflect inflation expectations that are materially lower than the AER's estimate of expected inflation. ENA submits that the lower inflation swaps estimate should not be disregarded because there is some chance that it might be overstated. Rather, the existence of any upward bias increases the concerns about the AER's estimate.

A more appropriate response would be to consider why the AER's estimate is materially higher than an estimate that the AER considers to be upwardly biased. There is no basis to reject a piece of evidence because it is considered to be upwardly biased, and then to adopt an even higher figure.

'Viability' of the inflation swaps estimate

Another point raised in the above quote from the AER's 2017 Inflation Review is that the RBA has stated that the inflation swaps method is "probably unviable." That conclusion is based on the following sentence from a two-page letter to the AER:

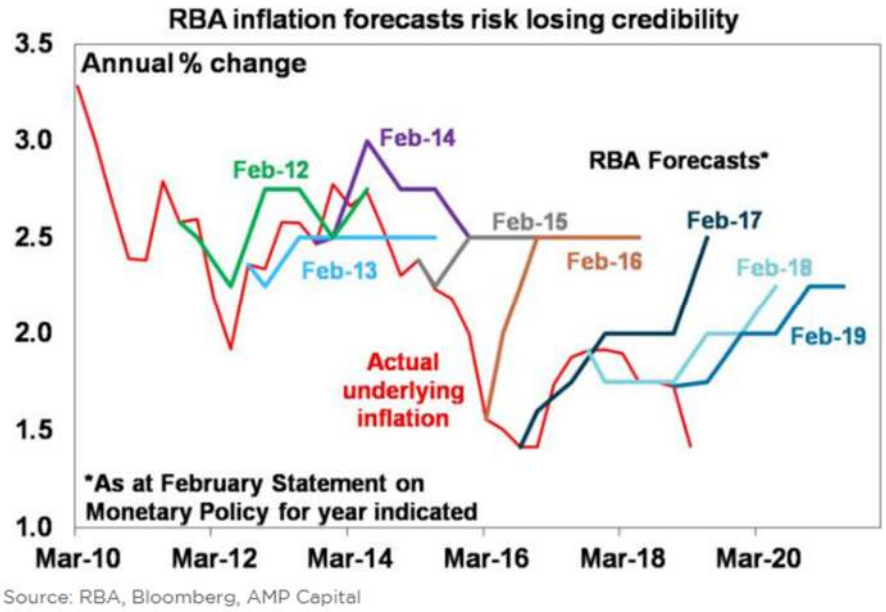
> *As noted in previous correspondence between the Bank and the AER, market-based measures of inflation expectations have several*

shortcomings that probably make them unviable alternatives to the current method. [43]

The "previous correspondence between the Bank and the AER" has not been made available to stakeholders. Thus, there is no information about what guidance the AER provided to the RBA in the previous correspondence or about what criteria the RBA considered when determining which approaches might be "viable." ENA submits that it would be improper to place weight on any conclusion where stakeholders have not had the opportunity to consider the reasons for reaching that conclusion because those reasons were set out in private "previous correspondence."

Moreover, 'viability' must be considered relative to alternative estimates. In this regard, AMP Capital has recently suggested that the RBA forecasts have been so consistently and materially biased that they "risk losing credibility," as illustrated in Figure 7 below.

Figure 7: Upward bias in RBA inflation forecasts



Source: AMP Capital; https://www.ampcapital.com/au/en/insights-hub/articles/2019/april/inflation-undershoots-in-australia-why-its-a-concern.

Trading to influence the market price

In its 2017 Inflation Review, the AER also expressed concerns about how networks might engage in trading to move the market if the AER were to place weight on inflation swaps estimates:

[43] Letter from the RBA to the AER, 5 July 2017. https://www.aer.gov.au/system/files/Letter%20from%20the%20AER%20to%20the%20RBA%20-%209%20June%202017.pdf.

Focusing on the use of the swaps method in the regulatory framework, we have concerns with the ability of stakeholders to move the market in short averaging periods. Such ability is a concern due to the impact of expected inflation on revenue outcomes for service providers. [44]

The AER's concern appears to be that networks may enter the market and trade inflation swaps in order to cause the AER to adopt a lower inflation forecast. This is because the gains from a lower regulatory inflation figure would more than offset the expected losses from selling inflation swaps at below what would otherwise be market prices. The ENA makes the following observations about this concern:

- It would be open to the AER to reject the inflation swaps evidence, or indeed any evidence, if there was any indication of that evidence having been tampered with in some way (this seems highly improbable – particularly for financial market data); and
- The inflation swaps market can only be moved at a financial cost – trading at below-market prices results in an expected loss. By contrast, survey responses involve no cost at all. For example, a respondent who would benefit, or whose clients or customers would benefit, from a higher inflation forecast can simply announce that higher forecast without incurring any cost at all.
- There is a fundamental limit to which trading of CPI swaps can move the market price. If the market price of a CPI swap is materially depressed relative to a fair price investment banks and others can profit from arbitrage
- ENA submits that a 40-day average should be adopted, commensurate with the averaging approach adopted when market prices are used to estimate other parameters. Any attempt to move the market over such a time period would be costly to a network. It seems unlikely that a network would have the capacity to materially move the market over such a period.
- Nonetheless, if further analysis suggested that a concern remained, the ENA would be open to supporting other arrangements to eliminate any risk.

5.11 The break-even inflation estimate

The break-even approach also has the merit of being based on observed market prices of traded securities – in this case government bonds. Like inflation swaps, the break-even estimate reflects the inflation expectations of real-world market participants where real money is at stake. The break-even approach has the added advantage of being based on the same government bond yields that are used elsewhere in the AER's regulatory process. For these reasons, the break-even approach has been adopted by a number of regulators including the ERA of WA and the ESC in Victoria.

[44] AER, December 2017, Regulatory treatment of inflation: Final position, p. 55.

Another advantage of the break-even approach is that the estimate embeds the inflation risk premium, consistent with the role of the inflation parameter in the AER's models.

One potential disadvantage of the break-even approach is that the estimate may be affected by a liquidity premium. In this case, there are two potential courses of action:

- Make an appropriate (or even conservative) adjustment for the liquidity premium; or
- Have no regard whatsoever to the information contained in real and nominal government bond prices.

ENA submits that the former approach is appropriate – particularly given the AER's use of government bond yields elsewhere in its regulatory framework.

In this regard, ENA notes that the Queensland Treasury Corporation (QTC) submission to this review sets out an approach for deriving an upper bound for the liquidity premium. This upper bound can be deducted from the inflation-indexed government bond yield to produce an 'adjusted' real yield to be used to estimate break-even inflation. The resulting adjusted break-even estimate will be conservatively high in that it is based on the highest reasonable estimate of the liquidity premium.

ENA endorses the QTC approach for deriving the adjusted break-even estimate and submits that this is relevant evidence to which the AER should have regard when estimating expected inflation.

The adjusted break-even estimate:

- Removes the effect of any liquidity premium in a conservative manner (i.e. in favour of lower regulatory allowances); and
- Like swaps estimates, it reflects the market cost of converting a fixed nominal return into a fixed real return.

Thus, the adjusted break-even estimate is commensurate with the role that the inflation parameter plays within the AER's regulatory framework.

5.12 A glidepath estimate

ENA shares the concerns that have previously been raised in relation to a glidepath approach. The start and end points of any glidepath are inevitably arbitrary and should not be fixed across all market conditions. For example, it would be reasonable to have a much longer glidepath in the current market conditions when inflation is at very low levels than if recent inflation had been, say, 2.3% over the past few years.

But rather than impose some unnecessarily arbitrary constraints, the better, and simpler, approach would be for the AER to determine an estimate of expected inflation having regard to all of the relevant evidence.

5.13 Conclusions in relation to the best regulatory estimate of inflation

ENA submits that:

- There is a compelling case for altering the AER's current approach in the prevailing market conditions:
  - The key feature of the AER approach is the assumption that inflation is expected to be 2.5% in FY23 and every year thereafter. Every piece of available evidence indicates that assumption is currently unreasonable.
  - Sapere have advised the AER that its current approach to estimating expected inflation is inconsistent with its approach to estimating the nominal required return and that the "underlying inconsistency" would "not be consistent with the efficient investment and efficient operation of an NSP." [45]
- The market estimates (inflation swaps and the adjusted breakeven approach) provide the most direct estimate of inflation for regulatory purposes:
  - The market approaches provide direct estimates that are commensurate with the role that the inflation parameter plays within the AER's regulatory framework. They indicate the market price of converting fixed nominal returns into fixed real returns, which is precisely the role of the inflation parameter in the AER's framework.
  - Market prices are set by sophisticated market participants in trades where there is real money at stake. This is the basis for the AER's use of market prices to inform other parameters.
  - Any remaining bias is either small (according to the AER's own analysis) or conservative in favour of lower regulatory allowances, or both.
- For clarity, ENA does not submit that the AER should always adopt one or other of the market estimates in a mechanical way. ENA acknowledges that the best possible estimate of any parameter will involve proper consideration of all of the relevant evidence, rather than select one method to the exclusion of all other relevant evidence.
- Rather, ENA submits that it is not possible to obtain the best estimate of expected inflation for use in the AER's framework without giving material weight, or at least some weight, to the market evidence – as do a number of other regulators.

5.14 Proposed approach and implementation

ENA submits that there is no need for the AER to select one single method to the exclusion of all other relevant evidence when determining the regulatory inflation figure. Regard should be had to all relevant evidence, in light of the relative strengths and weaknesses.

ENA submits that, in the prevailing market conditions, market evidence should receive material weight because that evidence:

[45] Sapere report, paragraphs 10-11.

- Is perfectly consistent with the role that the inflation parameter plays in the AER's framework;
- Is consistent with the AER's reliance on market data when estimating other parameters;
- Is based on observed market prices set in financial markets, reflecting market outcomes where real money is at stake; and
- Is used by other regulators for the reasons set out above.

ENA further submits that, in the prevailing market conditions, the RBA policy target of 2.5% would receive little weight, at least over the short and medium term because:

- It is a policy objective, not an expectation; and
- There is strong evidence to suggest that inflation is highly unlikely to return to 2.5% in the short or medium term.

There would be no role for any glidepath approach here because that approach is not a source of any evidence, but rather a way of constraining (in a formulaic way) the process by which the relevant evidence is converted into annual inflation figures.

As set out above, the AER would require:

- An estimate of 5-year expected inflation, or annual estimates of expected inflation for each regulatory year, in relation to the return on debt; and
- An estimate of 10-year expected inflation in relation to the return on equity.

6 The Sapere report

The key findings of the Sapere report are:

- The AER's regulatory approach does deliver the AER's target real return.
- However, if the AER's estimate of expected inflation differs from the market's true estimate, the AER's framework will deliver the wrong real return.
- Moreover, if the benchmark efficient return on debt is taken to be a nominal return, the AER's framework will deliver the wrong real return to equity holders in any period where actual inflation turns out to differ from the AER's forecast.
- Also, the AER's target real return is the wrong target because the AER's estimate is not consistent with the role of the inflation parameter within the AER's framework. Specifically, the AER's target real return is based on actuarial expected inflation, whereas the AER's framework requires an estimate of the cost of converting fixed nominal returns into fixed real returns.
- Sapere's analysis considers a version of a hybrid approach, however, it does not consider the hybrid approach that is advocated by this submission.
- Although Sapere were instructed not to comment on the specific merits of the AER's estimates of the nominal required return or expected inflation, Sapere do identify an "underlying inconsistency" in those estimates that is inconsistent with "the efficient investment and efficient operation of an NSP."

6.1 Delivery of a real return

The key finding of the Sapere report is that the AER's regulatory approach delivers the AER's estimate of the real return on capital. This is obvious from the fact that the AER's approach is to:

- Provide the AER's estimate of the real return via allowed revenues (by subtracting the AER's estimate of expected inflation from the AER's estimate of the required nominal return); and
- Provide an allowance for actual inflation via RAB indexation.

ENA does not dispute that the AER's regulatory approach delivers the AER's estimate of the real return on capital. However, ENA considers that there are three problems with that approach, which are addressed in turn below.

If the AER's estimate of expected inflation differs from the market's true estimate, the AER's framework will deliver the wrong real return

The AER's approach will deliver the wrong real return if the AER's estimate of expected inflation differs from the market's estimate. That is, the AER's framework does not somehow correct over time for mis-estimation of expected inflation.

For example, if the AER over-estimates expected inflation for a particular regulatory period, its approach will deliver a real return below that actually required by the market.

Although this proposition is intuitively clear, the Appendix to this report establishes the point using Sapere's mathematical framework.

The regulatory framework should not deliver a target real return on debt

As established in Section 4 of this report, the benchmark efficient entity should be taken to issue nominal debt. In this case, the prudent and efficient cost of debt is a nominal cost. Consequently, allowed revenues should be commensurate with that nominal cost, not some real cost that does not reflect the prudent and efficient cost.

Sapere's mathematical analysis shows that, if the benchmark efficient return on debt is taken to be a nominal return, the AER's framework will deliver the wrong real return to equity holders. This is because the regulatory allowance will differ from the efficient cost of debt and any differential will flow through to equity holders.

The regulatory framework should incorporate the inflation risk premium in relation to the allowed return on equity

Section 5 above establishes that the AER's regulatory framework effectively embeds a 'pay fixed, receive floating' inflation swap position. In an inflation swap, the fixed rate represents the market's expectation of inflation plus the inflation risk premium. That fixed rate is what the market is prepared to pay in order to convert a fixed nominal return into a fixed real return, which is precisely what the AER's framework does in relation to the allowed return on equity. This point is explained in more detail in Section 6.3 below.

6.2 The NPV=0 principle

The Sapere report evaluates the AER's current approach in terms of the NPV=0 principle – the idea that regulatory allowances should be set so that their present value equals the current RAB.

> *If the present value of regulated revenue is set to equal the present value of costs (including a return on capital), then consumers pay no more than is required to attract the investment needed to efficiently provide the service. Hence, regulation that seeks to set the present value of revenue equal to the present value of costs is in the long-term interests of consumers.*[46]

Sapere conclude that the AER's current approach satisfies the NPV=0 principle, assuming that the AER always adopts an appropriate (or at least unbiased) estimate of expected inflation.

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[46] Sapere report, Paragraph 4.

ENA agrees with that conclusion. However, Sapere does not address the key point that there are many different approaches that satisfy the NPV=0 principle. For example, ENA's proposed approach of setting the regulatory allowance equal to the efficient cost in every regulatory period also satisfies the NPV=0 principle. Thus, the real question is: which is the best approach among those that satisfy the NPV=0 principle (and best contribute to achieving the NEO and NGO)? In particular:

- The ENA's proposed approach of setting the regulatory allowance equal to the efficient cost in every regulatory period satisfies the NPV=0 principle; and
- The AER's current approach of setting the regulatory allowance equal to the efficient cost plus a random differential also satisfies the NPV=0 principle.

To satisfy the NPV=0 principle, the regulatory allowance must match the efficient cost over the life of the assets. The AER's current approach satisfies this requirement because it over-compensates in some regulatory periods and under-compensates in other regulatory periods such that these errors will tend to cancel each other out in the long-run (so long as the AER adopts unbiased estimates of expected inflation).

ENA submits that the best way of satisfying the NPV=0 principle, and achieving the NEO and NGO, is to set the regulatory allowance equal to the efficient cost in every regulatory period because:

- This ensures that every generation of consumers pays the efficient cost, rather than some consumers over-paying and others under-paying;
- This also ensures that every generation of equity holders is appropriately compensated, rather than some being over-compensated and others being under-compensated;
- It supports a network's credit metrics in every year rather than only on average over the long-run; and
- It creates appropriate investment incentives, rather than incentivising over-investment during some periods and under-investment during other periods.

However, Sapere have not provided any reason why an approach of setting regulatory allowances that differ from the benchmark efficient approach of issuing nominal debt best supports the NEO and NGO.

6.3 The role of the inflation risk premium

Section 5 above establishes that, in relation to the required return on equity, the AER's regulatory framework is designed to turn a fixed nominal return into a fixed real return. The nominal return is composed of the real return, expected inflation, and the inflation risk premium. Thus, to convert nominal to fixed, requires the removal of expected inflation and the inflation risk premium.

To date, the AER has taken a different view, concluding that it should deduct only expected inflation. Indeed, the AER has pointed to the fact that the inflation swap rate includes the inflation risk premium as a reason for rejecting that approach.

The Sapere report is clear about the fact that the inflation risk premium should be included. In this regard, Sapere state:

> *The method of estimating the nominal WACC and the AER's approach to estimating inflation are out of scope for this report and are taken as given. However, it should be noted that the SLM-CAPM does not address uncertain inflation, which results in the nominally risk-free asset having a risky real rate of return. The CAPM with uncertain inflation is derived in Appendix I. The impact on the estimate of the return on equity compared with an estimate resulting from application of the SLM-CAPM depends on currently unavailable empirical estimates of the covariance between inflation and the return on equity and the covariance between inflation and the returns on the market portfolio.*[47]

In Appendix I to its report, Sapere establishes that the conversion from nominal to real requires the removal of expected inflation and the inflation risk premium.

In particular, Equation (2) and Paragraph 192 of the Sapere report establish that:

$$\overline{r_z} = \overline{R_F} - \bar{\pi} - \beta'_F(\overline{r_m} - \overline{r_z})$$

where:

- $\overline{r_z}$ represents the real risk-free rate (Sapere refer to this as the real return on a zero-beta portfolio);
- $\overline{R_F}$ represents the nominal risk-free rate;
- $\bar{\pi}$ represents expected inflation; and
- $\beta'_F(\overline{r_m} - \overline{r_z})$ represents the inflation risk premium.[48]

CEG make the same point in the report attached to this submission, converting the Sapere formula to words:

$$\textit{True real RFR} \quad = \quad \textit{Nominal RFR} \quad - \quad \textit{E(infl.)} \quad - \quad \textit{IRP.}$$

6.4 Identification of an "underlying inconsistency" in the AER's allowances

Although Sapere were instructed not to comment on the specific merits of the AER's estimates of the nominal required return or expected inflation,[49] Sapere does note that there appears to be an "underlying inconsistency." The nature of this inconsistency is that the AER's estimate of expected inflation appears to be too high, relative to the AER's allowed nominal return on equity.

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[47] Sapere report, Paragraph 81.

[48] We note that the formula for β'_F in Paragraph 192 of the Sapere report is incorrect, but that has no bearing on the analysis set out here.

[49] Sapere report, paragraph 81

The outworking of this underlying inconsistency is that the AER's current regulatory allowances place networks in a loss-making position that is clearly unsustainable.

Sapere conclude that the current regulatory allowances are inconsistent with the efficient investment and efficient operation of an NSP:

> *…we note that the **sustained fall in inflation expectations** mean that the parameter estimates determined recently by the AER imply a negative cashflow return on equity for a benchmark efficient entity. An assumption that the benchmark efficient entity would fund dividends (and growth) from depreciation cashflows—that is, spending less on replacement of real capital—**would not be consistent with the efficient investment and efficient operation of an NSP**, at least beyond the short-term. Borrowing to pay dividends may be justified by the higher increase in the RAB (than would be expected with a positive cash rate of return on equity) and consequential increase in revenue, though may alter the cash payment profile for consumers.*
>
> *We suggest that the AER consider, during its 2020 Inflation Review, whether a projected negative cash return on equity might indicate **an underlying inconsistency** in one or more inputs into its estimate of WACC and expected inflation. Some possible aspects to explore might include:*
>
> - *whether the estimate of expected inflation is too high and thus causes the negative cash rate of return on equity*
> - *whether the nominal cost of equity might be under-estimated relative to the estimated expected inflation*
> - *whether the assumed capital structure is efficient, given the relative rates of return to equity and debt.* [50]

The first two points that Sapere raise highlight the apparent inconsistency between the AER's current allowed nominal return on equity and its current estimate of expected inflation. The AER's allowed nominal return on equity is computed by adding a constant risk premium to the prevailing nominal government bond yield. According to the AER's current approach, the nominal government bond yield is approximately 0.8%, of which 2.3% is compensation for expected inflation. This implies a real government bond yield of -1.5%. However, as shown in Figure 6 above, the actual real government bond yield is currently some 155 basis points higher than that.

That is, the "underlying inconsistency" that Sapere have identified is made clear by the fact that the AER is current setting regulatory allowances on the basis that the real risk-free rate is -1.5% when the actual rate, available to investors in the real world, is more than 150 basis points higher.

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[50] Sapere report, paragraphs 10-11, emphasis added.

Sapere note that "the sustained fall in inflation expectations mean that the parameter estimates determined recently by the AER imply a negative cashflow return on equity for a benchmark efficient entity." [51]

It is important that, during the course of this review, the AER address the 'underlying inconsistency' point raised by its own consultant and by ENA.

Sapere also raise a point about the AER's estimate of the benchmark efficient gearing level. However, it would make little sense for the AER to change its benchmark gearing assumption as some sort of indirect 'fix' of the inconsistency that Sapere have identified. The AER has set benchmark gearing to 60% in every decision it has issued. This is based on empirical evidence of the actual practice of networks and other infrastructure businesses. The benchmark gearing assumption should not be altered by departing from the empirical evidence as an indirect way of addressing a clear inconsistency between the AER's allowed return on equity and estimate of expected inflation.

6.5 The key findings of the Sapere report

In summary, the key findings of the Sapere report are that:

- The AER's regulatory approach does deliver the AER's target real return.
- If the AER's estimate of expected inflation differs from the market's true estimate, the AER's framework will deliver the wrong real return.
- If the benchmark efficient return on debt is taken to be a nominal return, the AER's framework will deliver the wrong real return to equity holders in any period where actual inflation turns out to differ from the AER's forecast.
- The AER's target return is the wrong target because the AER's estimate is not consistent with the role of the inflation parameter within the AER's framework. Specifically, the AER's target real return is based on actuarial expected inflation, whereas the AER's framework requires an estimate of the cost of converting fixed nominal returns into fixed real returns.
- Although Sapere were instructed not to comment on the specific merits of the AER's estimates of the nominal required return or expected inflation, Sapere does identify an "underlying inconsistency" in those estimates that is inconsistent with "the efficient investment and efficient operation of an NSP."

6.6 Questions posed to Sapere

ENA submits that it would be useful for all stakeholders, and especially for the AER, if Sapere were to respond to the following questions:

1. Can Sapere confirm that, if the AER's estimate of expected inflation differs from the market's true estimate, the AER's framework will deliver the wrong real return?

[51] Sapere report, paragraphs 10-11.

2. Can Sapere confirm that, if the benchmark efficient return on debt is taken to be a nominal return, the AER's framework will deliver the wrong real return to equity holders in any period where actual inflation turns out to differ from the AER's forecast?
3. Does Sapere agree that, for the return on equity, the appropriate deduction to be made in the PTRM is the cost of converting a fixed nominal return into a fixed real return (akin to an inflation swap) rather than an unbiased estimate of expected inflation?
4. Is Sapere of the view that, among the approaches that satisfy the NPV=0 principle, the best approach is that which sets the regulatory allowance equal to the efficient cost in every regulatory period?
5. Can Sapere confirm that the formula for β_F' in paragraph 192 is incorrect?

7 The Deloitte Access Economics report

- ENA submits that the DAE report should receive no weight because it is based on dated and irrelevant evidence, is unclear about where to draw the line between the AER's instructions and DAE's own opinions, and presents conclusions about inflation expectations that are materially inconsistent with DAE's own published opinions in other settings.
- Significant problems with the DAE report include:
  - DAE concludes that RBA forecasts perform well, based on studies that pre-date the AER's 2017 inflation review. No consideration is given to the consistently and materially poor performance of RBA forecasts over recent years. However, it is recent evidence that forms the basis of the current review.
  - DAE conclude that there is no 'de-anchoring' of inflation swaps estimates, justifying that conclusion in relation to international evidence during the 2014 European debt crisis. DAE has no regard to the current evidence in Australia which demonstrates a material de-anchoring of inflation swaps estimate (all forecasts are below 2% for the next decade).
  - While DAE considers 'de-anchoring' from the RBA target band of 2-3%, that does not reflect the AER's approach. The relevant question is whether there has been a 'de-anchoring' from the AER's approach of assuming inflation of 2.5% in Years 3 to 10.
  - The DAE report does not opine on the appropriateness of the criteria that were provided to it by the AER. Nor does DAE address, the strong criticisms of the AER's criteria that were made as part of the 2017 Inflation Review.
  - DAE does not opine on whether it considers the AER's approach to materially over-estimate expected inflation in the prevailing market conditions. It is apparent that the DAE view is that the AER's approach does materially over-estimate expected inflation in the prevailing market conditions, but that was not disclosed in the current report.

7.1 What was DAE asked to do?

The DAE report does not set out any formal instructions provided by the AER.

However, the central task performed by DAE is set out as follows:

> *This review includes Deloitte Access Economics' assessment of whether the AER's current approach, or an alternate approach, derives the best estimate of expected inflation in relation to its congruence with market expectations*

appropriateness in the context of applicable National Energy Rules and the National Gas Rule requirements.[52]

In relation to this description of the task:

- ENA understands DAE to mean the *National Electricity Rules* rather than the National Energy Rules; and
- ENA is unfamiliar with the term "market expectations appropriateness," but takes this to mean that the DAE conclusions are based primarily on the AER's 'Relative Congruence' criterion.

From the context of the report it seems that DAE was asked to:

- Consider a number of inflation estimation methodologies provided to it by the AER;
- Assess those methodologies against a set of criteria provided to it by the AER; and
- Identify which single method ranks highest according to the criteria provided by the AER.

The same exercise was performed by the AER as part of its 2017 Inflation Review. In that case, the AER concluded that its own method ranked highest according to its own criteria.

DAE reaches the same conclusion after evaluating the same methods against the same criteria.

7.2 What was DAE not asked to do?

No consideration of appropriateness of criteria

The DAE report does not opine on the appropriateness of the criteria that were provided to it by the AER.

Nor does DAE address, or even indicate awareness of, the strong criticisms of the AER's criteria that were made as part of the 2017 Inflation Review. For example:

- Submissions identified that the "relative congruence" criterion involves circular reasoning in that it ranks approaches for estimating the 10-year market expectation of inflation according to how closely each aligns with the 10-year market expectation of inflation:
  - But if we knew the 10-year market expectation of inflation, so we could determine how well each approach aligns with it, we would not need any of those approaches because we would already know the thing we're trying to estimate.

[52] DAE report, p. 6.

- And if we don't already know the 10-year market expectation of inflation, we can't possibly know how well each approach aligns with it.[53]

- The CEPA report attached to the ENA submission proposed that:
  - The estimate of inflation should be congruent with its role in the regulatory framework – it should reflect expectations priced into financial securities; and
  - An approach should not be marked down for not being relatively simple if it is transparent and replicable.[54]

We further consider the criteria used by DAE in the following sub-section.

No consideration of whether the AER approach materially overstates expected inflation in the prevailing market conditions

It also seems clear from the context of the report that DAE was not asked to, or was instructed not to, opine on whether it considers the AER's approach to materially over-estimate expected inflation in the prevailing market conditions.

It is apparent that the DAE view is that the AER's approach does materially over-estimate expected inflation in the prevailing market conditions, but it was not deemed relevant to disclose that in the current report.

For example, DAE provided forecasts of inflation for the AER's decisions for SAPN, Energex and Ergon in March 2020. Forecasts were provided through to FY25, with every forecast being materially below 2.5%.[55]

Since March 2020 inflation forecasts have been revised down uniformly (other than the AER's estimate of 2.5% for FY23 and beyond).

DAE has recently stated that the Covid-19 crisis:

> *Drops us into low inflation **for the next decade**.*[56]

And DAE's most recent *Business Outlook* states that:

> *Australia and the world are 'printing money' hand over fist. But **the very last thing you need to worry about is any lift in inflation**. Demand is dead as a doornail, and wage gains – already weak – are set to fade further. Globally*

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53 https://www.aer.gov.au/system/files/SAPN%2C%20CitiPower%2C%20Powercor%20and%20AGN%20joint%20submission%20on%20regulatory%20treatment%20of%20inflation%20%2029%20June%202017.PDF.

54 https://www.aer.gov.au/system/files/ENA%20submission%20on%20regulatory%20treatment%20of %20inflation%20-%20Attachment%20A%20-%2028%20June%202017.PDF.

55 https://www.aer.gov.au/system/files/Deloitte%20Access%20Economics%20-%20Labour%20Price% 20Growth%20Forecasts%20prepared%20for%20the%20AER%20-%2020%20March %202020_0.pdf.

56 https://www.abc.net.au/news/2020-05-11/economic-cure-post-coronavirus-is-tax-reform/12227760, emphasis added.

and locally, interest rates will be nailed to the floor for years. That's because (1) this is a big recession, (2) ***inflation is as dead as a door nail****…*[57]

It is difficult to reconcile DAE's conclusions in support of the AER's approach to inflation with DAE's own *Business Outlook* forecasts.

It is clear that DAE's current view is that the AER approach very materially overstates expected inflation in the prevailing market conditions.

7.3 Problems with DAE's analysis and conclusions

Problem 1: Studies are out of date

The AER conducted a review of its approach to inflation in 2017 and concluded that its current approach was the best available approach at that time. The reason for the current review is that the problems that were identified in 2017 have continued and magnified. The current review is being conducted to determine whether the AER's current approach provides an appropriate estimate in the prevailing market conditions.

Within this context, it is difficult to see how studies that pre-dated the 2017 review by several years can be of any assistance in the current process.

For example, DAE cites two studies in 2012 and 2013 in support of the proposition that the RBA forecasts outperform some private forecasts and a random walk model.[58]

But the problem that has been identified, and the reason for the current review, relates to forecasts in the prevailing market conditions – not the average market conditions over a period that finished almost a decade ago.

Pointedly, the DAE report does not consider the performance of RBA forecasts over recent years. That performance provides no reason to have any confidence at all in RBA forecasts in the prevailing market conditions. Figure 6 above shows that, not only have the RBA forecasts diverged very materially from actual inflation outcomes, those forecasts have been consistently biased in one direction. This has led market participants to question whether the RBA forecasts are at risk of "losing credibility."[59]

Despite this evidence of material problems in the prevailing market conditions, the DAE report concludes favourably about RBA forecasts without considering the prevailing market conditions.

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[57] https://www2.deloitte.com/au/en/pages/media-releases/articles/business-outlook.html, emphasis added.
[58] DAE report, p. 21.
[59] https://www.ampcapital.com/au/en/insights-hub/articles/2019/april/inflation-undershoots-in-australia-why-its-a-concern.

Problem 2: No consideration of whose expectations should be estimated

As with every parameter, the "best estimate of expected inflation" is one that is consistent with its role in the regulatory framework. Consequently, one needs to consider how the parameter is used in the regulatory framework and then adopt an estimate that is consistent with that role.

We have noted throughout this report that the AER's regulatory framework deducts expected inflation when setting allowed revenues in the PTRM and adds back actual inflation when indexing the RAB in the RFM. The purpose of these steps is to convert a fixed nominal return into a fixed real return. Thus, the appropriate figure to be deducted in the PTRM is the fair price that would have to be paid to convert a fixed nominal return into a fixed real return. That figure, and only that figure, ensures that:

- Equity holders are (just) made whole; and
- Consumers pay only the efficient cost.

As discussed in Section 5.9 above, market data provides a direct estimate of the fair price that would have to be paid to convert a fixed nominal return into a fixed real return. That is, the 10-year inflation figure that can be observed in a 10-year inflation swap or via 10-year breakeven estimates is directly consistent with the use of that figure in the regulatory framework. By contrast, the AER approach produces a figure that differs from the price that would have to be paid to convert a fixed nominal return into a fixed real return.

The DAE report does not consider which approaches are congruent with the role of the inflation figure within the regulatory framework.

Problem 3: No recognition that the AER approach is not an expectation at all

The AER approach is a mixture of RBA forecasts for two years and RBA policy objectives for eight years. Thus, that 'estimate' does not reflect an expectation, but rather a policy objective.

By way of analogy, the Brisbane Broncos' objective is to win their game against the Melbourne Storm this weekend, but no one seriously expects that to happen. Similarly, the RBA has a stated policy objective of returning inflation to 2.5%, but nobody really expects that to happen for many years. Certainly no one (including DAE) expects that to happen as soon as FY23, as the AER's method assumes.

It is difficult to see how the AER approach can represent the best estimate of expected inflation (as required by the Rules) when it is not an expectation or an estimate at all, but rather a policy objective that no one really believes has any chance of being met in the time frame that the AER assumes.

On this point, Ofgem has recently observed that:

> *While using the Bank of England inflation target of 2% has the benefit of simplicity we have concerns that it is also not a measure of expected*

inflation (it is a target but may not represent market participants' expectations.)[60]

Problem 4: Flawed analysis of 'de-anchoring'

The DAE report considers whether inflation expectations might have de-anchored from the RBA target band of 2-3%. DAE does not define what it means by "de-anchoring" but it is presumably a test of whether there is evidence of inflation expectations moving outside the RBA target band.

Whereas DAE considers 'de-anchoring' from the RBA target band of 2-3%, that does not reflect the AER's approach. The relevant question is whether there has been a 'de-anchoring' from the AER's approach of assuming inflation of 2.5% in Years 3 to 10.

It would be useful for DAE to provide a more precise definition of what it considers 'de-anchoring' to mean. By how much and for how long would an estimate have to be below the target rate or target band to be considered to have de-anchored?

ENA submits that the appropriate test is whether or not there is evidence that inflation expectations have diverged from the AER's assumed values in the prevailing market conditions. If they have, it would follow that the AER's current approach does not produce the best possible estimate of inflation and does not satisfy the Rules. In particular, the question is whether there is evidence that inflation expectations have currently diverged from the AER's assumption that inflation is expected to be 2.5% in FY23 and every year thereafter. In this regard, there seems to be clear evidence that:

- Market expectations (from inflation swaps and the break-even method) have materially de-anchored from the AER's inflation assumptions for all ten years of the forecast horizon;
- All expectations from every source have de-anchored from the AER's inflation assumptions for at least the first five years of the forecast horizon; and
- DAE itself has de-anchored from the AER's inflation assumptions as noted above.

Rather than consider whether current Australian inflation forecasts have diverged from the AER's inflation assumptions, DAE instead reviews international evidence of whether expectations at a different time and in a different place had diverged from a different inflation target. This includes evidence of whether long-term survey forecasts might have diverged from inflation targets in various countries and whether market-based approaches might have diverged from targets during the 2014 European debt crisis.

DAE does concede that:

> *...there remain significant limitations in the current academic literature. Most notably, there are few studies that examine inflation expectations in 2019 and 2020 – the period in which some measures of Australian inflation expectations have shown signs of movement. The most recent*

[60] https://www.ofgem.gov.uk/system/files/docs/2020/07/draft_determinations_-_finance.pdf, paragraph 2.75.

studies on inflation expectations also focus on countries other than Australia and tend to analyse data over several years (which may cloud potential insights into recent changes in inflation expectations). [61]

However, DAE feels that its analysis supports the unambiguous conclusion that:

As such, there is little evidence to suggest that Australian inflation expectations have become de-anchored from the RBA's target range of 2-3%.[62]

ENA submits that this conclusion has no basis. It is unclear why DAE consider evidence from European inflation swaps from six years ago and has ignored the current evidence from Australian inflation swaps? The current Australian swaps data shows a clear de-anchoring, as illustrated in Figure 2 above, but DAE has not considered that evidence.

ENA notes that the issue of 'de-anchoring' was also considered in the Vahey (2017) report[63] commissioned by the AER. Professor Vahey concludes that:

Overall a loss of credibility by an independent RBA only seems plausible if interest rates are very low (i.e. near zero) and Australia faces prolonged deflationary pressure.[64]

In this regard, ENA notes that DAE has stated that:

interest rates will be nailed to the floor for years[65]

and that:

inflation is as dead as a door nail.[66]

Problem 5: Use of circular ranking criteria

The leading criterion by which the various estimation methods are ranked is referred to as "relative congruence". DAE adopts the following definition:

Relative congruence refers to how closely the chosen approach aligns with 10-year market expectations of inflation.[67]

But recall that DAE has stated that the objective of the exercise is to determine the best estimate of the 10-year market expectation of inflation.

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[61] DAE report, pp. 31-32.
[62] DAE report, p. 31.
[63] https://www.aer.gov.au/system/files/Prof%20Shaun%20P%20Vahey%20-%20Report%20to%20the% 20AER%20on%20estimating%20expected%20inflation%20-%2015%20September%202017.PDF.
[64] Vahey (2017), p. 10.
[65] DAE Business Outlook, July 3 2020, https://www2.deloitte.com/au/en/pages/media-releases/articles/ business-outlook.html.
[66] DAE Business Outlook, July 3 2020, https://www2.deloitte.com/au/en/pages/media-releases/articles/ business-outlook.html.
[67] DAE report, p. 33.

Thus, the process involves determining which estimate of the 10-year market expectation of inflation most closely aligns with the (unobservable) 10-year market expectation of inflation.

However, this is entirely circular as explained in Section 7.2 above.

The Vahey (2017) report notes that the swaps and break-even approaches rank highly on the "congruence" criteria because they are based on traded market prices. In relation to inflation swaps:

> *Using market information to assess inflation expectations offers a route to produce a measure congruent with the market-expected inflation.*[68]

And in relation to the break-even approach:

> *As with the swaps route, the idea appeals because expectations are derived from market prices – in this case of nominal and inflation-indexed government securities – so that the method is conceptually closer to the "market-expected inflation" rate, than say, survey expectations.*[69]

Problem 6: Implausible estimates rank highly on some criteria

DAE concludes that:

> *The current AER approach is highly robust, transparent, replicable and simple.*[70]

But the approach of always setting inflation to any constant figure (e.g. 10%) would also be "highly robust, transparent, replicable and simple" according to the definitions of those criteria.

As noted above, DAE makes no comment about the appropriateness of the criteria the AER provided to them.

Like the DAE report, Vahey (2017) concludes that the AER approach of adopting a fixed 2.5% figure in all market conditions is robust, transparent, replicable and simple – as defined by the AER.

Problem 7: Mis-ranking based on exclusion of inflation risk premium

Sections 5 and 6.3 above, and the Sapere report, all establish that, in relation to the required return on equity, the AER's regulatory framework is designed to turn a fixed nominal return into a fixed real return. The nominal return is composed of the real return, expected inflation, and the inflation risk premium. Thus, to convert nominal to fixed, requires the removal of expected inflation and the inflation risk premium.

However, when DAE compiles ratings for the 'relative congruence' criterion, approaches are marked up if they omit the inflation risk premium and marked down if

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[68] Vahey (2017), p. 11.
[69] Vahey (2017), p. 11.
[70] DAE report, p. 7.

they include it. This is exactly the wrong way around – it is inconsistent with the role that the inflation parameter plays within the AER's framework. Thus, the 'relative congruence' ratings should be reversed.

Problem 8: Double counting of perceived weaknesses of market evidence

DAE appears to double-count the perceived weaknesses of market evidence. For example, in relation to the break-even approach:

- DAE reduces the relative congruence ranking due to the presence of embedded premia, biases and other distortions; and
- DAE reduces the simplicity ranking due to the need to make adjustments to account for embedded premia, biases and distortions.

It does not seem possible that the biases can be simultaneously accounted for (lowering the "simplicity" ranking) and not accounted for (lowering the "relative congruence" ranking).

Problem 9: No basis for some rankings

There appears to be no basis for some of the rankings in the key table in the DAE report. For example, the swaps estimate is given only a "fair" ranking in terms of simplicity on the basis that it is less complex than the break-even method but more complex than other methods.

However, that approach involves simply obtaining the current "AUSWIT10 Curncy" figure from Bloomberg, which is even simpler than the AER's current approach.

Moreover, any ranking according to the 'simplicity' criterion should also take into account feasible steps able to be taken by the AER to assist stakeholders. For example, it would be a simple task for the AER to periodically publish market estimates of expected inflation for the use of stakeholders.

Problem 10: Excludes relevant evidence

The DAE report recommends that the AER should set regulatory inflation on the base of a small subset of the available evidence, being:

- RBA forecasts for Years 1 and 2; and
- The AER's own assumption about inflation expectations moving immediately to 2.5% in Year 3 and every year thereafter.

This approach gives zero weight to all other evidence, including market evidence and surveys. DAE does not explain why it considers that giving any consideration to any of that other evidence would lead to an estimate of expected inflation that is inferior to the AER's current estimate.

7.4 Questions to be addressed by DAE

ENA submits that it would be useful for all stakeholders, and especially for the AER, if DAE was to respond to the following questions:

1. What does DAE consider to be the best estimate of expected inflation for each of the next ten years, for example, as published in its recent *Business Outlook*? How do these estimates compare with the AER's estimates?
2. Does DAE consider that the best estimate of expected inflation is obtained by having no regard to any market data? That is, does DAE consider that an estimate that applies any weight to any evidence from financial market prices would be inferior to the AER estimate?
3. Was DAE instructed as to the criteria to use in its analysis? If so, why is that instruction not included in the Terms of Reference? If not, why has DAE not explained whether, and if so why, it considers those criteria to be appropriate?
4. Can DAE provide a more precise definition of what it considers 'de-anchoring' to mean? By how much and for how long would an estimate have to be below the target rate or target band to be considered to have de-anchored?
5. Does DAE agree with the characterisation in this submission of the role that the inflation parameter plays in the AER's models (in relation to the return on equity) – of converting a nominal return into a real return?
6. In preparing its report, did DAE consider the role that the inflation parameter plays within the AER's regulatory framework and models? If not, what is the basis for DAE's advice about "which method the AER should use to estimate expected inflation over a 10-year horizon"?

8 The Lally report

ENA's responses to the key conclusions of the Lally report are:

- Dr Lally recommends that, rather than compute an average expected inflation figure, the AER should use a separate estimate for each year of the 5-year regulatory period. ENA considers that this is appropriate for the return on debt (where the benchmark efficient cost is nominal), but not for the return on equity (where the AER has adopted a benchmark efficient real cost).
- ENA disagrees with the conclusion that market estimates are biased by the inclusion of an inflation risk premium. In the AER's regulatory framework, the role of the inflation parameter is to convert a fixed nominal return into a fixed real return. The market data is a direct estimate of the cost of converting nominal to real, so it is perfectly consistent with the role that the inflation parameter plays in the AER's framework. An actuarial estimate of expected inflation is not.
- ENA agrees with Dr Lally's assessment that his root mean squared error calculations "would not be useful" if the prevailing market conditions differed from the conditions over the historical period from 1993. Because the prevailing conditions clearly are different, the historical tests are not useful.

8.1 A separate estimate of expected inflation for each regulatory year over the 5-year period

Debt requires a nominal return allowance

One of the key recommendations of the Lally report is that the AER should adopt a separate estimate of expected inflation for each regulatory year of a 5-year regulatory period, rather than computing an average over 10 years.

The primary rationale for this conclusion is that the AER should be making a deduction for inflation in the PTRM so as to match the expected benefit of RAB indexation in the RFM. Thus, on average, the benefits of RAB indexation will offset the deductions to allowed revenues:

> *This reveals that values for $E(i_1)...E(i_5)$ are each required rather than an estimate of expected inflation over the next ten years or even the next five years.*
>
> *The AER (2020, pp. 10-12) offers contradictory rationales for the inflation deduction in the revenue equations. Initially, it argues that the deduction in (say) equation (2) is to offset (on average) the inflating of the RAB in equation (1). It then asserts that the deduction is to convert the nominal WACC in these revenue equations to a real WACC and, given its use of the ten-year WACC, it therefore estimates the expected inflation rate over ten years so that the terms match. The claim concerning conversion from nominal to real is not correct; conversion would require division in*

accordance with the expectation version of the Fisher formula rather than subtraction. The correct rationale is that noted first by the AER. [71]

ENA agrees with this rationale in relation to the return on debt. As set out in Section 4 above, it is entirely appropriate that the deduction for inflation in the PTRM should equal the benefit of RAB indexation in the RFM. This is because the AER begins with an estimate of the benchmark efficient nominal cost of debt. Thus, the deduction and benefit must exactly offset to ensure that the allowance for the efficient cost of debt is preserved. Otherwise consumers will end up paying either more or less than the efficient cost.

An expected inflation estimate for each year for the return on debt

The Lally report demonstrates that, in the case of a nominal discount rate, the AER's regulatory framework requires a separate estimate of expected inflation for each year of the regulatory period. This is established in Equations (1) to (3) of the Lally report, wherein Dr Lally concludes that:

> *This reveals that values for $E(i_1)...E(i_5)$ are each required rather than an estimate of expected inflation over the next ten years or even the next five years.* [72]

The CEG report attached to this submission shows that this conclusion is supported in relation to the return on debt (for which the benchmark efficient cost is nominal) but not for the return on equity (which is designed to be a real allowance).

Equity requires a real return allowance

In relation to the return on equity, ENA takes a different view to Dr Lally. As set out in Section 5 of this report, ENA accepts that the AER is seeking to deliver a real return. That is, for the return on equity, the role of the inflation parameter is to convert a fixed nominal return into a fixed real return. Given that the required nominal return is estimated for a 10-year horizon, it will reflect 10-year inflation expectations, which will be removed from allowed revenues in the PTRM. The CEG report provides further detail in relation to this conclusion.

ENA notes that Equations (1) to (30 in the Lally report apply to the case of nominal discount rates. Those equations do not apply to the case where the AER has a target 10-year real return. Consequently, the conclusion that a separate estimate of expected inflation is required for each year does not apply to the allowance for the return on equity.

Different approaches are required for debt and equity

Remarkably, the Lally report does not separately consider the nature of the return on debt (benchmark nominal) and the return on equity (benchmark real). Indeed, it is not clear that the AER has properly considered this difference either. The two

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[71] Lally report, p. 5.
[72] Lally report, p. 5.

contradictory rationales presented in the AER's discussion paper can be reconciled by noting that one is appropriate for debt and the other is appropriate for equity, having regard to the very different nature of those two sources of finance.

In summary:

- For the return on debt, the objective is to ensure that the deduction for inflation in the PTRM equals the benefit of RAB indexation in the RFM. This ensures that the regulatory allowance matches the efficient nominal cost of debt. This is achieved by estimating expected inflation for each regulatory year and by using that same figure in both steps of the AER's process.
- For the return on equity, the objective is to convert a fixed nominal return into a fixed real return. This requires an estimate of the cost of converting a 10-year nominal return into a 10-year fixed return. The cost of converting nominal to real returns is a single figure that can be observed via the inflation swap and break-even methods.

8.2 Bias in market estimates

The Lally report notes that the market approaches produce a biased estimate of expected inflation. However, Section 5 demonstrates that the market approaches produce an estimate that is entirely appropriate.

As with every parameter, the "best estimate of expected inflation" is one that is consistent with its role in the regulatory framework. Consequently, one needs to consider how the parameter is used in the regulatory framework and then adopt an estimate that is consistent with that role.

In the AER's regulatory framework, the role of the inflation parameter is to convert a fixed nominal return into a fixed real return. The market data is a direct estimate of the cost of converting nominal to real, so it is perfectly consistent with the role that the inflation parameter plays in the AER's framework. An actuarial estimate of expected inflation is not.

8.3 Root mean squared error (RMSE) results

The Lally report presents RMSE results for a number of forecasting methods, relative to actual inflation outcomes. However, there are a number of issues that arise when interpreting these results:

- As noted above, what is required is an estimate of the cost of converting a fixed nominal return into a fixed real return, so it is not clear what is learned from RMSE computed relative to outturn inflation.
- The Lally report considers a long historical period since the AER began inflation targeting in 1993. Thus, the RMSE figures provide no insights as to whether outturn inflation has been more in line with implied inflation from market measures than the 2.5% midpoint during recent years. For example, the most recent forecast of 10-year inflation considered in the Lally report was made in

December 2009, as a subsequent 10-year period is required to observe outturn inflation.

- The Lally report does not consider the market estimates proposed in this submission. In particular, Dr Lally does not consider:
  - Market estimates computed over a 40-day averaging period, consistent with the way the AER uses market data for other parameters; or
  - The QTC adjusted break-even inflation estimate;[73] or
  - Any combination of market and/or other estimates.

ENA submits that the tests performed in the Lally report would only be informative in the following circumstances (and subject to the above point about the role of the inflation parameter in the AER's process):

- The AER is required to pick one, and only one, of the methods considered by Dr Lally; and
- The prevailing market conditions are not unusual relative to the past period from 1993.

8.4 The prevailing market conditions

The Lally report notes that the prevailing market conditions are materially different from the historical market conditions that form the basis of his RMSE calculations:

> *…this RMSE analysis uses a long time series of data, and therefore assumes stability in the underlying process (which involves mean reversion to or close to the RBA's Target of 2.5%).* ***If the underlying situation has changed, these tests would not be useful****. Thus, it is necessary to assess whether the underlying situation has changed, especially since inflation has fallen below the Target for the past several years. The best information on this question comes from Consensus Economics, who (as of April 2020) forecast reversion to that Target over the next few years. Lastly, and because* ***reversion back to the RBA's Target is currently expected to be unusually slow****, there is a case for the AER adopting a slow glide path from the RBA's forecasts to the Target providing that scenarios in which reversion back from a low figure is unusually slow (to the disadvantage of the businesses) are not likely to*

[73] Dr Lally raises the issue of a liquidity premium as a disadvantage of the break-even estimate. However, the QTC approach provides a conservative adjustment using an upper bound for any such liquidity premium. Dr Lally also questions the liquidity of the inflation swaps market in the circumstance where one counterparty is required to pay a premium to the other to be released from the contract. To the extent that this is an issue, it would be reflected in the bid and offer rates, but is unlikely to affect the closing mid-rates, which is what is recorded in data services such as Bloomberg. Moreover, the use of a 40-day averaging period would further ameliorate any such effect. Moore (2016, https://www.rba.gov.au/publications/bulletin/2016/dec/pdf/rba-bulletin-2016-12-measures-of-inflation-expectations-in-australia.pdf, p. 29) concludes that "longer term averages (such as monthly averages, which the RBA typically uses for inflation swaps) are likely to mitigate these factors."

be matched by scenarios in which reversion back from a high figure is unusually slow (to the advantage of the businesses). [74]

ENA agrees that reversion back to the RBA's target is likely to be unusually slow in the prevailing market conditions. Indeed, this highlights one of the key problems with the AER's current approach – it assumes that inflation has fully reverted back to 2.5% by Year 3 irrespective of whether the starting point is 2.4% or 0.24%.

ENA does not agree that "a slow glidepath" is the most appropriate way of obtaining an estimate in the prevailing market conditions. For the reasons explained in Section 5.12, ENA considers that the glidepath approach is not an estimation method, but rather a means of constraining (in a formulaic way) the process by which the relevant evidence is converted into annual inflation figures.

The last sentence of the above passage from the Lally report implies that the AER could maintain its current approach if there was likely to be a symmetry of errors. Such symmetry would occur if the AER's over-estimate of expected inflation in the current market conditions was likely to be matched by a similar under-estimate of expected inflation in other (high-inflation) market conditions.

ENA strongly disagrees with that view. ENA considers that it is inappropriate (and inconsistent with the NEO, NGO, RPP and Rules) for the AER to set a regulatory allowance that does not reflect the efficient financing costs of the benchmark efficient entity – on the basis that an offsetting error may arise at some time in the future.

A much better approach is to set the correct regulatory allowance in every regulatory period. Setting the correct allowance in every period ensures that every generation of consumers pays only the efficient cost – rather than some generations under-paying at the expense of other generations.

[74] Lally report, p. 3.

9 Implications for networks and consumers

- This section demonstrates that:
  - Under the current arrangements, an investor who expects inflation to be in line with the estimates from market data would expect to receive a total nominal return on equity of 2.06% p.a.
  - Under the current arrangements, current consumers contribute -1.19% to the allowed return on equity, with the balance to be paid by future consumers.
  - The cost of servicing debt during this regulatory period is partly paid by current consumers and partly paid by future consumers, who will pay higher prices due to the inflated RAB.
  - The AER's recent decisions place networks in a loss-making position that is unsustainable. Sapere and Lally have also alerted the AER to this issue.

9.1 Calculation of the expected return on equity

The key features of the AER's approach to inflation, as set out in Section 3 above, are as follows:

- The AER begins by estimating the nominal return that investors require (nominal WACC);
- The AER then deducts its estimate of expected inflation and provides the remainder (a real return) in the form of revenues via the PTRM;
- The AER then adds back actual inflation in the form of RAB indexation in the RFM.

Thus, the return that an equity holder expects to receive can be computed as:

- The cash allowance for the return on equity in the PTRM, being the AER's allowed nominal return minus the AER's estimate of expected inflation; plus
- The benefit that the equity holder expects to receive from RAB indexation under the RFM; plus
- Any payment made or received arising from the AER's regulatory allowance in relation to the return on debt differing from the efficient cost of debt. This last component arises due to the debt allowance problem discussed in Section 4 above. It recognises that the AER's current approach results in over-compensation in some periods and under-compensation in other periods in relation to the return on debt. Any excess or deficit must be absorbed by the equity holders because the firm has a contractual obligation to make the prescribed debt service payments.

Consider, for example, the case where:

- The AER sets the allowed nominal return on equity to 4.56%;
- The AER adopts an inflation expectation of 2.3%; and
- The equity investor expects inflation of 1.3% in line with the market data from inflation swaps. That is, the equity investor holds the same expectations about future inflation as do other financial market investors.

In this case, the return that this equity investor would expect to receive can be computed as:

- A cash allowance for the return on equity in the PTRM of 2.26%, being the AER's allowed nominal return (4.56%) minus the AER's estimate of expected inflation (2.3%); plus
- The benefit that the equity holder expects to receive from RAB indexation under the RFM of 1.3%; plus
- A deficit of 1.5% in relation to the return on debt allowance. This deficit arises because the AER deducts 2.3% and the investor expects the benefit of RAB indexation to be only 1.3%. Thus, the investor expects a deficit of 1% in relation to the allowed return on debt. But because debtholders have a contractual entitlement to be paid in full, that deficit of 1% must be borne by the equity holders. Because the ratio of debt holders to equity holders is 60/40, each equity holder will be required to make a cross subsidy payment of 1.5%.

Thus, the total expected return on equity for an investor who forms inflation expectations in the same way as other financial market investors is 2.06% (2.26 + 1.3 – 1.5), as illustrated in Table 2 below.

Table 2: Calculation of expected return on equity

Item	Amount	Comments
Real return on equity provided by the PTRM	2.26%	Allowed nominal return (4.56%) minus AER expected inflation (2.3%).
Expected RAB indexation	1.30%	Market expectation of inflation, 1.0% below AER forecast of 2.3%.
Subsidy to debt holders	-1.50%	Shortfall of 1.0% scaled by 60/40 debt/equity ratio.
Total nominal expected return on equity	2.06%	Less than AER estimate of current return on debt for BEE (3.4%).

Source: ENA calculations based on AER allowances.

9.2 Return on equity from current and future consumers

The above example can be extended to determine the relative contributions that current and future consumers make towards the allowed return on equity.

As above, we consider the case where:

- The AER sets the allowed nominal return on equity to 4.56%; and
- The AER adopts an inflation expectation of 2.3%.

In that case, equity holders will be provided with a (cash) real return of 2.26% via the PTRM.

The AER will then estimate the benchmark efficient required nominal return on debt and deduct 2.3% from that figure, providing a cash allowance for the remainder. This leaves the firm 2.3% short – because there is a contractual requirement to pay the full nominal return on debt. Equity holders will be required to cover that shortfall. But because the ratio of debt to equity is 60/40, the cost to equity holders of covering that shortfall is 3.45% (2.3% × 60/40).

This leaves a cash return to equity of -1.19% (2.26% - 3.45%). This negative cash return manifests as negative NPAT – the firm is placed into a loss-making position. This is the "underlying inconsistency" that Sapere have identified.

The equity holders then benefit from RAB indexation at the end of the regulatory period. If investors are expecting RAB indexation to be 1.3% (as in the above example), the benefit to equity will be 3.25%, reflecting the fact that equity holders receive the entire benefit of RAB indexation (1.3% × 100/40). This benefit consists of:

- The assumption that additional debt can be raised against the assumed increase in the RAB. This additional debt is assumed to be available to the equity holders as it is raised against the assumed increase in the RAB and is not required for capex. This additional debt will, of course, be serviced and paid back by future consumers; and
- The remaining increase in the RAB, which also results in future consumers paying higher prices.

These calculations are summarised in Table 3 below.

Table 3: Contribution of current and future consumers

Item	Amount	Comments
Real return on equity provided by the PTRM	2.26%	Allowed nominal return (4.56%) minus AER expected inflation (2.3%).
Cash transfer to debt holders	-3.45%	AER deducts 2.3% from allowed return on debt in PTRM. Equity holders must cover the shortfall. Scale by 60/40 debt/equity ratio.
Cash return to equity = Payment by current consumers	-1.19%	2.26% - 3.45%.
Expected benefit of RAB indexation = Payment by future consumers	3.25%	Expected RAB indexation of 1.3% scaled up by 100/40 as equity holders receive full benefit of indexation.

Total nominal expected return on equity	2.06%	-1.19% + 3.25%.

Source: ENA calculations based on AER allowances.

9.3 The return on debt and current vs. future consumers

For each regulatory period, the AER computes the benchmark efficient nominal cost of debt. As noted throughout this submission, networks are contractually obliged to pay those nominal debt charges during the regulatory period. However, the AER provides a cash allowance for only part of the efficient cost of debt (i.e., the AER subtracts its estimate of expected inflation). The remainder of the compensation comes from the assumed growth from indexation of the RAB.

That is, the cost of servicing debt during this regulatory period is partly paid by current consumers and partly paid by future consumers, who will pay higher prices due to the inflated RAB.

ENA's proposed amendment does not change this approach, as ENA simply submits that the same figure should be used when deducting inflation in the PTRM and when adding it back in the RFM.

9.4 Recent regulatory allowances place networks in a loss-making position

Recent decisions from the AER place networks in a loss-making position. The combination of the AER's current allowed return on equity and its estimate of expected inflation are such that:

- SAPN is scheduled to incur losses in every year of its current regulatory period, amounting to $135 million in total;
- Energy Queensland is scheduled to incur losses in every year of its current regulatory period, amounting to $510 million in total; and
- The NSW distribution business have also been placed into loss-making positions in their most recent determinations.

The AER considered this as part of its "cash flow analysis" in its decisions for SAPN, Energex and Ergon Energy, concluding that these outcomes are not a source of concern.[75] In particular, the AER's focus has been on whether there might be sufficient cash from other sources to 'plug the gap' that arises from a negative allowed cash return to equity over the 5-year regulatory period.

ENA notes that these effects have arisen in the AER's recent determinations. The negative profit allowances arise under the PTRM for new regulatory periods under the 2018 Instrument.

[75] See for example, the Energex Final Decision, Attachment 3, pp. 3-24 to 3-25.

The potential sources of cash, and their role in offsetting the losses that are embedded into the benchmark regulatory allowance, are as follows:

- **Depreciation allowances**

  It is not sustainable for a network to be diverting its depreciation allowance to offset a negative allowed cash return to equity. If maintained, that approach would inevitably result in a network that deteriorated over time as funds that would otherwise be used to maintain the quality of the network are diverted to offset the losses that result from the regulatory allowance.

- **Borrowing against an assumed increase in the value of the RAB**

  The AER's models assume that the RAB will increase in line with the AER's estimate of expected inflation and that the network will be able to borrow 60% of that assumed increase. However, there are three problems with this solution:

  - The assumed growth in the RAB is materially overstated. For example, in its most recent decisions, the AER assumes RAB growth of 2.3% in each of the next three years. By contrast, DAE are currently forecasting 0.18%, 1.18%, and 1.59%, respectively and the RBA is forecasting 1.25% for each of the next two years. So there is no realistic expectation that the assumed growth in the RAB will ever occur.
  - In any event, borrowing against the assumed increase in the RAB has no effect on net profit. That additional borrowing is not revenue – it is a liability that must be repaid (with interest) by future consumers. That is, it is simply a transfer of cash from future consumers to current consumers. It is not a source of revenue that helps to offset a negative profit allowance.
  - Companies are only able to pay distributions out of retained profits. It is not sustainable to continue to allow negative profits and to seek to use cash raised by borrowing against an assumed increase in asset values to pay distributions.

- **Incentive payments**

  The allowed return should not be set below the efficient financing costs, such that incentive payments might make up the difference. Rather the allowed return should be commensurate with the efficient financing costs of a benchmark efficient entity. The AER has indicated that its 2018 Instrument is consistent with that objective,[76] in which case there should be no shortfall that might be made up via incentive payments.

  Moreover, it is not sustainable for networks to have to rely on outperforming efficient benchmarks to offset negative profit allowances. When networks outperform a benchmark, that benchmark is revised in accordance with incentive-based regulation. With each iteration it becomes more difficult to outperform the benchmark.

- **Income from unregulated assets**

[76] AER, December 2018, Final Rate of Return Instrument: Explanatory Statement, p. 29.

In line with the analysis of incentive payments above and the benchmark firm framework, allowed returns should not be set below the efficient financing costs, such that income from unregulated assets might make up the difference.

On the issue of regulatory allowances being set such that networks incur a loss in each regulatory year, Sapere have advised the AER that:

> *…we note that the **sustained fall in inflation expectations** mean that the parameter estimates determined recently by the AER imply a negative cashflow return on equity for a benchmark efficient entity. An assumption that the benchmark efficient entity would fund dividends (and growth) from depreciation cashflows—that is, spending less on replacement of real capital—**would not be consistent with the efficient investment and efficient operation of an NSP**, at least beyond the short-term. Borrowing to pay dividends may be justified by the higher increase in the RAB (than would be expected with a positive cash rate of return on equity) and consequential increase in revenue, though may alter the cash payment profile for consumers.*
>
> *We suggest that the AER consider, during its 2020 Inflation Review, whether a projected negative cash return on equity might indicate **an underlying inconsistency** in one or more inputs into its estimate of WACC and expected inflation.*[77]

Similarly, Lally has advised the AER that the cause of the negative profit allowance is the AER's adoption of an expected inflation figure that is "too high":

> *QTC (2019) goes on to present estimates of **NPAT for Ergon Energy and Energex over the 2021-2025 period, which are negative for both firms** for all years. These estimates are all based on the AER's estimate for expected inflation over the next ten years of 2.45%. As argued in section 2 above, the appropriate estimates for expected inflation should be specific to each year and, in the presence of RBA forecasts over the next two years that are significantly below the Target, **the AER's estimate is too high for each of these years** examined by the QTC.*[78]

ENA submits that there is a real issue here that requires careful consideration by the AER. The setting of regulatory allowances that put networks into a loss-making position is a new development with important consequences for networks and future consumers. It is clearly not consistent with one of the key objectives of the regulatory regime that NSPs be given a reasonable opportunity to recover their efficient costs, nor is putting networks in such a position in the long-term interests of consumers. This issue has been raised by networks and the AER's own consultants. It should not be taken lightly.

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[77] Sapere report, paragraphs 10-11, emphasis added.
[78] Lally report, p. 31, emphasis added.

9.5 Modelling of ENA's proposed changes

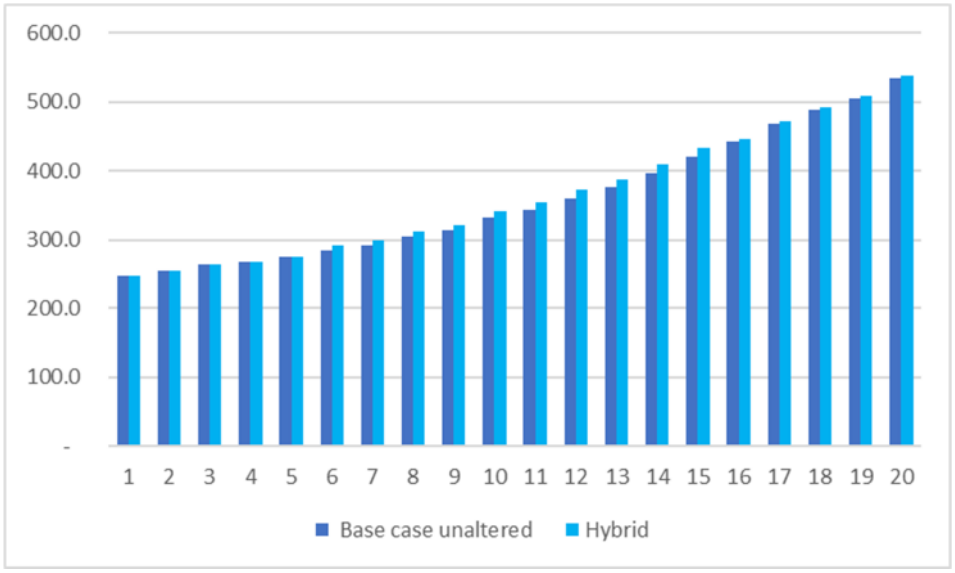
The AER's default model inputs

The AER's inflation simulator model can be used to generate revenue outcomes under the 'hybrid' model proposed in this submission and under the AER's current 'base case' model. The ENA has implemented the proposed hybrid model within the AER inflation simulator by amending the operation of the RFM to separately index the debt and equity portions of the RAB as follows:

- Debt is indexed in the RFM using the same inflation assumptions used in the PTRM; and
- Equity is indexed in the RFM using actual outturn inflation (i.e., no change from the AER's base case model).

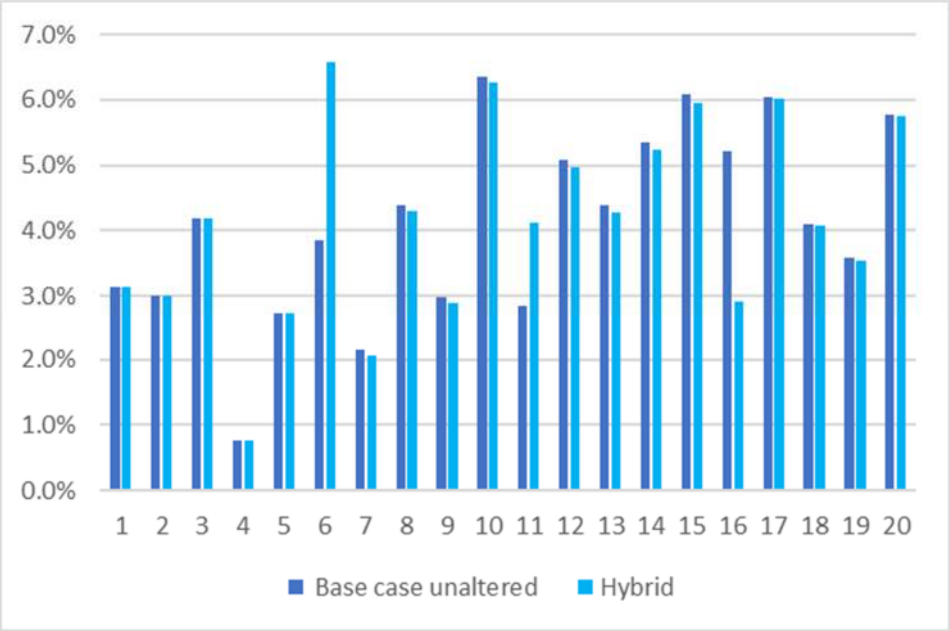
The AER's simulator covers 4 regulatory periods (20 years). The AER model also has a default set of randomly generated actual inflation outcomes populating row 26 of the Inputs sheet and an assumption of a constant 2.5% expected inflation in the base case (row 3 of the Inputs sheet). If we retain these, and all other AER inputs, we can generate revenues for 20 years for both the AER base case and the proposed hybrid. These are illustrated below in both absolute levels and annual percentage change in prices.

Figure 8: Hybrid vs. base case revenues



Source: AER simulator model using default inputs.

Figure 9: Hybrid vs base case percentage change in revenues



Source: AER simulator model using default inputs.

Figure 8 and Figure 9 show that revenues, and revenue percentage changes, are very similar in most years. The only years in which there are materially different revenue percentage changes are year 6, year 16 and, to a lesser degree, year 11. These are the first years of the second, fourth and third regulatory periods respectively.

In year 6 the hybrid delivers a higher revenue increase which reflects the fact that modelled actual inflation averaged over the first regulatory period (1.50%) was lower than modelled expected inflation (2.50%). By contrast, in year 16 the base case delivers a higher revenue increase than the hybrid which reflects the opposite outcome over the third regulatory period (modelled actual inflation averaged 3.31% compared to modelled expected inflation of 2.50%).

This illustrates a general mathematical property of the models that, so long as AER expected inflation is an unbiased estimate of actual inflation, the hybrid and the base case will deliver the same revenues on average. That is, so long as under and over-forecasting of actual inflation have the same probability and magnitudes then there is no difference in expected revenues under the two regimes.

Expanded simulation analysis

To illustrate the general effect of the proposed hybrid model, the ENA has run the AER inflation simulator 100 times and collected the hybrid and base case revenues for each 20-year simulation. This gives 2,000 years in total for comparison.

The ENA has made one further change to the inflation simulator for this purpose. The simulator, as published by the AER, draws a random inflation value for each year from a normal distribution that has a mean of 2.42% (and a standard deviation of 1.22%). This 2.42% estimate is based on the mean of all inflation outcomes since 1996 (the beginning of inflation targeting by the RBA).

However, the AER base case assumes a constant 2.50% expected inflation – consistent with AER's actual regulatory practice to assume that, absent an RBA forecast to the contrary, expected inflation is always 2.50% (i.e., 8bppa higher than the historical average since 1996). This means that 2.50% is, in fact, an upwardly biased estimate of true model expected inflation (2.42%).

If this is not corrected then the hybrid will, on average, deliver higher revenues than the base case. However, this would be purely due to an upward bias in the AER's expected inflation estimate being embedded into the calculations. To remove this bias from the model inputs, the ENA has altered the VBA code so that the mean of the distribution from which actual inflation is drawn is 2.50%.

The hybrid and the base case deliver essentially the same average revenue and the same variance in revenues. Across the 2,000 modelled years, the average revenues for the base case was $374.9m while the average revenue for the hybrid was $374.2m (i.e., the hybrid revenues were 0.002% lower on average). The hybrid had slightly lower variance than the base case (2.6% lower). Key statistics are summarised in Table 4 below.

Table 4: Comparison of revenue levels and volatility

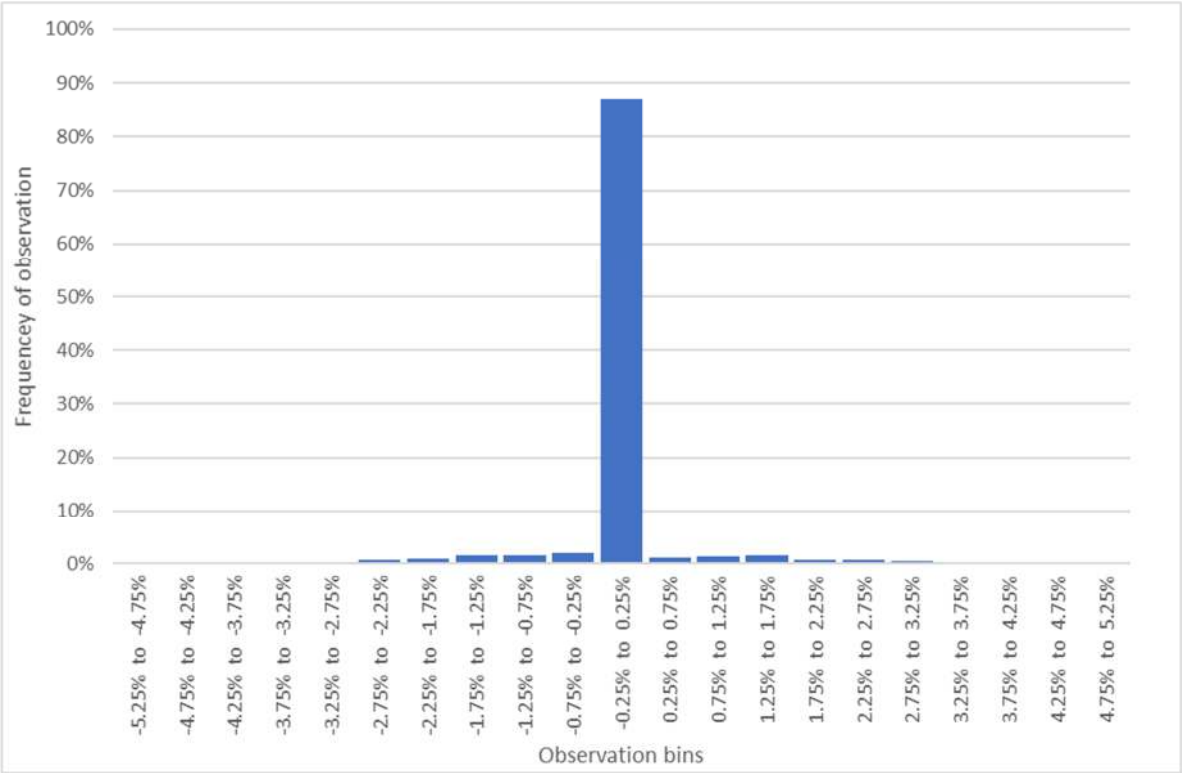
Metric	Hybrid	Current	Difference as a %
Average revenue	374	375	-0.2%
Variance	8,243	8,465	-2.6%
Standard Deviation	91	92	-1.3%

We have also compared the percentage change in revenues each year for the hybrid and the base case in each of the 2,000 years modelled. The average difference for our simulation is -0.008%. That is, under the hybrid, the percentage increase in revenues in each year was less than the percentage change in revenues for the current regime by 0.008%.

These results are consistent with the mathematical property that the expected difference is zero (i.e., the observed difference is due to noise from the random inflation simulation).

Moreover, 55% of the years had revenue percentage increases that lay between 0.05% of each other. 85% of years lay between 0.15% of each other. These results are graphed in the below histogram. The horizontal axis describes the magnitude of the difference in revenue changes under the model. The vertical axis describes the frequency with which any given magnitude of difference in observed. The tallest bar shows that 55% of the modelled years had revenue changes for the models that were within 0.05% of each other.

Figure 10: Histogram of the difference in percentage revenue increases (hybrid less base case)



Source: AER simulator model; 100 simulations.

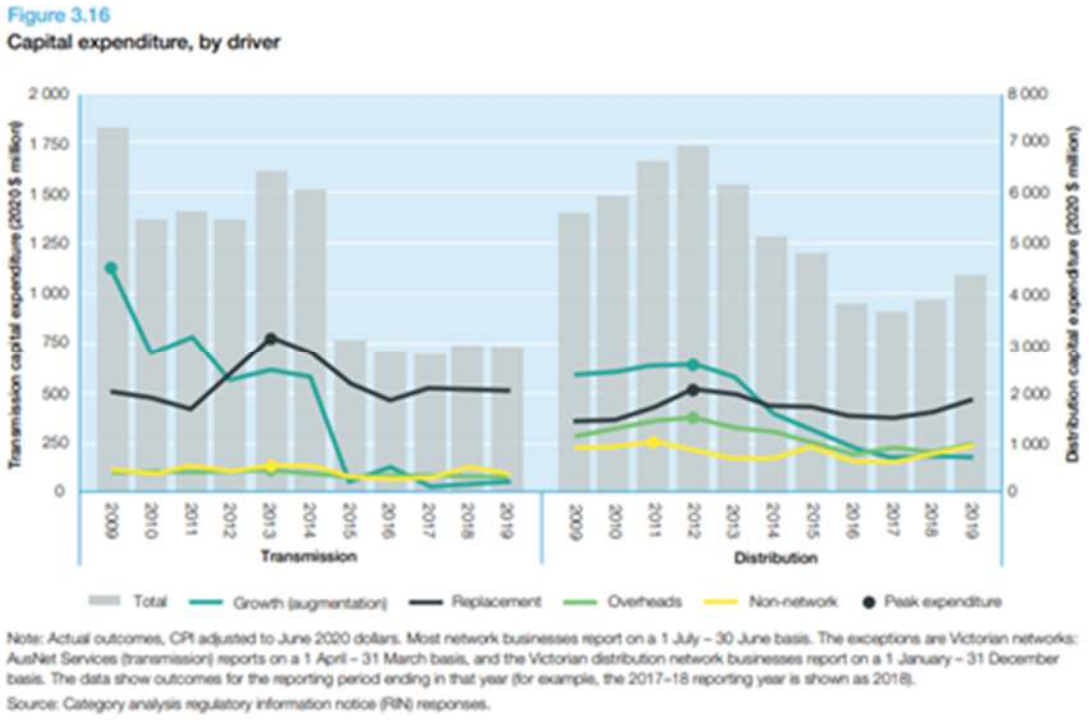
Finally, ENA notes that the above analysis relates to network revenues, which are only one (reducing) component of customer bills. It also assumes that all other regulatory parameters remain at the default levels embedded in the AER's simulator model. Thus, a change to the proposed hybrid approach is likely to have an imperceptible effect on customer bills compared to other sources of variation such as changes in wholesale energy costs.

9.6 Current impact on investment

The AER's allowed return on equity is currently at a record low level of 4.56% per annum. Section 10.1 above shows that investors who expect inflation to be lower than the AER's estimate of 2.3% per annum will expect to receive even less than this. Indeed, an investor who expects inflation to be in line with market estimates (rather than the AER's estimate) will expect a return on equity of approximately 2.0% per annum.

This is already having tangible effects. For example, the AER's most recent State of the Energy Market report shows that transmission growth capex has reduced to around $50m over the last several years, as shown in Figure 11 below.

Figure 11: Network capital expenditure



Source: AER 2020 State of the Energy Market report, Figure 3.16, p. 142.

The above figure and other AER published data in the *State of the Energy Market* shows that, for distribution networks, capital expenditure over the last several years has been at or close to decade lows, with some categories reduced by approximately two thirds since the AER's 2013 Guideline and that transmission growth capex has reduced to around $50 million.

It is important to note that this dramatic decline in investment has occurred prior to the further material reductions in allowed returns that will flow from the AER's decisions under the 2018 Rate of Return Instrument.

Implementing a reasonable approach to regulatory inflation is a key step in repairing the regulatory framework and restoring confidence in it. It would be a step towards recreating a regulatory regime that delivers the reasonable regulatory allowances that are required to support the major investment that is required for the transformation of Australia's energy system.

10 Miscellaneous issues

» ENA submits that there is no reasonable basis for concluding that the AER's regression-based equity beta estimates would have been any different if the AER had been using a different approach to estimate expected inflation. Any such assumption would be speculative and arbitrary.

10.1 Do current equity beta estimates reflect the risk of a bad inflation forecast?

The AER's Discussion Paper speculates that "inflation-related risks" may be reflected in the AER's equity beta estimates:

> *NSPs expect to receive a set real rate of return on the overall RAB, but inflation-related risks may still be present. This may present inflation risk to the NSPs. However, NSPs are likely to be compensated for these risks through our current approach to setting the rate of return.*
>
> *This is because the equity beta, which is part of the return on equity, should reflect the systemic risk incurred by equity investors in Australian regulated energy utility firms. We estimate the beta using market data on the variability of returns for listed regulated energy networks in Australia.*
>
> *If inflation risks due to regulation meant that the NSPs faced higher systemic risks, then the calculated equity betas in the Capital Asset Pricing Model (CAPM), would likely reflect this. Given that our current approach to estimating expected inflation has been applied consistently for a number of years, the NSPs would therefore be compensated for their current levels of inflation risks through the beta and the allowed rate of return.*[79]

However, the key risk here is that the AER adopts an unreasonable estimate of expected inflation. It is not clear that regulatory mis-estimation is a systematic risk and therefore related to beta. That is, it is not clear that the risk of regulatory estimation error is related, in a structural way, to conditions in the broader market for securities, which informs the AER's beta estimate.

In any event, that risk has been low until recent years. For most of the data period that the AER uses to estimate beta, the AER approach to forecasting inflation was broadly reflective of market data. However, in the last round of resets there is an extremely high degree of divergence between the AER's forecast of inflation and market expectations. This is a new risk that has emerged in the current (extraordinary and unprecedented) market conditions and which is not reflected in the AER's 2017 beta estimates.

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[79] AER, May 2020, Discussion Paper: Regulatory treatment of inflation, p. 29.

In order for the risk of regulatory mis-estimation of expected inflation to be reflected in the AER's beta estimates it would have to be the case that:

- Even though the AER has never before set regulatory allowances that lock in negative profits, or adopted an inflation forecast more than 1% above the figure from market data, equity investors should have known that such an outcome was possible; and
- This realisation has affected monthly stock returns (i.e., monthly stock returns are different than they would have been had investors not anticipated that the AER might deliver such outcomes); and
- The impact on monthly stock returns is so material that it has an identifiable effect on the equity beta estimates that the AER compiled in 2017.

ENA submits that there is no reasonable basis for concluding that the AER's regression-based equity beta estimates would have been any different if the AER had been using a different approach to estimate expected inflation. Any such assumption would be speculative and arbitrary.

Rather than speculating about what beta estimates might or might not have been in unobservable counterfactual scenarios, a better approach would be to estimate equity beta in the standard manner based on observed stock returns. If a change in regulatory approach does affect the true systematic risk of the firm, that change will be observable in the statistical beta estimates.

11 Response to AER questions

This section sets out brief responses to the questions posed in the AER's Discussion Paper.

1. *What are the available indicators of expected inflation and what are their strengths and weaknesses?*

   As with every parameter, the 'best estimate of expected inflation' is one that is consistent with its role in the regulatory framework. The role of that parameter in the AER's framework is to turn a fixed nominal return into a fixed real return. This is exactly what the market estimates provide – the current market price of converting nominal into real. The AER has previously rejected the market evidence on the basis that it provides an estimate of the price of converting nominal into real, rather than an actuarial estimate of future inflation. But far from being a disadvantage, the market estimates have the great advantage of being perfectly consistent with the role that the inflation parameter plays in the AER's framework. This point is explained in Section 5 of this submission.

   ENA shares the concerns that have previously been raised in relation to a glidepath approach. The start and end points of any glidepath are inevitably arbitrary and should not be fixed across all market conditions. For example, it would be reasonable to have a much longer glidepath in the current market conditions when inflation is at very low levels than if recent inflation had been, say, 2.3% over the past few years.

   But rather than impose some unnecessarily arbitrary constraints, the better, and simpler, approach would be for the AER to determine an estimate of expected inflation having regard to all of the relevant evidence.

   In particular, there is no need for the AER to select one single method to the exclusion of all other relevant evidence. Regard should be had to all relevant evidence. As explained in Section 5 of this submission, market data provides the most direct estimate of inflation for regulatory purposes:

   - The market approaches provide direct estimates that are commensurate with the role that the inflation parameter plays within the AER's regulatory framework. They indicate the market price of converting fixed nominal returns into fixed real returns, which is precisely the role of the inflation parameter in the AER's framework.
   - Market prices are set by sophisticated market participants in trades where there is real money at stake. This is the basis for the AER's use of market prices to inform other parameters.
   - Any bias is either small (according to the AER's own analysis) or conservative in favour of lower regulatory allowances, or both.

2. *Should we continue to use our current approach to estimating expected inflation?*

   ENA submits that the AER should make two changes to its current approach:

- In relation to the return on debt, the AER should use the same figure when deducting inflation in the PTRM and when indexing the RAB in the RFM. The reasons for this approach are set out in Section 4 of this submission.
- When estimating expected inflation, the AER should have proper regard to all relevant evidence. See response to (1) above.

3. *Are there improvements we could make to our current approach to estimating expected inflation?*

   See response to (2) above.

4. *Should we use an alternative approach to estimating expected inflation? If so, set out the alternative approach and its advantages over our current approach?*

   See response to (2) above.

5. *Does our current approach deliver the target ex-ante expected real rate of return?*

   The current approach delivers the AER's targeted real return. However, this is the wrong target in two respects:

   - The benchmark efficient return on debt is a nominal return, in which case it is wrong to target a real allowance.
   - In relation to the return on equity, the AER's targeted real return is manifestly too low because the AER has deducted an unreasonably high estimate of expected inflation.

6. *Should we switch to a nominal or hybrid approach to setting NSP revenues?*

   A hybrid approach should be used, as described in Section 4, and for the reasons set out in that section. The rationale for that approach is straightforward – the regulatory allowance for the return on debt and the return on equity should each be commensurate with the benchmark efficient costs.

   Neither NSPs nor consumers should be asked to bear the risk that the regulatory allowance will differ randomly from the benchmark efficient cost. This is not in the long-term interests of consumers, nor does it promote efficiency by the NSP. Investors should not be under-compensated relative to the efficient cost and consumers should not overpay relative to the efficient cost.

   Moreover, setting the regulatory allowance to be commensurate with the efficient cost is the approach that will contribute best to the achievement of the NEO, NGO and is consistent with the RPP.

   Implementation is straightforward. When next indexing the RAB, for 60% of that calculation the AER would simply use the same inflation figure that was used in the PTRM.

7. *What is the best approach to incorporate inflation expectations into the trailing average return on debt?*

   The best approach is to not incorporate inflation expectations into the trailing average approach because it is unnecessary and inconsistent with the calculation of a benchmark efficient financing cost.

The benchmark efficient firm issues nominal debt, so should be provided with compensation commensurate with that efficient cost. That is simply achieved by using the same inflation figure in the PTRM and RFM. There is no need for any complicated calculations involving trailing averages of inflation expectations – it is entirely unnecessary.

12 Appendix: Regulatory outcomes if the AER's estimate of inflation expectations differs from true inflation expectations

Under-recovery of the required real rate of return

Paragraph 58 of the Sapere report presents the following equation for the 'net nominal revenue' in year t in regulatory period j delivered by the AER's regulatory framework:

$$NNRT_t^j = \left[\left(A_0^j + RNC_1^j + \cdots + RNC_{t-1}^j\right)(1+e^j)^{t-1}\right]\left(w_t^j - e^j\right) + RD_t^j(1+e^j)^t \quad (1)$$

Sapere argues that Equation (1) shows that in any given year t in regulatory period j, "the NSP achieves the expected real return on its opening asset base (the term in square brackets), plus expected nominal depreciation."[80] It is on the basis of this equation (which is derived in Appendix C of the Sapere report) that Sapere concludes that the "The AER approach delivers the intended real rate of return regardless of whether outturn inflation is above or below the AER forecast of inflation."[81]

Equation (1) does indeed demonstrate that the AER's approach delivers the real rate of return *targeted by the AER*. However, that real rate of return may differ from the real rate of return *targeted by investors*. The real returns targeted by the AER and by investors may differ from one another if the investors have a different expectation of inflation over the regulatory period than the estimate derived by the AER. The AER cannot observe investors' true inflation expectations. Instead the AER seeks to estimate these inflation expectations. The AER's estimate of true inflation expectations may be subject to estimation error. Hence, the AER's estimate of inflation expectations over regulatory period j may be written:

$$e^j = i^j + u^j \quad (2)$$

where i^j is the market (or investors') assessment of inflation over regulatory period j (as defined by Sapere) and u^j is the error with which i^j is estimated by the AER.

Hence, Equation (1) may be rewritten as:

$$NNRT_t^j = \left[\left(A_0^j + RNC_1^j + \cdots + RNC_{t-1}^j\right)(1+i^j+u^j)^{t-1}\right]\left(w_t^j - i^j + u^j\right) + RD_t^j(1+i^j+u^j)^t \quad (3)$$

[80] Sapere report, para. 59.
[81] Sapere report, para. 6.

Given that investors hold inflation expectations of i^j, the net nominal revenue in year t in regulatory period j required by investors (as opposed to delivered by the AER's approach) is:

$$NNRT\_I_t^j = \left[\left(A_0^j + RNC_1^j + \cdots + RNC_{t-1}^j\right)(1+i^j)^{t-1}\right]\left(w_t^j - i^j\right) + RD_t^j(1+i^j)^t \quad (4)$$

The difference between what is required by investors and what is delivered by the AER's approach is given by the difference between Equations (4) and (3):

$$\underbrace{X\left[(1+i^j+u^j)^{t-1}\left(w_t^j - i^j - u^j\right) - (1+i^j)^{t-1}\left(w_t^j - i^j\right)\right]}_{\text{Difference between real return on capital expected by investors and real rate of return delivered by AER approach}} + \underbrace{RD_t^j\left[(1+i^j+u^j)^t - (1+i^j)^t\right]}_{\text{Difference between return of capital expected by investors and return of capital delivered by AER approach}} \quad (5)$$

where $X = A_0^j + RNC_1^j + \cdots + RNC_{t-1}^j$.

Equation (5) may be either positive or negative, depending on the values of the relevant variables. The first term in Equation (5) represents the difference between the real return on capital required by investors and the real return on capital delivered by the AER's approach. The second term in Equation (5) represents the difference between the return of capital expected by investors and the return of capital delivered by the AER's approach.

Suppose that $u^j > 0$ such that the AER overestimates investors' true inflation expectations. The return of capital delivered by the AER's approach will be greater than the return of capital expected by investors (i.e., the second term in Equation (5) will be positive) since the investors will have a lower expectation of nominal depreciation than is estimated by the AER.

However, the real return on capital delivered by the AER's approach will typically be lower than the real return on capital required by investors (i.e., the first term in Equation (5) will typically be negative).[82]

Whether the net difference between these two opposing effects is positive or negative depends on the size of the return of capital relative to the RAB. It can be shown that Equation (5) will be negative when $u^j > 0$ and $RD_t^j < RD^{Crit}$, where RD^{Crit} is defined as:

$$RD^{Crit} = X\left[1 - (1+w_t^j)\frac{(1+i^j+u^j)^{t-1} + (1+i^j)^{t-1}}{(1+i^j+u^j)^t + (1+i^j)^t}\right] \quad (6)$$

[82] Note that the difference may be positive if the growth in the RAB under the AER forecast outweighs the reduction in the rate applied to the RAB. This may occur if t and w are sufficiently large. However, for this to occur in the final year of a five-year regulatory period with $i \geq 0$ the allowed rate of return would need to be at least 25%, which is virtually impossible under the 2018 Rate of Return Instrument.

That is, if RD_t^j is sufficiently small, then if the AER overestimates investors' true inflation expectations, then Equation (5) will be negative and the AER's approach would deliver a lower real return on capital (i.e., a lower real rate of return) than is required by investors.

To put the real return of capital in relative terms, consider the limit of equation (6) as $i^j \to 0$ and $u^j \to 0$. The critical value can be expressed as:

$$RD^{Lim} = X\left[1 - (1+w_t^j)\frac{t-1}{t}\right] \quad (7)$$

In the fifth year, the expression in the square brackets will be less than 20%. If a nominal rate of return of 8% were adopted, RD^{Lim} would be approximately 14% of RAB. This is a very large proportion. In earlier years the threshold would be even higher.

That is, for reasonable ratios of real depreciation to real RAB, Equation (5) will be negative so that the AER's approach will deliver a lower real rate of return than is required by investors, if the AER over-estimates investor's true inflation expectations. When $u^j = 0$ (i.e., when the AER estimates investors' inflation expectations perfectly), then the AER's approach will deliver precisely the real rate of return required by investors.

Under-recovery of the required real rate of return on equity

Paragraph 90 of the Sapere report shows that the real rate of return on equity delivered by the AER's approach is given by Equation (8) below:

$$k^j - \left(e^j - a_t^j L\right)/(1-L) \quad (8)$$

Paragraph 91 of the Sapere report shows that this real rate of return on equity differs from the real rate of return on equity targeted by the AER, $k^j - e^j$, by:

$$L\left(e^j - a_t^j\right)/(1-L) \quad (9)$$

Equation (9) will be positive as long as $a_t^j < e^j$, all else remaining equal. That is, if actual inflation in year t in regulatory period j is lower than the AER's estimate of expected inflation, then the real rate of return delivered by the AER's regulatory approach will be lower than the AER's *estimate* of the real rate of return required by equity investors.

However, the real rate of return on equity actually required by investors (as opposed to the rate targeted by the AER) is $k^j - i^j$. Hence, the difference between the real rate of return required by investors and the real rate of return delivered by the AER's approach is given by:

$$\left[e^j - i^j + L\left(e^j - a_t^j\right)\right]/(1 - L) \quad (10)$$

However, as noted above, the AER's estimate of investors' true inflation expectations may be subject to estimation error. Hence, using Equation (2), Equation (10) may be re-written as:

$$\left[u^j + L\left(e^j - a_t^j\right)\right]/(1 - L) \quad (11)$$

Equation (11) > (9) whenever $u^j > 0$.

Equation (9) derived by Sapere shows that when actual inflation turns out to be lower than the AER's estimate of inflation expectations, then equity investors will receive a lower real rate of return on equity than is targeted by the AER. Equation (11) shows that if the AER overestimates investors' true inflation expectations, then the difference between the real rate of return on equity required by investors and the real rate of return on equity delivered by the AER's approach will be greater than implied by Equation (9).

ceg COMPETITION ECONOMISTS GROUP

Delivering meaningful real returns via the PTRM, RoRI and RFM

July 2020

COMPETITION ECONOMISTS GROUP

Table of Contents

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List of Figures

List of Tables

1 Executive summary

1. The AER methods and models (RoRI, PTRM, revenue and RFM RAB indexation) together target and deliver a real return on capital. Currently, the PTRM deducts an estimate of future inflation to derive a real return on both debt and equity from the nominal values estimated pursuant with the RoRI. Then inflation indexation of debt and equity costs in the RFM and revenues provides compensation for actual inflation.

2. There is a proposal to instead use PTRM inflation to index the debt portion of the RAB in the RFM (the 'hybrid' approach). This proposal is not the subject of my report. Rather, I examine whether the current models and methods fit together to deliver economically meaningful estimates of the real cost of debt and equity?

3. My key conclusion is that debt and equity are estimated differently in the RoRI and have different inflation compensation built into their nominal values. It follows that the PTRM should treat them differently. Specifically, different values for inflation should be used to index the debt and equity portions of the RAB within the PTRM.

    i. Equity is incurred as a real cost and, therefore, the objective should be to remove the inflation compensation that is embedded in the nominal RoE (via the 10-year nominal risk-free rate (estimated pursuant with the RORI)). This means that PTRM inflation applied to the equity portion of the RAB should:

        a. continue to be 10-year estimate (consistent with the risk-free rate tenor); and

        b. seek to capture total inflation compensation embedded in the risk-free rate (i.e., both expected inflation and any inflation risk premium (IRP)). This conclusion is consistent with Sapere's advice to the AER.

    ii. Conclusion i.b., materially affects any assessment of 'bias'. Deloitte's view that market measures are biased because they include an IRP should be reconsidered.

    iii. Debt, by contrast, is incurred as a nominal cost. Consequently, any real cost of debt derived in the PTRM must be expected to deliver, when combined with subsequent inflation indexation, the nominal cost of debt estimated pursuant to the RoRI. This requires that the PTRM index the debt portion of the RAB using a 5-year expected inflation estimate (i.e., the objective of PTRM inflation applied to debt is to remove the inflation compensation that is expected to be provided by subsequent RAB RFM and revenue indexation). This is consistent with the proof of the same proposition provided by Lally (although I show that the Lally's proof applies differently to real equity and nominal debt costs).

4. These reforms should be considered even if the AER continues to target real returns.

2 Summary of the current regime

5. Within the PTRM inflation plays several roles. However, the key role that this report focusses on is to turn nominal returns on equity and debt into real returns. The mechanism by which this is done is via applying negative depreciation to the debt and equity portions of the RAB – effectively deducting PTRM inflation from the cash-returns over the regulatory period.

6. Even if the AER continues to estimate a real return on both debt and equity, its methods and models need to be reconsidered so that they fit together to deliver an economically meaningful real return for both debt or equity.

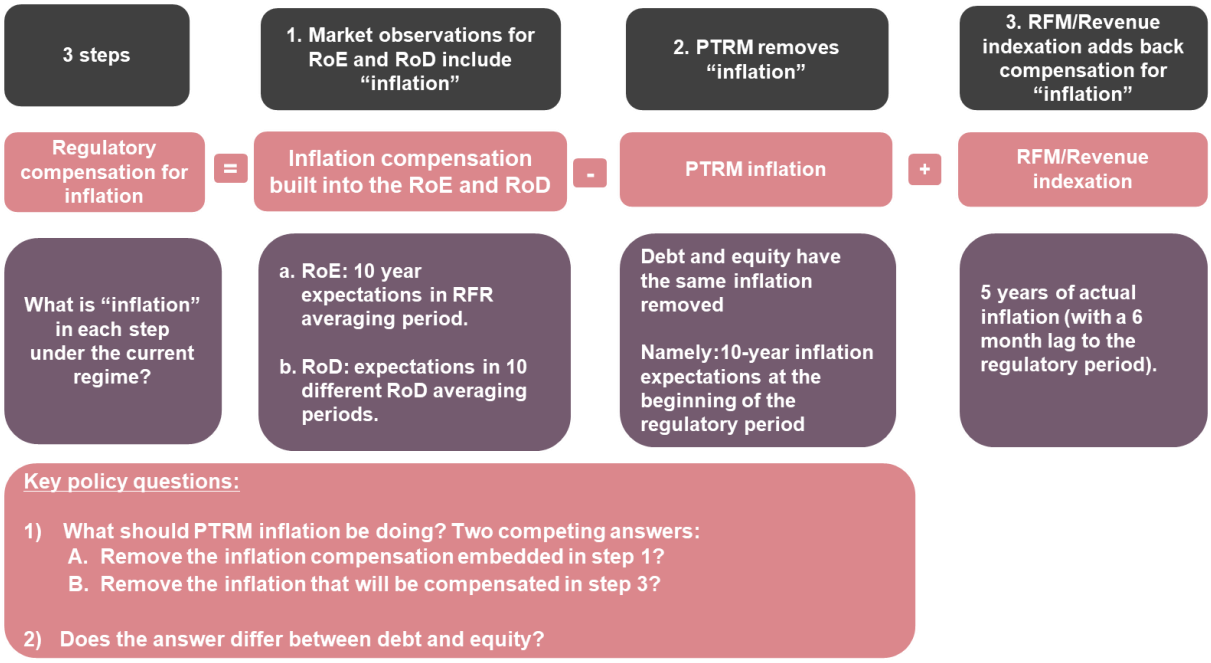
7. The AER's current regime is summarised in the graphic below. Inflation enters (and leaves) the regulated return in three places:

   i. Market rates of inflation compensation are embedded in nominal yields for the risk-free rate and trailing average cost of debt estimated pursuant to the RoRI;

   ii. PTRM derives real returns by removing inflation from debt and equity returns;

   iii. Compensation for actual inflation is added back via indexation of the RAB in the RFM (and, to a lesser extent, via indexation of revenues).

Figure 2-1: Summary of current regime



8. Only with this full structure of the regulatory regime in mind can one ask what the economically logical best estimate of PTRM inflation is. The key questions, as set out at the bottom of the figure, are:

   i. Should the PTRM inflation estimate be seeking to:

      A. Remove the inflation compensation embedded in step 1? Or

      B. Remove the inflation compensation expected in step 3?

   ii. Does the answer differ between debt and equity?

9. In this report I will explain that the answer depends on whether the costs estimated in the RoRI have been incurred in nominal or real terms. I will argue that if the costs are real (equity) then "A" is the correct objective but if the costs are nominal (debt) then "B" is the correct objective.

10. Dr Lally has provided a mathematical proof of the latter finding. Specifically, Lally shows that, if discount rates are nominal, the NPV=0 condition is only met if PTRM inflation is based on expected inflation over the regulatory period. I amend Dr Lally's proof to show that if equity costs are real then the NPV=0 condition is only met if the PTRM attempts to remove the inflation compensation embedded in the nominal risk free rate (which is a 10 year estimate). This analysis can be found in Appendix A.

11. A further key conclusion of this report is that the AER models and methods are currently doing neither A nor B. That is, the inflation being removed in the PTRM neither:

    A. Removes the inflation compensation embedded in the cost of equity or cost of debt estimated pursuant to the RoRI.

    nor

    B. Removes the inflation compensation *expected* to be provided via revenue and RAB indexation in the RFM.

12. This is true for both the cost of equity and the cost of debt (although, because these are estimated differently pursuant with the RoRI they need to be analysed separately). I note that none of my conclusions depend on there being a bias in the AER's method as an estimate of actuarially expected inflation.

3 Targeting a real cost of equity

13. The RoRI uses the CAPM to estimate the cost of equity and the CAPM is a real model – in the sense that all returns are specified in inflation adjusted terms. However, the application of the RoRI results in a nominal return on equity. To arrive at an economically meaningful estimate of the real cost of equity it is necessary that any inflation compensation embedded in the nominal return on equity (from the RoRI) is removed in the PTRM.

14. The only place that inflation compensation enters the nominal cost of equity from the RoRI is via the nominal risk-free rate. This means that the objective of the PTRM remove the same inflation compensation that is embedded in the nominal risk-free rate estimated pursuant with the RoRI.

15. The inflation compensation that is embedded in the nominal risk-free rate is the sum of both:

    - The actuarially expected level of inflation by bond investors; plus
    - Any inflation risk premium they demand due to being exposed to inflation risk (i.e., receiving a nominal return irrespective of actual inflation).

16. Both of these values will be 10-year values because that is the tenor of the risk-free rate. That is, a 10-year risk-free rate will have embedded in it a 10-year actuarially expected inflation estimate plus a 10-year inflation risk premium.

3.1 Why does an inflation risk premium exist and why does it vary

17. The economic literature documents a time varying and often material level of the inflation risk premium. When inflation is high the inflation risk premium is normally positive – meaning that bond investors typically demand an additional risk premium for investing in nominal assets. When inflation is low the opposite is true and investors typically accept a negative inflation risk premium nominal fixed return assets protect their portfolio from unexpectedly low inflation or deflation (which tends to be correlated with poor economic conditions).

3.1.1 Chen et. al. (2016)

18. US Federal Reserve researchers, (Chen et. al.) published a note in 2016,[1] that provides a helpful description of why there is an inflation risk premium in nominal risk-free rates and why it varies.

> *Inflation compensation is defined as the extra yield investors require to hold nominal assets that are exposed to inflation risk as opposed to those that offer a safe inflation-adjusted return such as Treasury inflation protected securities (TIPS).*

And

> *Measures of inflation compensation such as TIPS breakeven rates and inflation swap rates are related to market participants' expected rate of inflation by the relationship:*
>
> *Inflation compensation = expected inflation + inflation risk premium + other factors*

19. They then investigate, using a CAPM framework, the inflation risk premium as:

> *= market risk premium x beta (inflation compensation)*
>
> *where the function "beta" is the usual concept that is proportional to the correlation between inflation compensation and equity returns.*

20. Chen et. al. (2016) explain:

> *Conventional asset pricing theory suggests that the sign of risk premiums depends on the sign of the covariance of the returns of those assets with the typical investors' consumption or wealth. For example, stocks require a high positive risk premium because equity prices tend to fall during recessions, precisely when consumption also falls. Assets with payoffs tied to inflation are often modelled in this way too.*

21. The authors go onto explain that the beta for inflation exposure was typically positive in higher inflation periods but has fallen with the advent of inflation targeting and become negative in the post financial crisis period of low inflation.

[1] Chen, Engstrom and Grishchenko, *Has the inflation risk premium fallen? Is it now negative?* (2016) FEDS Note https://www.federalreserve.gov/econresdata/notes/feds-notes/2016/has-the-inflation-risk-premium-fallen-is-it-now-negative-20160404.html

> *To sum up, this note points out that standard consumption-based asset pricing models and the capital asset pricing model suggest that the long run inflation risk premium has trended down over time, and is likely to be negative in the current macroeconomic environment. Moreover, a nontrivial portion of the decline in far-forward inflation compensation over the past year may reflect a decline in the inflation risk premium rather than a drop in investors' expected inflation rate.*

3.1.2 Sapere (2020)

22. Sapere follow precisely the same logic in their advice to the AER. In para 81 and Appendix I Sapere make the following points:

    a. The CAPM is a real model and, therefore, the risk-free rate needs to be the expected return on a risk-free asset that has zero inflation risk (a real risk-free asset).

    b. The AER starts with a nominal risk-free rate and subtracts expected inflation as to arrive at a proxy for the real risk-free rate.

    c. This will not be accurate if there is any inflation risk premium embedded in the nominal risk-free rate..

    d. The correct adjustment to the nominal risk-free rate to derive the real risk-free rate requires the deduction of both:

        i. expected inflation; and

        ii. any the inflation risk premium.

23. Paragraph 81 states:

> *The method of estimating the nominal WACC and the AER's approach to estimating inflation are out of scope for this report and are taken as given.* ***However, it should be noted that the SLM-CAPM does not address uncertain inflation, which results in the nominally risk-free asset having a risky real rate of return.*** The CAPM with uncertain inflation is derived in Appendix I.. *(*Emphasis added)

24. Appendix I makes (algebraically) clear that the nominal risk-free rate less expected inflation is equal to the true real risk-free rate plus any inflation risk premium built into the nominal risk-free rate.

25. Equation (1) of Appendix I is the standard Sharpe CAPM formula – with a real risk-free rate and an inflation risk premium (IRP) relative the real risk-free rate. Equation

(2) applies equation (1) to the nominal risk-free rate. We set out Sapere's equation (2) in words below.

Expected real return on nominal RFR	=	*Nominal RFR*	-	*E(infl.)*	=	*True real RFR*	+	*IRP*

26. It follows that, to derive the true real return on equity the PTRM must remove both expected inflation (E(infl.)) and the inflation risk premium (IRP) built into the nominal risk free rate. That is, rearranging Sapere's equation (2) to solve for the true real RFR gives.

True real RFR	=	*Nominal RFR*	-	*E(infl.)*	-	*IRP*

3.2 Implication for regulatory models and methods

27. The current regulatory models and methods seek to protect NSP equity investors from inflation risk.

28. The inflation risk premium applies only to nominal assets - not real assets. The current regulatory design means that the equity portion of the RAB is unambiguously a real (inflation indexed) asset. That is, the equity portion of the RAB is subject to the risks of, and requires a return consistent with, a real asset. This does not include any exposure to inflation risk and, therefore, the targeted real return should not include any inflation risk premium.

29. Given that the nominal risk-free rate, estimated pursuant to the RoRI, includes both actuarially expected inflation and an inflation risk premium, it follows that the PTRM inflation should seek to remove both of these elements of inflation compensation from the nominal return on equity.

30. It would be economically illogical for the PTRM to remove more/less inflation from the nominal RoE than is actually embedded in the nominal risk-free rate. Failing to remove any inflation risk premium will result in equity investors being compensated 'as if' they face inflation risk when the regulatory regime explicitly does the opposite (i.e., delivers a real not a nominal return).

3.3 Bias relative to what?

31. There has, in current and past regulatory consideration of PTRM inflation, been much discussion of bias in various methods for estimating PTRM inflation. For example, Deloitte (2020) concludes that market-based measures, including inflation

swaps, are inferior to the AER method because inflation swaps, and bond break even inflation, have. [2]

"biases and risk premia may affect the resulting estimate"

32. This conclusion is, at least in part, based on the fact that market based estimates of expected inflation include the inflation risk premium built into low risk nominal rates (nominal risk-free rates and nominal fixed legs of a CPI swap).

33. By contrast, Deloitte concludes that the AER's method: [3]

Contains no significant biases and/or distortions.

34. While Deloitte's reasoning for this conclusion is not fully developed, this conclusion is clearly, in part, because the AER method is unaffected by movements in the inflation risk premium.

35. Deloitte is correct that the existence of inflation risk premia makes market measures biased estimates of actuarially expected inflation. However, it is equally clear that the existence of inflation risk premia makes the AER method, which ignores the inflation risk premium, a biased estimate of inflation compensation embedded in the nominal risk-free rate.

36. Deloitte proceeds on the basis that it is the former bias that is problematic. However, for the reasons explained in the previous section, it is my opinion that the latter bias is problematic. That is, PTRM inflation needs to include, not exclude, the inflation risk premium embedded in the nominal risk-free rate. This means that the alleged source of bias in market measures of inflation is not, in fact, a bias relative to what PTRM inflation should be estimating (consistent with the equity investment in the RAB being an inflation protected "real" asset).

37. I have reached this conclusion based on an understanding of: a) how the nominal cost of equity and debt is calculated pursuant to the RoRI; b) how the PTRM is structured; c) how inflation indexation is applied to revenues and in the RAB RFM; and d) how all of these elements combine to deliver a real return on equity.

38. Sapere has similarly had regard to the same factors and reached the same conclusion (as explained in section 3.1.2 above).

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[2] Deloitte, p.10

[3] Deloitte p.10

4 Targeting a real cost of debt

39. This section analyses how the regulatory models and methods can fit together to deliver economically meaningful real returns on debt dependent on whether:

    - Debt is incurred in nominal terms; or
    - Debt is, or can be assumed to be, incurred in real terms.

40. I conclude that the current models and methods do not result in an economically meaningful real return consistent with either of the above.

4.1 If debt is incurred in nominal terms – how should the real cost of debt be estimated?

41. In contrast to equity, the RoRI does not estimate the nominal cost of debt based on a single observed bond yield. Rather, the RoRI estimates the cost of debt based on the historical average of a number (up to 10) different observations of bond yields. Each of these observations embeds in it different inflation expectations and different inflation risk premia unique to the period the observation was taken.

42. If one accepts that NSP debt costs estimated in the RoRI are fundamentally nominal in their economic nature this has important implications for how PTRM inflation should be applied to the debt portion of the RAB. (Section 4.2 below will examine the correct approach in the alternative where NSPs do, or should be assumed to, fund themselves with real debt.)

43. One answer is that PTRM and RAB RFM inflation applied to debt should be set the same so that a nominal return is ensured no matter the inflation outcomes (i.e., the hybrid adopted). This will ensure that nominal debt costs are correctly compensated – even if PTRM inflation does not match actual inflation. However, as already stated, my focus is on any needed reforms to the current models and methods assuming the hybrid is not adopted (i.e., assuming the RFM remains unchanged).

44. Specifically, my focus is on how a real return on debt should be estimated from a nominal cost of debt in order that there is the expectation (not the certainty) that the nominal cost of debt will be compensated.

45. In this case, given we start with a nominal cost of debt (as the RoRI currently does) the question is what should the PTRM attempt to remove, step 2 of Figure 2-1 above, from the nominal cost of debt? I conclude that the answer is that the PTRM should attempt to remove the inflation compensation that is expected to be added back in

step 3 of Figure 2-1 (i.e., via revenue and RAB indexation to actual inflation over the next 5-years).

46. This means that PTRM inflation, as applied to the debt portion of the RAB, must be forecast at a 5-year horizon. This ensures that, in expectation if not in certainty,[4] the nominal compensation provided by the regime (RoRI, PTRM, and inflation indexation of revenues and RFM) will actually return us to the starting point (the nominal cost of deb estimated in the RoRI).

47. This is the approach applied by Ofgem which subtracts a 5-year inflation forecast from a 10-14 year trailing average of nominal debt costs to arrive at a real cost of debt for the regulatory period.[5] Lally also provides a mathematical proof that, if the PTRM discount rate is a nominal discount rate, then PTRM inflation, used to derive a real return, must anticipate inflation over the term of the regulatory period in order that the NPV=0 principle is satisfied. I examine this proof in more detail in Appendix A.[6]

48. The following stylised example describes how the AER's current regime results in any difference between 10 and 5-year inflation expectations being removed from the expected nominal compensation for the cost of debt.

4 After all, actual inflation may turn to different to the 5 year ex ante estimate.

5 Ofgem, RIIO-2 Draft Determinations – Finance Annex, 9 July 2020, See summary of "consultation position" on p.13

6 Where I also amend it to show that if the discount rate is real (as it is for equity) this conclusion does not hold and, instead, the objective of PTRM inflation should be to remove inflation compensation built into the nominal return on equity. Given that this is based on a 10 year nominal risk free rate, this implies PTRM inflation applied to the cost of equity should be 10 years.

Table 4-1: Stylised numerical example of current approach

Variable	Role in AER models	Algebraic designation	Value
Nominal TA RoD	Input to PTRM	A	3.0%
10-year expected inflation	Input to PTRM	B	2.0%
AER "real" RoD	Output of PTRM	C (=A-B)	1.0%
5-year expected inflation	Expected input to RFM/revenue indexation	D	-1.0%
Expected nominal RoD compensation	Expected output of AER models	E (=C+D=A-B+D)	0.0%
Difference "input" nominal cost of debt and output nominal compensation		F (=E-C=D-B)	-3.0%

49. This example illustrates that a +3% nominal cost of debt input into the PTRM is turned into zero expected nominal compensation for the cost of debt if the 10-year expected inflation is 3% higher than 5-year expected inflation.

50. That is, even if inflation turns out to be exactly as expected (zero forecast errors) the combined AER models will deliver nominal compensation for debt costs that is different to the estimate of nominal debt costs from the RoRI. This cannot be an appropriate outcome if the RoRI reflects efficient debt funding costs. It implies that an NSP will not recover their debt costs even if the NSP contracts at precisely the rates that the AER estimates are cost reflective and even if inflation is exactly as the AER predicts will occur.[7]

51. While the above example is hypothetical, the below example is a real-world application. In its 2020 regulatory decisions for SAPN, JGN and EQ the AER estimated 10-year inflation for to be 2.27%. However, the 5-year inflation forecast (using the AER method) would have been 1.80%.

52. Even if inflation follows exactly the AER method's predicted path, the 47bp difference between 5 and 10-year expected inflation will be removed from the nominal

[7] As already discussed, when expected inflation is lower over 5 years than 10 years it is perfectly appropriate that the expected nominal compensation for equity is lower than the PTRM nominal cost of equity input. This is because the nominal cost of equity input to the PTRM includes the 10 year inflation compensation embedded in it. Therefore, to derive a real risk free rate (one that is free from any inflationary impact) we must remove 10 year inflation compensation. Having done this, all we care about is the real return derived. It does not matter for that real return whether nominal returns over 5 years are different to those expected over 10 years.

compensation for these businesses over the 2020-25 regulatory period. That is, even if the AER's forecast method is perfectly accurate, 47bp greater inflation compensation will be removed in the PTRM than is added back in the RAB RFM and revenue indexation.

53. Because 60% of inflation on RAB is removed at 2.27% but only 1.80% of inflation is added back, the difference is lost forever and not compensated in the RAB at a later time.

Table 4-2: Real world (SAPN, JGN, EQ) numerical example

Variable	Role in AER models	Algebraic designation	Value (of return)
Nominal TA RoD	Input to PTRM	A	A
10-year expected inflation	Input to PTRM	B	2.27%
AER "real" RoD	Output of PTRM	C (=A-B)	A-2.27%%
5-year expected inflation	Expected input to RFM/revenue indexation	D	1.80%
Expected nominal RoD compensation	Expected output of AER models	E (=C+D=A-B+D)	A-0.47%
Difference "input" cost of debt and expected output compensation		F (=E-C=D-B)	-0.47%

54. There is nothing that these NSPs can do, or could have done, to avoid this loss. Even if the businesses had issued inflation indexed debt, it would still have been exposed to this loss of 47bp pa on its cost of debt (see section 4.3 below).

55. It is also worth noting that the current regulatory methods and models effectively impose a 5-year pay fixed/receive floating CPI swap on NSPs. NSPs pay the fixed leg of the swap in the form of PTRM inflation (removed from nominal debt returns) and receive the floating leg (in the form of indexation of debt costs in the RFM and revenues).

56. However, instead of the fixed leg of this regulatory swap contract reflecting market rates the fixed leg is whatever the PTRM inflation estimate is. To the extent the PTRM inflation estimate is different to the 5-year CPI swap rate the regulatory regime can reasonably be thought of as forcing NSPs to accept a CPI swap at non-market rates.

57. To the extent that the market price represents a fair price for taking on the same risks the NSPs are bearing, this would suggest that PTRM inflation applied to the debt portion of the RAB should give at least some weight to 5-year inflation swaps.

> **Key conclusion**
>
> If debt is a nominal cost that is, nonetheless, to be turned into a real cost, the PTRM must remove the same value of inflation compensation as the value it expects to add back in revenue/RAB indexation. That is inflation over the 5-year regulatory period.
>
> This differs from equity because equity is a fundamentally real cost. For equity, the objective is not to set a real return that is expected to yield the starting nominal cost. For equity, the objective is to estimate and target the real cost (based on the best estimate of the real risk-free rate)

4.2 If debt is incurred in real terms – how should the real cost of debt be estimated?

58. As it stands, the trailing average nominal cost of debt estimated in the RoRI is an average of up to 10 different nominal yields (each with different inflation expectations and inflation risk premia attached). There is no attempt within the RoRI to estimate the costs of NSPs issuing real (inflation indexed) debt.

59. By contrast, if debt is (or should have been) incurred by NSPs in real terms then the RoRI is not accurately reflecting this.

60. In this case, the objective must be to estimate the costs of issuing real (inflation indexed debt). If this were done in an internally consistent manner the RoRI would need to be amended to estimate a trailing average of the real cost of debt. That is, each debt observation in the trailing average would be a real yield observation.

61. PTRM inflation applied to the cost of debt in the RFM would then be zero. That is, there would be no need to subtract inflation from the cost of debt because it would already be in real terms.

4.2.1 Applied historically, the AER method underestimates real yields on inflation indexed corporate bonds

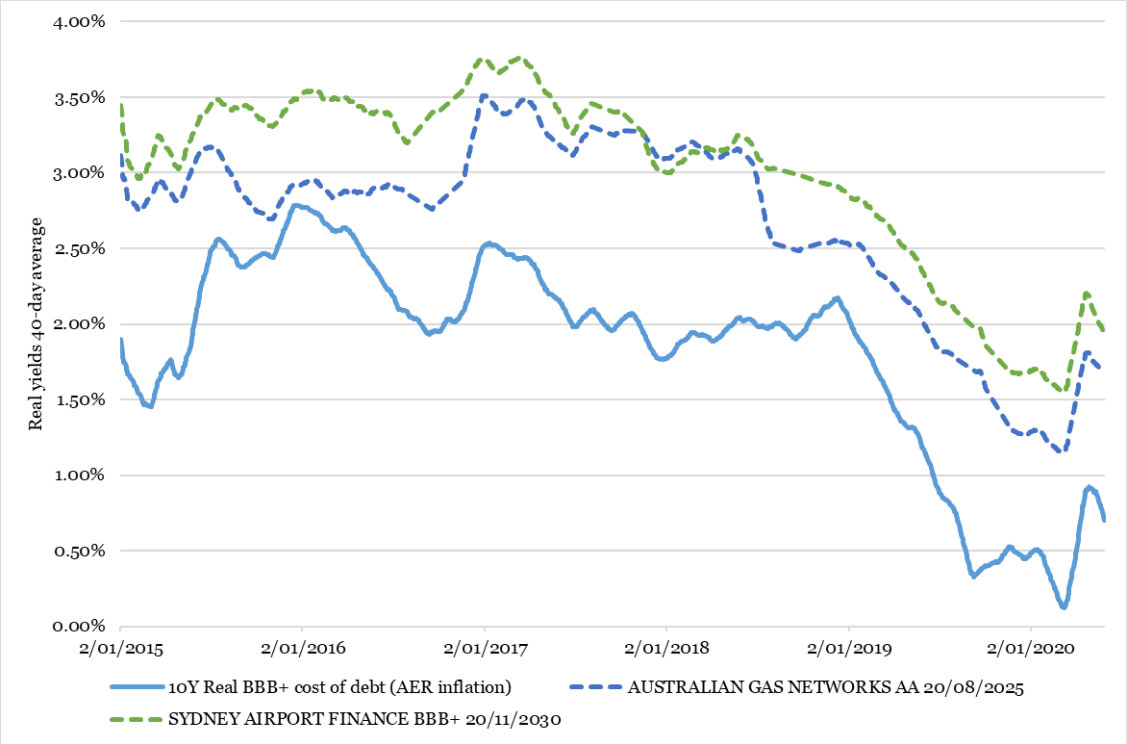
62. The paucity of corporate issues of inflation indexed debt suggests that there is little demand for such debt in credit markets and that, therefore, it would be more costly for NSPs to fund themselves in this way. This is borne out in Figure 4-1 below which compares time series for: the estimate of the real cost of debt applying current

methods historically; versus the real yields on the only two bonds, as reported by Bloomberg, issued by Australian infrastructure businesses with maturity beyond 2020. These two corporate bonds are:

- An AA rated bond maturing in 2025 issued by AGN; and
- A BBB+ rated bond maturing in 2030 issued by Sydney Airport.

63. The real yield on the former is typically 50-100bp higher yield than the real cost of debt estimated by the using the AER's current regulatory models and methods. This is despite it being much shorter maturity than 10-years over the period examined and a higher credit rating than BBB+. The real yield on the latter BBB+ rated bond is typically than 100+bp higher than the estimate of the real yield implied by regulatory practice.

Figure 4-1: Inflation indexed infrastructure yields vs estimate of real cost of debt implied by regulatory practice (40 day average)



64. The real yield estimated from regulatory practice is derived by assuming nominal BBB+ debt issues and then subtracting regulatory expected inflation. The fact that

this is universally lower than real yields actually observed on inflation indexed corporate bonds implies either:

- It would be higher cost to issue inflation indexed debt than nominal debt. This suggests issuing inflation indexed debt would be inefficient (if one assesses efficiency based solely on minimising costs).
- Second, if it is, nonetheless, efficient to issue inflation indexed debt[8] the AER's method does not appear to provide adequate compensation for the costs that would be incurred from pursuing that strategy.

65. If the first, this suggests that it should be accepted that NSPs efficiently issue nominal debt. If the second, the regulatory models and methods should be amended to raise the estimate of real debt costs materially in order to compensate for the higher costs of funding with real inflation indexed bonds.

4.3 The current methods and models achieve neither objective

66. The AER's current models and methods neither:

- Estimate the cost of a nominal debt issuance program and turns this into a real target return over the regulatory period; nor
- Estimate the cost of a real debt issuance program.

67. What the AER's models and methods actually do is start with a trailing average of nominal debt costs over 10 historical years then deduct a 10-year estimate of expected future inflation at the beginning of the regulatory period. This results in a real return that does not:

- bear any relation to the real debt costs that an NSP would incur if they funded themselves using inflation indexed debt. To achieve this objective the AER would have to remove a 10-year trailing average of expected inflation;[9]

nor does it

- result in an expectation that the nominal cost of debt estimated pursuant to the RoRI will be recovered. This is true even if actual inflation exactly matches the

8 For example, due to factors other than cost minimisation.

9 And the AER would need to add a liquidity premium to reflect the difference in real yields between nominal and inflation indexed corporate debt.

AER 10-year forecast. This is because actual compensation for inflation is provided in the AER models over 5-years not 10-years.

68. There is considerable misunderstanding on this point. The following passage from Sapere suggests a misunderstanding by both Sapere and the AER of what the current models and methods actually do when they are combined.

> *140. The AER observed that by targeting the overall rate of return, financing decisions remain the concern of the service provider, who bears the benefit or detriment of all such decisions (on the appropriate gearing level, whether to issue fixed or floating debt, whether to issue domestically or overseas, and so on) (Australian Energy Regulator, 2017, p. 88). The AER concluded that the current approach "appropriately assigns any risk arising from these financing decisions to the service provider, rather than consumers". It observed that when inflation causes the real return to equity holders to drop below the initial target, the real return to debt holders rises above the initial target-**noting that this outcome is a consequence of the decision of the NSP to issue nominal debt.*** (Emphasis added)

69. This passage assumes the current regime compensate NSPs based on a trailing average of real debt costs. As noted at paragraph 67 above, this is not the case.

70. The current methods and models do estimate and target a "real" level of compensation for the cost of debt. It is just that this "real" estimate will generally not be an economically meaningful estimate. The only circumstance in which the current methods and models do accurately compensate (in expectation) debt funding costs is where: a) debt funding costs are nominal in nature; and b) 10 year inflation expectations are, by coincidence, the same as 5 year inflation expectations.

4.4 Graphic summary of decision tree for the cost of debt

71. The above quote from Sapere suggests that both it and the AER believe that the current regime compensates for the costs of a real debt issuance program. In terms of Figure 4-2 below, this is a belief that the regime is sitting at position 2b. However, in reality, the current methods and models occupy the spot 4. in the below graphic.

72. In Figure 4-2, the move from 1. to 2a. follows from the RoRI estimating nominal debt costs. The move from 2a. to 3b. (rejecting the hybrid[10]) follows from the fact that the

[10] Which would ensure PTRM inflation equalled RFM inflation for the cost of debt portion of the RAB

current regime makes the recovery of the nominal debt costs dependent on the accuracy of PTRM inflation matching actual inflation.

73. Finally, the current PTRM forecast is for a 10-year horizon. Consequently, even if actual inflation in each year of the regulatory period exactly matches the AER predictions, the nominal cost of debt will be over/under compensated whenever 5-year expected inflation is above/below 10-year expected inflation. This shifts the current approach from 3b. to 4.

Figure 4-2: Summary of decision tree for the cost of debt

Appendix A Lally's proof that PTRM inflation should be 5 years

74. Dr Lally proves, on pages 4 and 5 of his report, that PTRM inflation must anticipate inflation over the regulatory period in order to satisfy the NPV=0 result.

75. I agree that Dr Lally's proof is well constructed and valid. However, I note that it implicitly assumes that the discount rate is a nominal discount rate. This means that for the cost of debt, which I agree is a nominal cost, Dr Lally and I agree that the PTRM inflation (used to index the debt portion of the RAB) should reflect expected inflation over the course of the regulatory period.

76. However, Dr Lally's proof does not apply to equity given that equity is a real cost. I use the framework established by Dr Lally to show that PTRM inflation applied to equity should be estimated over the same horizon as the risk-free rate (10 years).

A.1 Lally's proof applied to nominal costs

77. Dr Lally has a simplified model with no building blocks other than capital returns and zero depreciation/capex and with a single year regulatory period. In this model, the value of the opening RAB (A_o) must equal the present value of nominal expected revenues plus the expected indexed value of the opening RAB ($A_o[1 + E(i_1)]$).

$$A_o = \frac{E(REV_1) + A_o[1 + E(i_1)]}{1 + k_0} \qquad (1)$$

78. From this incontrovertibly correct position, Lally simply rearranges terms to derive the correct real rate of return consistent with the NPV=0 condition (equation 1).

$$E(REV_1) = A_o[k_0 - E(i_1)] \qquad (2)$$

79. Equation 2 is the cash return that the PTRM must deliver such that, in combination with indexation in the RFM (equation 1), the NPV=0 principle.

80. Lally's equation (2) proves that the NPV=0 principle requires that PTRM revenues must be derived by deducting the same inflation that is expected to be added to the RAB (i.e., $E(i_1)$).

A.2 Lally's proof applied to real equity costs

81. Lally's proof can also be applied to real costs. However, we need to replace k_0 with real discount rate k_0^r and we need to divide the right hand side of equation (1) by one plus expected inflation $(1 + E(i_1))$ to convert into real terms.

$$A_o = \frac{E(REV_1) + A_o[1 + E(i_1)]}{(1 + k_0^r)(1 + E(i_1))} \qquad \text{(1 real)}$$

82. Now, when we solve for $E(REV_1)$ by rearranging the real version of Lally's equation (1) we get the following.

$$E(REV_1) = A_o \cdot k_0^r \cdot [1 + E(i_1)] \qquad \text{(2 real)}$$

83. Equation "2 real" shows that the PTRM must deliver cash returns that are equal to the real discount rate (k_0^r) indexed by actual inflation over the course of the course of the regulatory period.

84. When costs and discount rates are real, Lally's amended proof simply requires that the PTRM delivers an economically sensible value for k_0^r. As described in section 3, this requires that the PTRM remove 10 year expected inflation from the nominal cost of equity because the nominal cost of equity has 10 year of expected inflation embedded in it (via the nominal risk free rate estimated pursuant with the RoRI).

A.3 Summary

85. This section shows that Lally's proof that PTRM inflation must match the term of the regulatory period only applies to debt. Lally's proof can be thought of as a mathematical framework similar to my Figure 2-1 in section 2. In that section I explained that, in terms of targeting a real return, there are only two valid objectives for PTRM inflation .

    A. Remove the inflation compensation embedded in the nominal cost estimated pursuant to the RoRI (step 1 in Figure 2-1)? or

    B. Remove the inflation compensation expected to be provided via revenue/RAB indexation (step 3 in Figure 2-1)?

86. In this report I have explained that the answer depends on whether the costs estimated in the RoRI have been incurred in nominal or real terms. I have argued that if the costs are real (equity) then "A" is the correct objective but if the costs are nominal (debt) then "B" is the correct objective.

87. Lally mathematically proves my position in relation to nominal costs. I amend Lally's proof to also prove my position in relation to real costs.