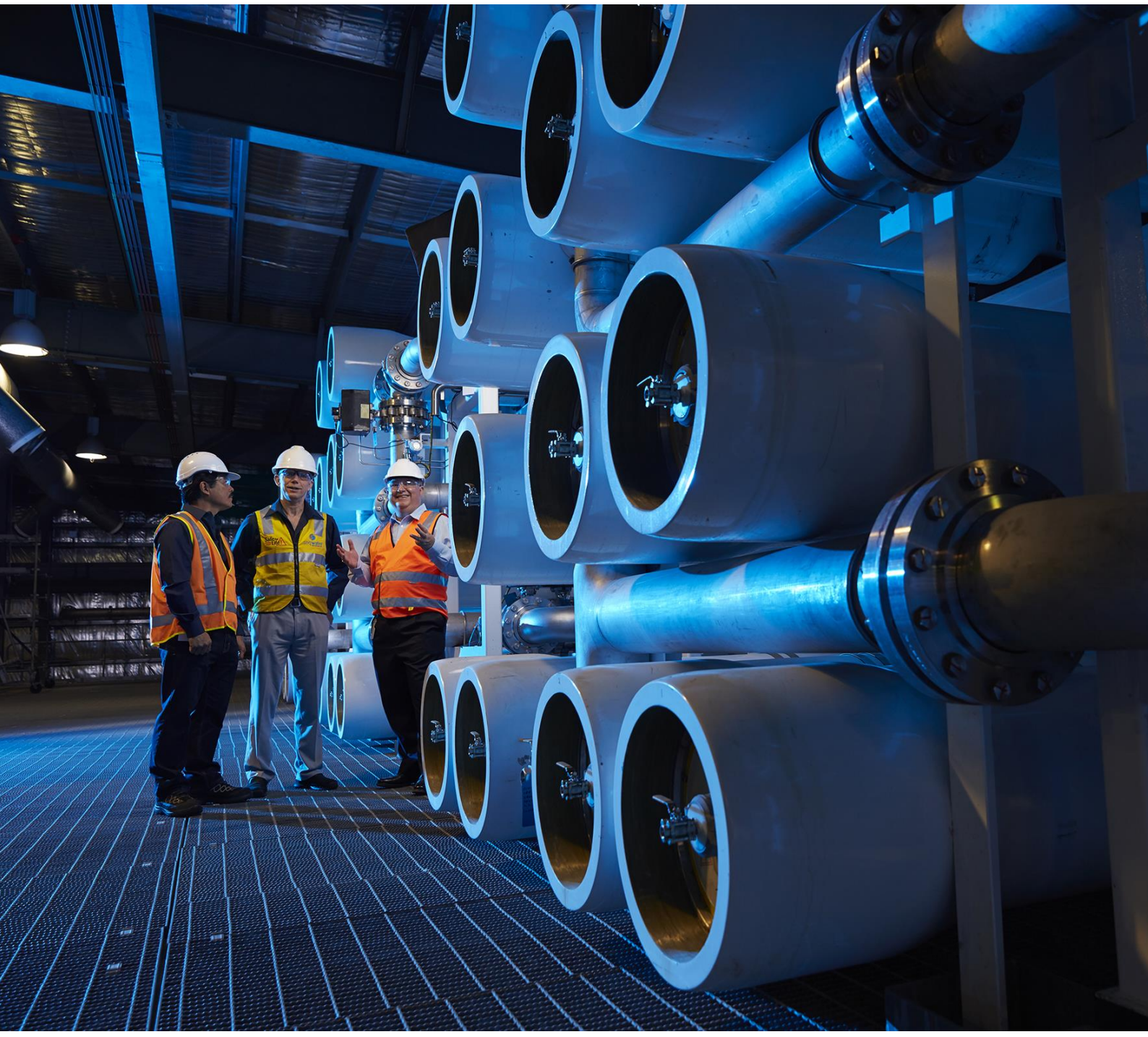
QCA Review of Inflation Forecasting Methodology 2021

Seqwater response to Issues Paper



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1.1 Background

On 18 March 2021, the QCA published an issues paper in relation to its review of its approach to estimating expected inflation for use in its regulatory models.[1]

This submission sets out Seqwater's views about the approach that is best suited to estimating expected inflation for regulatory purposes, and provides responses to the specific consultation questions posed by the QCA in the issues paper.

1.2 Summary of Seqwater's views and submissions

There are two separate issues, one of which is the focus of this review process

Seqwater considers that there are two problems with the QCA's current approach to regulatory inflation

- **The debt allowance problem:**

  Under the existing regulatory arrangements, Seqwater effectively receives a real cash return on debt allowance in each regulatory period. That is, the cash allowance is sufficient to pay only a real return on debt. However, Seqwater has prudently and efficiently raised nominal debt and is therefore contractually required to pay a full nominal return on debt in each regulatory year. Thus, the real regulatory allowance does not match the prudent and efficient nominal costs of servicing debt.

- **The inflation forecasting problem:**

  In the current financial market conditions, the QCA's current approach to forecasting inflation produces outputs that have produced implausibly high forecasts of inflation over the past decade—in the context of the way that parameter is used in the QCA's regulatory process.

It is the second of these two problems that is the focus of this review process, and consequently of this submission.

The "take out what we expect to put back in" framework

The QCA's regulatory framework uses inflation in two places. In the first step, the QCA estimates the nominal required return on capital and then deducts a forecast of the inflationary gain in the regulatory asset base (RAB) over the regulatory period. The remainder is provided to the regulated business via the annual revenue allowance. In the second step, the RAB is indexed using actual inflation observed over the regulatory period.

This same framework is used by other Australian regulators, where it is known as the "take out what we expect to put back in" framework. In this regard, the NPV=0 principle requires that what is 'taken out' must be consistent with what is expected to be 'put back in.'

The inflation estimate must reflect the length of the regulatory period

One of the implications of the "take out what we expect to put back in" framework is that expected inflation must be estimated *over the term of the regulatory period*. Because what is added back in the second step is observed inflation *over the term of the regulatory period*, what is deducted in the first step must be expected inflation *over the same regulatory period*.

[1] QCA, *Inflation forecasting, Issues Paper*, March 2021 ('issues paper').

Under this framework, there is no link at all between the regulatory estimate of expected inflation and the term that is assumed when setting the allowed return on debt or equity.

The AER reached the same conclusions in its recent Review of Regulatory Inflation.

The approach that produces the best forecast of actual inflation should be adopted

Another implication of the "take out what we expect to put back in" framework is that what is required is the best possible forecast of *actual inflation* over the regulatory period. Because it is actual inflation that is added back in one step, it must be a forecast of actual inflation that is deducted in the other step. Seqwater submits that the best possible forecast of actual inflation is an unbiased estimate of investors' inflation expectations over the regulatory period.

The QCA's current approach produces implausible forecasts of inflation over a forthcoming regulatory period

The body of this submission establishes that, in the prevailing market conditions, the QCA's current approach produces an estimate of expected inflation that is higher than any plausible estimate of inflation over a forthcoming regulatory period.

RBA forecasts have been systematically biased for over a decade

The body of this submission establishes that RBA forecasts of one-year-ahead and two-year-ahead inflation have been systematically upwardly biased for over a decade. It is relevant that such higher forecasts are likely to assist the RBA in achieving its policy function of increasing inflation towards its target zone.

Inflation swaps have provided superior estimates for over a decade

The body of this submission establishes that inflation forecasts from inflation swaps have been statistically superior to RBA forecasts for over a decade. Consequently, Seqwater submits that this market data is the preferred source of inflation forecasts.

Seqwater submission

Seqwater submits that the forecast rate of inflation for each year of the Regulatory Period should be determined using the 40-day average of the forward inflation rate for that year implied by traded zero-coupon Australian inflation swaps.

2 Two distinct issues in relation to the QCA's current approach to inflation

2.1 The role of inflation within the QCA's regulatory framework

The QCA determines the total return that Seqwater is allowed to earn using two steps:

- In the first step, the QCA estimates the nominal required return on capital and then deducts a forecast of the inflationary gain in the regulatory asset base (RAB) over the regulatory period. The residual amount, which may be thought of as 'real' return on capital allowance, is provided to the regulated business via the annual revenue allowance.
- In the second step, the RAB is indexed using actual inflation observed over the regulatory period.

The QCA explained this process in its 2018 final decision on Seqwater's prices:

> *The RAB is rolled forward for inflation, at a forecast inflation rate, to maintain the real value of those assets (Chapter 6). Given this adjustment, it follows that a deduction for inflationary gain is required from building block costs to avoid double counting.*[2]

This same framework is used by other Australian regulators. For example, the Australian Energy Regulator (AER refers to this as the "take out what we expect to put back in" framework, whereby a deduction is made for expected inflation in the first step and then actual inflation is added back in the second step.[3]

2.2 The QCA's current approach to forecasting inflation

The QCA's current approach to estimating expected inflation (for use in the first step of its regulatory framework) is to take a 10-year geometric average of annual inflation forecasts whereby RBA forecasts are adopted for the first two years, and the 2.5% mid-point of the RBA inflation target range is adopted for the remaining eight years.

For example, the QCA adopted this approach in its most recent review for Seqwater and in its recent rural irrigation price reviews.[4]

This approach always produces an estimate close to 2.5% because it adopts figures of 2.5% for eight of the ten years used in the averaging process.

2.3 Two distinct issues with the QCA's current approach

Seqwater does not have any in-principle concerns about the QCA's general approach of making a deduction for inflation in one step of its regulatory process and then adding back inflation in another step. However, Seqwater considers that there are two distinct problems with the way the QCA *implements* this approach:

- **The debt allowance problem:**

  Under the existing regulatory arrangements, Seqwater effectively receives a real cash return on debt allowance in each regulatory period. The QCA determines this real allowance by first determining the required nominal return and then making a deduction for expected inflation.

[2] QCA, *Seqwater Bulk Water Price Review 2018–21*, *Final Report*, March 2018, pp. 62-63.
[3] AER, *Final position: Regulatory treatment of inflation*, December 2020, p. 7.
[4] QCA, *Rural irrigation price review 2020–24 Part C: Seqwater, Final Report*, January 2020, p. 29.

However, it is almost universal for Australian infrastructure firms such as Seqwater to raise nominal (rather than real, inflation-indexed) debt. Hence, there is an insufficient cash allowance in each regulatory period for Seqwater to meet its contractual nominal debt obligations.

The shortfall between the real allowed return on debt capital and Seqwater's actual debt service costs must be made up by the equity holder. If actual inflation differs from the QCA's forecast, then the indexation of Seqwater's RAB would either be less/more than is required in order to meet the contractual obligations to debt holders of the benchmark efficient entity.

- **The inflation forecasting problem:**

  When calculating the inflationary gain to deduct from the return on capital in the first step of its approach, the QCA adopts an inflation forecast that is always close to 2.5% (the mid-point of the RBA's inflation target range) in each year of the forthcoming regulatory period, regardless of prevailing market conditions or actual inflation. However, actual inflation has been persistently lower than this level for more than a decade. Given the persistently low inflation environment and the current evidence that inflation is expected to remain low for some time, investors do not expect inflation to be 2.5%.

  This means that under the existing approach, the QCA deducts too high a forecast of the inflationary gain from the return on capital allowance, when setting regulated prices for each period. The outturn inflation added to the RAB is insufficient to compensate investors for the too-large deduction from the return on capital made by the QCA in the first step. Symmetrically, when investors' inflation expectations exceed the QCA's inflation forecast, then too little would be deducted when the return on capital allowance is set, and consumers would pay more than the efficient cost of delivering regulated services.

The debt allowance problem arises when the QCA's inflation forecast differs from *actual inflation*. The inflation forecasting problem arises when the QCA's inflation forecast differs from investors' *inflation expectations*.

Each of these problems needs to be considered and addressed separately. Seqwater notes that the current QCA consultation process relates to the inflation forecasting problem only. Consequently, that is the focus of this submission. We explain the nature of the debt allowance problem, and propose potential solutions, in the Appendix to this submission. We note that the Price Path Debt mechanism provides some protection to Seqwater against the debt allowance problem. However, as demonstrated in the Appendix, the debt allowance problem has contributed significantly to the build-up of Seqwater's Price Path Debt.

2.4 The inflation true-up applied to Seqwater

Seqwater notes that an ex-post true-up for the difference between observed inflation and forecast inflation is applied for Seqwater. The effect of this true-up is to protect Seqwater from the problems set out above as it ensures that whatever is 'taken out' in the first step of the QCA's approach is then 'put back' as a combination of RAB indexation and inflation true-up.

Seqwater makes this submission in the context of the QCA conducting a review of its general approach to regulatory inflation, noting that the inflation true-up mechanism does not apply to other entities regulated by the QCA.

Thus, the comments in the remainder of this submission pertain to the QCA's general approach to regulatory inflation, rather than to the bespoke true-up arrangements that have been applied to Seqwater.

3 The inflation forecasting problem

3.1 Overview and summary of Seqwater submission

As explained above, the QCA determines the total return that Seqwater is allowed to earn using two steps:

- In the first step, the QCA estimates the nominal required return on capital and then deducts a forecast of the inflationary gain in the regulatory asset base (RAB) over the regulatory period. The remainder is provided to the regulated business via the annual revenue allowance.
- In the second step, the RAB is indexed using actual inflation observed over the regulatory period.

The AER, which uses the same approach, refers to this as the "take out what we expect to put back in" framework.[5] In this regard, the AER explains that the NPV=0 principle requires that the deduction for inflation that occurs in the first step must be set equal to the expected adding back of inflation in the second step.[6]

Within this framework, it is clear that the inflation figure that is deducted in the first step must be equal to the expected inflation outcome over the term of the regulatory period. Because it is actual inflation over the term of the regulatory period that is added back in the second step, it must be the expected value of this that is deducted in the first step.

There are two clear implications that follow from the "take out what we expect to put back in" framework:

- Expected inflation must be estimated *over the term of the regulatory period*. Because what is added back in the second step is observed inflation over the term of the regulatory period, what is deducted in the first step must be expected inflation over the same regulatory period. This consistency is required to comply with the NPV=0 principle.
- What is required is the best possible estimate of *actual inflation* over the regulatory period. Because it is actual inflation that is added back in the second step, it must be a forecast of actual inflation that is deducted in the first step. Again, this consistency is required to comply with the NPV=0 principle. In Seqwater's view, the best possible estimate of actual inflation is an unbiased estimate of investors' inflation expectations over the regulatory period.

3.2 The "take out what we expect to put back in" framework

In its recent Review of Regulatory Inflation, the AER commissioned a report from Dr Lally in relation to several aspects of the approach to regulatory inflation.[7] Lally (2020) identified that the AER's Discussion Paper presented two contradictory rationales for the role of the regulatory inflation parameter:

- Regulatory inflation can be set to ensure that what is taken out of allowed revenues in the first step is equal to what is expected to be put back in via RAB indexation in the second step; or
- Regulatory inflation can be used to convert nominal allowed returns into real returns.

Lally (2020) explained that:

> *The AER (2020, pp. 10-12)[8] 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*

[5] AER, December 2020, Final position: Regulatory treatment of inflation, p. 7.
[6] AER, December 2020, Final position: Regulatory treatment of inflation, p. 45.
[7] Lally, M., 8 July 2020, *Review of the AER's inflation forecasting methodology*
[8] AER, May 2020, Discussion paper: Regulatory treatment of inflation.

> *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.*[9]

It is important to note that Lally (2020) identifies that the two rationales are contradictory. Indeed, they are mutually exclusive in that it is impossible to achieve both simultaneously.

In its Final decision, the AER explained that its regulatory framework (which is the same as that adopted by the QCA) is indeed based on what Lally considered to be the correct rationale – the "take out what we expect to put back in" approach:

> *It is only in the course of this review that we have identified the importance of matching the indexation in the RFM [RAB roll-forward model]. As such, we broadly agree with the ENA's proposition in its submission that it is appropriate to target an approach where 'we are take out what we expect to put back in', but with some minor deviations for items such as lags and other effects.*[10]

The AER went on to explain that this approach is necessary to meet the NPV=0 principle:

> *Jemena engaged CEG to review Dr Lally's advice to us. CEG agreed that adopting a 5 year term [the length of the regulatory period] is logical and consistent with what is required to generate NPV=0 outcomes.*[11] *We agree with CEG, that to achieve NPV=0 outcomes using the nominal rate of return as the required rate of return would require us to use a 5 year term approach.* [12]

3.3 Breaching the "take out what we expect to put back in" framework violates the NPV=0 principle

In this subsection, we consider an illustrative example where:

- The best possible expectation of inflation over the regulatory period is 1.5% p.a.; and
- The regulator adopts an inflation figure of 2.5%, based on expectations over (say) a 10-year period.

In this case, the equity investor is under-compensated by 1.0% p.a. on an *ex ante* basis. This is because:

- The regulator deducts 2.5% in the first step of their regulatory process; and
- Is expected to add back only 1.5% in the second step.

There are two important points to highlight in this example:

- The loss suffered by the investor, 1.0%, is exactly equal to the extent to which the regulator mis-estimated investors' true inflation expectations. The loss to the investor would not have arisen if the regulator had estimated inflation expectations correctly.
- In this example, the investor suffered a loss because the regulator had *over*-estimated inflation expectations, thereby deducting too much from the allowed nominal return. Had the regulator *under*-estimated the investor's inflation expectations, too little would have been deducted from the allowed

[9] Lally, M., 8 July 2020, *Review of the AER's inflation forecasting methodology,* p. 5.
[10] AER, December 2020, Final position: Regulatory treatment of inflation, p. 45.
[11] CEG, *Response to AER draft position paper on inflation - A report for Jemena*, November 2020.
[12] AER, December 2020, Final position: Regulatory treatment of inflation, p. 45.

nominal return, and the investor would have enjoyed a windfall gain. Consequently, consumers would have suffered a windfall loss.

- Any case where the *ex ante* expected return differs from the investor's required return is a breach of the NPV=0 principle.[13]

3.4 Implications for the term of the inflation estimate

One of the implications of the "take out what we expect to put back in" framework is that expected inflation must be estimated *over the term of the regulatory period*. Because what is added back in one step is observed inflation *over the term of the regulatory period*, what is deducted in the other step must be expected inflation *over the same regulatory period*. This consistency is required to comply with the NPV=0 principle.

Thus, for an entity with a five-year regulatory period, what must be taken out is the best estimate of expected inflation over that five-year period.

The AER reached the same conclusion in its recent review:

> *…in the draft position we considered that an inflation term tied to the length of the regulatory period is likely to result in the best estimates of expected inflation and contribute to the achievement of the NEO/NGO. This was because [a]dopting an inflation term that is the same length as the relevant regulatory period (typically, 5 years) would, in expectation match RAB indexation over the regulatory period. This is desirable because service providers will in expectation receive the same allowance during RAB indexation in the RFM as the amount (expected inflation) deducted from total revenue in the PTRM. Thus, service providers are expected to receive the nominal return set in the rate of return instrument over the regulatory period.*[14]

To further see why regulatory inflation should be estimated over the term of the regulatory period, consider the case where:

- All stakeholders agree that the best possible estimate of expected inflation is 1.5% for Year 1, 1.8% for Year 2, and 2.5% in every year thereafter; and
- Actual inflation turns out to be in line with expected inflation in every year.

In this case, the geometric mean of observed inflation over the five-year regulatory period is 2.16% and that reflects what will be 'put back' via RAB indexation. Thus, if the regulator estimates expected inflation over five years, 2.16% is taken out in the first step of the regulatory approach, and 2.16% is put back in the second step.

By contrast, consider the case where the regulator estimates expected inflation over a 10-year period. In this case, the 10-year geometric mean of 2.33% is deducted in the first step and 2.16% is put back in the second step. The resulting shortfall is never caught up because inflation is always constant at 2.5% in every subsequent year.

Thus, this example shows that:

- If the QCA estimates expected inflation over a term that differs from the length of the regulatory period; and
- Actual inflation turns out to be exactly in line with the QCA's forecast in every year;

[13] Seqwater notes that this submission pertains to the QCA's general approach to regulatory inflation, rather than the bespoke true-up arrangements that currently apply to Seqwater, as noted in Section 2.4 above.
[14] AER, December 2020, Final position: Regulatory treatment of inflation, p. 38.

- The NPV=0 principle is violated as the deduction for inflation in one step of the regulatory process does not match the adding back of inflation in the other step.[15]

Finally, it is important to note that, under the "take out what we expect to put back in" framework, the term for the inflation parameter is determined by the RAB roll-forward process and not the term of the allowed return on debt or equity. Since the RAB roll-forward process used by the QCA adds back inflation over the regulatory period, the revenue allowance must deduct expected inflation over the same regulatory period.

Under this framework, the term of the allowed return on debt or equity is irrelevant. The AER has recently reached the same conclusion:

> *At this time, it is not clear to us that the term for the inflation expectations needs to be aligned to that used for the determination of the rate of return.*[16]

3.5 Implications for assessing the quality of inflation forecasts

The appropriate test is the ability to forecast actual inflation

Another implication of the "take out what we expect to put back in" framework is that what is required is the best possible forecast of *actual inflation* over the regulatory period. Because it is actual inflation that is added back in one step, it must be a forecast of actual inflation that is deducted in the other step. Again, this consistency is required to comply with the NPV=0 principle.

Seqwater submits that the best possible forecast of actual inflation is an unbiased estimate of investors' inflation expectations over the regulatory period.

Various approaches for obtaining inflation forecasts can be assessed in terms of their ability to match future inflation outcomes. That is, the test is a simple one – which approach best forecasts future inflation outcomes?

In the remainder of this section, we examine the relative merits of different approaches for forecasting future inflation outcomes.

Forecasts based on the QCA's current approach

The RBA's most recent (February 2021) Statement on Monetary Policy indicates that the RBA is forecasting CPI inflation to be 1.5% over the year to June 2022 and 1.75% over the year to June 2023.[17]

The RBA warns that:

> *The pace of the recovery will continue to vary across economies and, in many, the recovery will remain incomplete over the forecast period. Underlying inflationary pressures are likely to remain subdued globally for some time given considerable spare capacity.* [18]

The RBA elaborates on that statement by explaining the following:

> *Underlying inflation pressures remain subdued and are expected to be fairly muted in the period ahead. Spare capacity in the labour market remains elevated, and wages growth has eased further from already low rates. Many employers have responded to the economic challenges of the pandemic by*

[15] For clarity, Seqwater notes again that this submission pertains to the QCA's general approach to regulatory inflation, rather than the bespoke true-up arrangements that currently apply to Seqwater, as noted in Section 2.4 above.
[16] AER, *October 2020, Draft position: Regulatory treatment of inflation*, p. 39.
[17] RBA, *Statement on Monetary Policy*, February 2021, Forecast Table – February 2021.
[18] RBA, *Statement on Monetary Policy*, February 2021, Section 5: Economic Outlook.

> *delaying wage increases, imposing wage freezes and, in some cases, applying temporary wage cuts. Forward indicators suggest wages growth will remain soft this year.*
>
> *Both underlying price inflation and wages growth are expected to remain below 2 per cent over the forecast period, out to mid 2023. Trimmed mean inflation is expected to be 1¼ per cent over 2021 and 1½ per cent over 2022. For inflation to be sustainably within the Bank's target range of 2–3 per cent, a period of labour market tightness that leads to faster wages growth is needed. However, even the latest, upgraded, forecasts for economic activity and employment still imply a degree of spare capacity and slow wages growth over coming years.19*

By contrast, the QCA's current approach produces a regulatory inflation forecast of 2.32%. In the current economic conditions, it seems highly unlikely that inflation will average 2.32% over a forthcoming regulatory period. Thus, under the QCA's current approach, inflation of 2.32% would be "taken out" of the revenue allowance with an expectation that something materially lower would be "put back in." This violates the NPV=0 principle and results in a permanent and unrecoverable loss to the owners of the firm.

For a four-year regulatory period, for example, inflation would have to be above 3% in each of Years 3 and 4 in order to average 2.32% over the four years. The suggestion that inflation would exceed the top end of the RBA target band, starting two years from now, is highly unlikely in the prevailing economic conditions. But that is what would have to occur in order for what is expected to be "put back in" to match what is "taken out" under the QCA's current approach.

Moreover, there is mounting evidence that the RBA has been consistently unsuccessful in moving inflation back towards its target level during the low-rate/low-inflation environment that has persisted over the last decade. And that it is likely to become even more difficult for the RBA to increase inflation in the future.

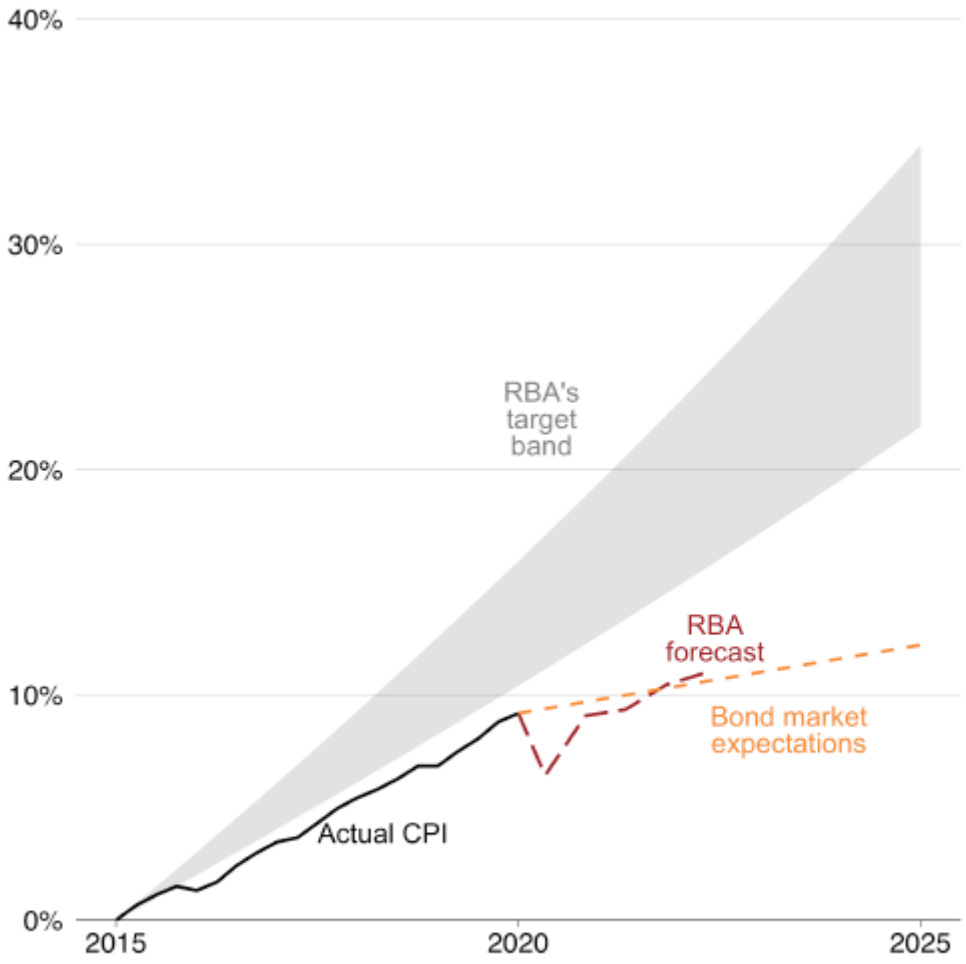
For example, the Grattan Institute has published a report that explored possible strategies for a post-Covid-19 recovery of the Australian economy. Figure 1 reproduces a chart presented in that report. In relation to that Figure, the Grattan Institute noted that:

> *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.* [20]

The Grattan Institute noted that, as shown in Figure 1, actual inflation had turned out to be persistently lower than the RBA's inflation target range. Indeed, the Figure shows that actual inflation has been well below the bottom of the RBA's inflation target range of 2.0% p.a. since 2015. The Grattan Institute also explained that the longer actual inflation remains below the target, the more challenging it becomes to return to the target range.[21]

[19] RBA, *Statement on Monetary Policy*, February 2021. Page 2.
[20] Grattan Institute, *The Recovery Book*, June 2020, Figure 3.10, p. 34.
[21] Grattan Institute, *The Recovery Book*, June 2020, Figure 3.10, p. 34.

Figure 1 RBA outturn inflation and forecasts



Notes: Bond market expectations refers to the compound average rate over five years. Calculated based on yields for Australian government securities. Yields at five-year maturity were imputed. Yields current as at 23 June 2020.

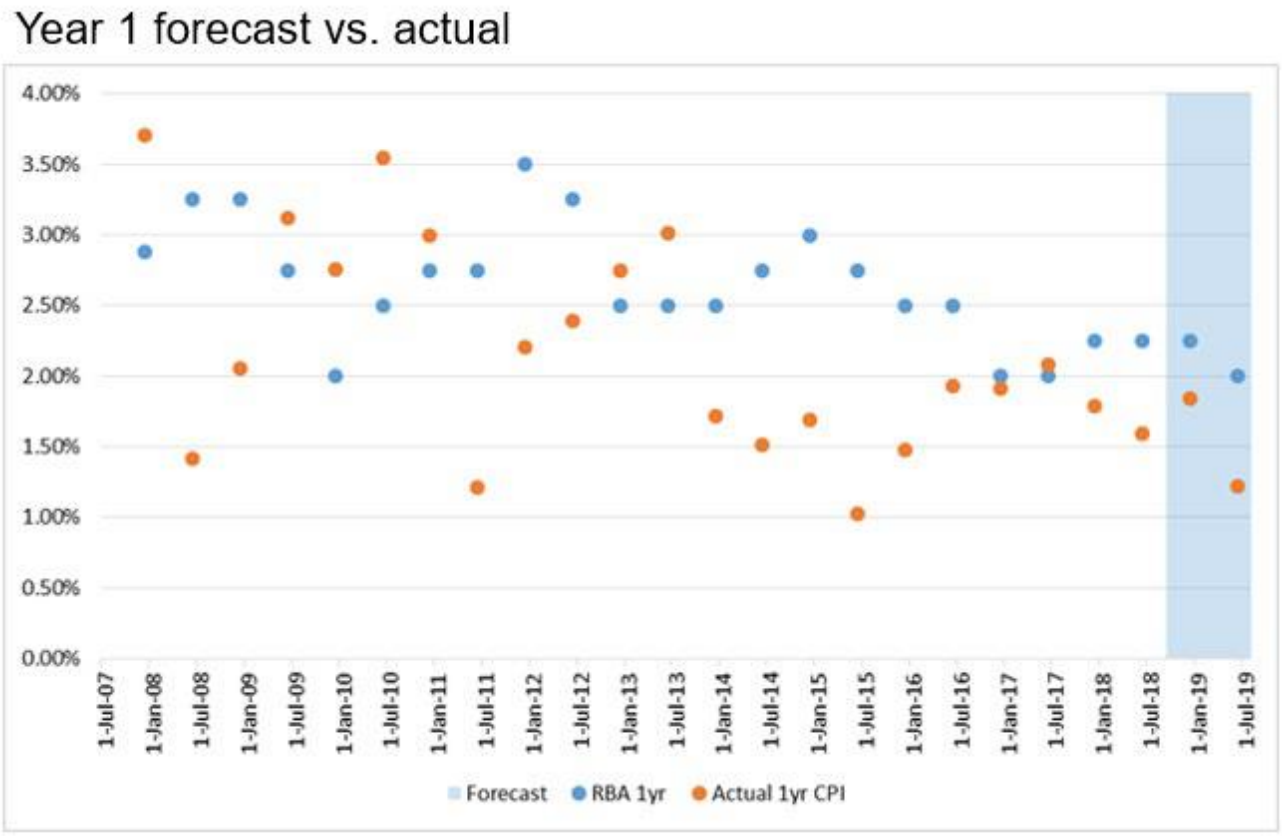
Sources: Grattan calculations based on RBA (2020a), ABS (2020i) and RBA (2020e).

Source: Grattan Institute, The Recovery Book, June 2020, Figure 3.10, p. 34.

Given all of the evidence set out above, it would seem highly unlikely that actual inflation could reasonably be expected to average 2.32% over a forthcoming regulatory period. For this reason, Seqwater submits that the QCA's current approach is inconsistent with the NPV=0 principle and the QCA should seek alternative approaches that are more likely to produce estimates that reasonably reflect expected inflation over a forthcoming regulatory period.

In addition to this, there is mounting evidence that the RBA tends to systematically over-forecast future inflation in the current low-rate/low-inflation environment. This evidence was summarised in the Energy Networks Australia (ENA) submission to the AER's 2020 Review of Regulatory Inflation. The ENA submission included evidence that is reproduced as Figure 2 below. This shows that the RBA forecasts have systematically exceeded actual inflation outcomes for more than a decade. The ENA submission documents a similar pattern in relation to the RBA's Year 2 forecasts.

Figure 2 RBA forecasts vs. actual inflation for that year



Source: ENA, 6 November 2020, Review of the regulatory treatment of inflation: Response to AER draft position paper, Figure 1, p. 30.

In relation to this evidence, the ENA concluded that:

> *…over the last decade, RBA forecasts have been persistently and materially higher than actual inflation outcomes. Thus, over that period, what would have been 'taken out' is materially more than the average of what would have been 'put back in' under the new approach.*
>
> *…although RBA forecasts might be unbiased over the long run, there appears to be a consistent upward bias in low-inflation conditions, such as we are experiencing now.*
>
> *Such a bias might eventuate from the fact that the RBA has a clear imperative to drive inflation upwards towards the target band. Illustrating a clear pathway back towards its inflation target band can affect market expectations and assist the RBA in achieving its policy objective.*
>
> *It is possible that the RBA's forecast of inflation is the best possible forecast and that outturn inflation has turned out to be below that forecast by random chance. Yet as we are approaching 10 years of consistent over-forecasting, it is becoming less likely that the difference can be explained by random chance and more likely that there is a systematic bias in low-inflation conditions.*[22]

[22] ENA, 6 November 2020, Review of the regulatory treatment of inflation: Response to AER draft position paper, p. 29.

Seqwater submits that this raises questions about whether the RBA forecasts should be used at all, at least in the prevailing financial market conditions. In particular, if other approaches exist which provide superior forecasts of outturn inflation, those superior forecasts should be used for the reasons explained above.

Inflation expectations implied by traded financial securities

A commonly-used method to infer investors' inflation expectations is by reference to zero-coupon inflation swaps. Inflation swaps are a type of financial instrument used by various market participants to hedge inflation risk (i.e., the risk that actual inflation will turn out differently to their expectation of inflation over a given time horizon). A zero-coupon inflation swap, involves two counterparties contracting bilaterally with one another in the following way:

- The first counterparty agrees to pay a pre-determined fixed rate of interest on a notional amount to the second counterparty upon maturity of the swap.
- The second counterparty agrees to pay the cumulative inflation over the period of the swap (using an agreed inflation index such as the CPI) to the first counterparty.

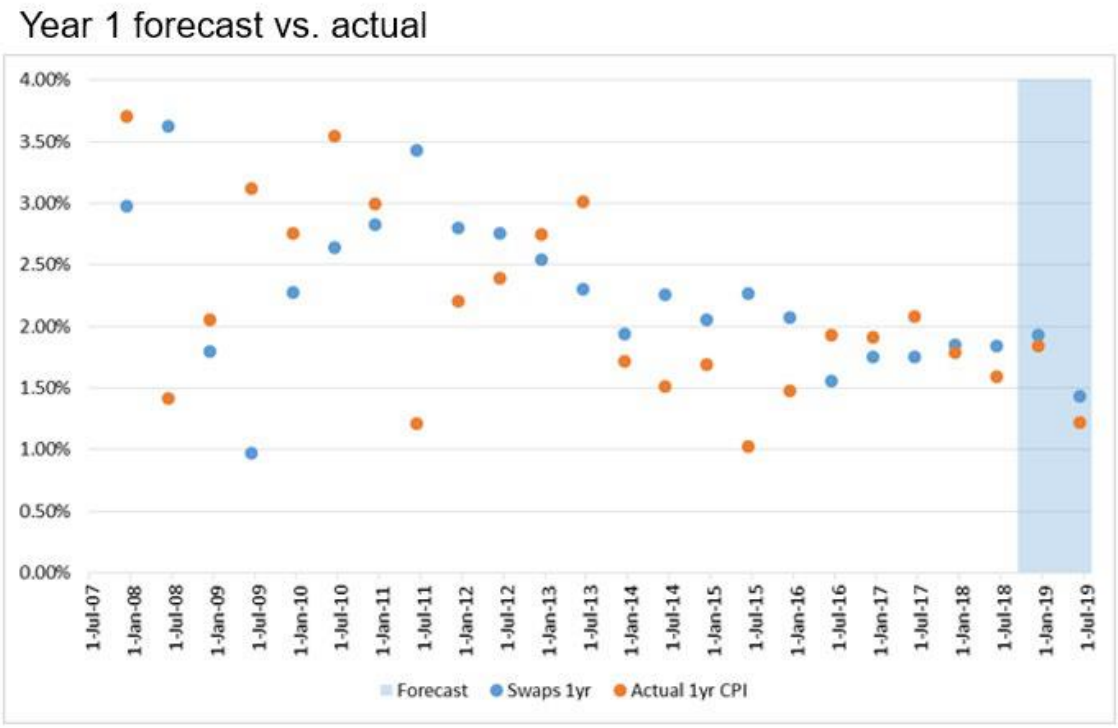
That is, the parties agree to 'swap' a set of fixed and floating payments. The fixed rate agreed in the fixed leg of the swap represents the expectation of the two counterparties of the rate of inflation over the period of the swap.

Since the payoff from this instrument depends on the extent to which actual inflation differs from the contracted swap rate, there is a strong incentive for both parties to ensure that the swap rate is not systematically biased in a manner that disadvantages them.

Moreover, when weighing up the reliability of various forecasts, it is relevant that real money changes hands on the basis of these instruments. This differs from surveys (for which there are no obvious cost to being systematically incorrect) and RBA forecasts (where a bias can assist the RBA in meeting its policy objectives).

The ENA submission to the AER's recent Review of Regulatory Inflation also compared forecasts based on inflation swap rates with actual inflation outcomes. The results are summarised in Figure 3 and Table 1 below. This evidence shows that, over the last decade, the inflation swaps forecast has been superior to the RBA forecast for year-ahead and two-year ahead inflation.

Figure 3 Inflation swaps forecasts vs. actual inflation for that year



Source: ENA, 6 November 2020, Review of the regulatory treatment of inflation: Response to AER draft position paper, Figure 2, p. 32.

Table 1 Forecast error: RBA vs inflation swaps

Time period	Root mean squared error		Mean absolute deviation	
	RBA	Swaps	RBA	Swaps
Year 1 forecasts	0.92%	0.72%	0.78%	0.52%
Year 2 forecasts	0.89%	0.74%	0.81%	0.58%

Source: ENA, 6 November 2020, Review of the regulatory treatment of inflation: Response to AER draft position paper, Table 2, p. 33.

Conclusions in relation to inflation forecasts

Under the "take out what we expect to put back in" framework, what is required is the best possible forecast of *actual inflation* over the regulatory period. Because it is actual inflation that is added back in one step, it must be a forecast of actual inflation that is deducted in the other step. Consequently, various approaches for obtaining inflation forecasts can be assessed in terms of their ability to match future inflation outcomes over the relevant regulatory period.

The approach that is currently adopted by the QCA (which mirrors the approach previously used by the AER) demonstrably produces poor forecasts of actual inflation outcomes over a forthcoming regulatory period. The current approach produces a forecast of 2.32% p.a., which requires inflation expectations above 3% in Years 3 and 4 of a regulatory period. No current forecast of any description suggests that forecasts in excess of 3% are reasonable.

Seqwater also submits that the RBA estimates of one-year-ahead and two-year-ahead inflation are systematically biased. Superior estimates (in a statistical sense) are available from market data in the form of inflation swap rates. Over the last decade, inflation swap rates have been more accurate in forecasting actual inflation outcomes relative to RBA forecasts.

Consequently, Seqwater submits that the forecast rate of inflation for each year of the Regulatory Period should be determined using the 40-day average of the forward inflation rate for that year implied by traded zero-coupon Australian inflation swaps.

4 Recent regulatory developments

Seqwater notes that, until recently, most regulators in Australia employed approaches to forecast inflation that were similar to the QCA's existing 'RBA geometric average' approach—namely, adopting RBA forecasts for the first year or two of the regulatory period, assuming an immediate return to 2.5% thereafter and then averaging forecast/assumed rates over some future horizon.[23]

However, in recognition that such an approach has produced unreasonable and unrealistic inflation forecasts for many years, including in the current low-inflation environment, nearly all Australian regulators have now made fundamental changes to their inflation forecasting approaches:

- In its June 2020 determination for SA Water, the Essential Services Commission of South Australia (ESCOSA) adopted a glidepath approach whereby it adopted the RBA's 1-year ahead and 2-year ahead forecasts of inflation for years 1 and 2 of the regulatory period, assumed that the rate of inflation would transition gradually to 2.5% thereafter by year 7 (i.e., a five-year glidepath) and remain at that level until year 10.[24]
- In every determination since June 2020, the Essential Services Commission in Victoria (ESC) has forecast inflation by applying 50% weight to RBA-based forecasts (similar to the QCA's current approach) and breakeven inflation.[25]
- In December 2020, the Australian Energy Regulator (AER) decided that it would adopt a glidepath approach to forecast inflation. Under its new approach, the AER adopts the RBA's 1-year ahead and 2-year ahead forecasts of inflation for years 1 and 2 of the regulatory period, and then assumes that inflation will transition gradually via a linear glidepath to 2.5% by year 5. The overall inflation forecast would then be calculated as the geometric average over the rates for years 1 to 5, matching the five-year regulatory period.[26]
- In February 2021, the Independent Competition and Regulatory Commission (ICRC) published a draft WACC methodology decision in which it proposed to adopt the AER's glidepath approach to forecasting inflation.[27]

It is in this context that the QCA has launched this standalone review of its inflation forecasting methodology.

Seqwater submits that the movement by a number of other regulators away from the approach that is currently used by the QCA reflects a growing realisation that the method that the QCA currently uses is unable to produce reasonable and reliable estimates of expected inflation for use in the Australian regulatory framework.

[23] The notable exception was the Economic Regulation Authority in Western Australia, who has consistently used breakeven inflation to forecast inflation.

[24] *ESCOSA, SA Water Regulatory Determination 2020, Final Determination: Statement of Reasons, June 2020.* Page 5.

[25] See, for example: *ESC, Melbourne Water Draft Decision, 17 March 2021.* Page 53.

[26] *AER, Regulatory treatment of inflation, December 2020.* Page 6.

[27] *ICRC, Review of methodologies for the Weighted Average Cost of Capital, February 2021.* Page 2.

5 Seqwater's responses to questions posed by the QCA

Question 1:

Over what term should we forecast the inflationary gain deduction we use to derive the 'return on capital' component of allowable revenues?

Seqwater submits that expected inflation should be estimated over the term of the regulatory period. The "take out what we expect to put back in" approach requires expected inflation to be estimated over the life of the regulatory period to be consistent with the NPV=0 principle, as explained in Section 3.4 of this submission.

Question 2:

Should we use the same expected inflation estimate (including the use of the same inflation forecasting term) for all purposes when modelling prices, or should we derive a different forecast inflation estimate for each purpose? Under what circumstances should we apply an input cost escalator that differs from our expected CPI inflation measure?

Seqwater submits that every parameter in the regulatory model should be estimated in a manner that is consistent with the role of that parameter in the model.

As documented in this submission, the role of the inflation parameter in the model for setting allowed returns and in the RAB roll-forward model is to "take out" inflation in one step and "put back" inflation in the other. To be consistent with the "take out what we expect to put back" framework, and consequently with the NPV=0 principle, it is necessary only that the inflation to be "taken out" is estimated on the same basis as the inflation that is to be "put pack." This requires that inflation is estimated over the same time period and with reference to the same inflation series in both steps where it is used. Thus, if national CPI is used in one place (e.g., when forecasting future inflation), it should also be used in the other.

Inflation is also used in other places within the QCA's regulatory framework. In these cases, the relevant inflation parameter should be estimated in a manner that is consistent with the role of that parameter in the regulatory model. For example, labour cost escalation rates are required when estimating efficient operating costs. If that parameter is designed to reflect labour cost inflation in a particular industry, or in a particular geographic location, estimates that best reflect that industry or location should be used.

Seqwater recognises that it is appropriate to temper this matching of the regulator's estimate with the role of the parameter with considerations of complexity and materiality. For example, in cases where a number of estimation approaches produce estimates that are not materially different, it may be appropriate to adopt the simpler and most easily available and transparent approach.

Question 3:

Should we maintain our existing approach to estimating expected inflation?

Seqwater submits that the QCA should not maintain its existing approach to expected inflation. As explained in Sections 3.4 and 3.5 of this submission, the implications of the "take out what you expect to out back in" framework, and of the NPV=0 principle, are that:

- The term of the inflation estimate should be set to the length of the regulatory period. Because what is added back in one step is observed inflation over the term of the regulatory period, what is deducted in the other step must be expected inflation over the same regulatory period; and
- What is required is the best possible forecast of actual inflation over the regulatory period. Because it is actual inflation that is added back in one step, it must be a forecast of actual inflation that is deducted in the other step.

Consequently, Seqwater submits that two changes should be made to the QCA's approach to estimating expected inflation:

- The term of the inflation estimate should be changed from the current 10-year period, and instead set to the length of the regulatory period; and
- Expected inflation should be estimated with reference to market data on the basis that this approach produces the best forecast of actual inflation.

Question 4:

If we continue to use short-term RBA forecasts in our forecasting methodology, should we consider using a multi-year transition path to our estimate of long-term inflation expectations? If so, what factors should we consider in our choice of transition path?

Seqwater submits that market data produces superior forecasts of future actual inflation and therefore should be preferred to RBA forecasts.

However, it may be the case that the QCA determines that a glide path approach is to be used, whereby RBA forecasts are adopted for Years 1 and 2, followed by a transition over some period to the 2.5% mid-point policy target. In this case, the QCA would have to determine the period over which to transition to 2.5%.

Seqwater submits that any glide path transition period should be informed by evidence. It should not be arbitrary or based on subjective judgement that is non-transparent and non-replicable by stakeholders. It should be transparent and its estimation should be replicable and clear to stakeholders.

For example, the length of the glide path transition period might be informed by market data. In cases where the evidence indicates that market participants do not expect inflation to return to 2.5% until 10 years into the future, the QCA might adopt an eight-year glide path transition from Years 2 to 10.

However, the use of an eight-year glide path transition to Year 10 does *not* imply that the QCA should adopt a 10-year averaging period when determining its inflation forecast. In the case of a glide path to Year 10, the QCA would have an estimate of inflation for each of the next 10 years, representing the QCA's best estimate of actual inflation in each of those years. In the case of a regulated business on a four-year regulatory cycle, the inflation forecast should be determined by taking the geometric average of the estimated rates for Years 1 to 4.

The length of the glide path transition might also be informed by historical evidence of the RBA's ability to move inflation back to 2.5%. For example, if there is evidence that, on average, it takes (say) seven years for inflation to move from its current level back to 2.5%, that could be used as the basis for the length of any glide path transition.

Seqwater considers that it would be problematic if the length of a glide path transition were inconsistent with the current market data and with the historical evidence of movements in observed inflation.

Question 5:

How should we derive medium- to long-term inflationary expectations, particularly over a shorter forecasting period where expected inflation may not reach the mid-point of the RBA's target range?

Consider the case where the QCA is simultaneously producing regulatory determinations for three business, with regulatory periods of three, four, and five years, respectively. In this case, the estimates of expected inflation (which is a market-wide parameter) should be the same for each year across all businesses. That is, all businesses would have the same estimate of inflation for Year 1. They would all have the same estimate of inflation for Year 2, and so on.

The first business will then have an inflation figure estimated as the geometric average over three years. The inflation figure for the second business would be estimated over four years, and so on.

This would result in different inflation forecasts being adopted for each of the three businesses. But that is precisely what is required. What the QCA expects to "put back in" differs across the three businesses, so what it must "take out" ought to also differ.

Finally, Seqwater notes (in the context of Question 4 above) that there is no need for any glide path to complete within the regulatory period. For example, suppose the QCA determines that RBA forecasts will be used for Years 1 and 2, followed by a glide to 2.5% in Year 10. This approach produces unique inflation estimates for each of the ten years. Expected inflation would be simply computed as the geometric mean over the relevant length of the regulatory period.

For the avoidance of doubt, in Seqwater's view, the most preferable way for the QCA to forecast inflation is using market data, such as inflation swaps. However, if the QCA determines that the inflation forecast should be determined using a glide path approach, then Seqwater considers that the glide path should be implemented in a way that is consistent with Seqwater's responses to Questions 4 and 5.

Question 6:

Should we consider the use of market-based measures of inflation expectations as either the primary estimation method or to derive long-term inflationary expectations?

As explained in Section 3.5 of this submission, an implication of the "take out what you expect to out back in" framework, and of the NPV=0 principle, is that we require the best possible forecast of actual inflation over the regulatory period. Because it is actual inflation that is added back in one step, it must be a forecast of actual inflation that is deducted in the other step.

Consequently, to the extent that market evidence provides superior forecasts of actual inflation, that is the approach that should be adopted.

As a second-best solution, the market evidence might be used to inform the length of a glide path transition period.

Seqwater cannot envisage any rationale for disregarding the market evidence entirely, given that this evidence comes from market participants who have real money at stake where outcomes depend exclusively on the very same inflation outcomes that the QCA is seeking to forecast.

Question 7:

If we continue to use RBA forecasts in our estimation methodology, are there certain circumstances where the RBA's trimmed mean forecast should be used?

Seqwater notes that the AER adopted trimmed mean forecasts in its 2019 decisions for SA Power Networks and the Energy Queensland distribution businesses. The AER adopted that approach because its standard approach at the time (which is the QCA's current approach) was producing implausible forecasts. The AER considered that it could not make fundamental changes to its approach without conducting a formal review process, so it turned to trimmed mean forecasts as a stop gap measure to reduce the regulatory inflation figure towards a somewhat more plausible figure. The AER has since fundamentally changed its approach to regulatory inflation.

Seqwater notes that our primary submission is to use market evidence as the basis for the regulatory inflation forecast, because that approach produces forecasts that are superior to those produced by the RBA.

However, if the QCA decides that it will continue to develop inflation forecasts using RBA forecasts then Seqwater considers it would be reasonable for the QCA to have the option of using trimmed mean forecasts in the limited circumstances of unusual and transient economic conditions that result in anomalous changes in headline inflation. Seqwater considers that the need for the use of trimmed mean forecasts should be assessed on a case-by-case basis (rather than being the default approach), through an open consultation process with stakeholders.

Question 8:

When using expected inflation measures for the different purposes in revenue and price modelling, are there local considerations that could make the Brisbane consumer price index (CPI) preferable to the national CPI?

Please refer to our response to Question 2 above.

6 Appendix: The debt allowance problem

In this appendix, we begin by setting out the nature of the debt allowance problem under the QCA's general approach to regulatory inflation. We then turn to the effect of the bespoke inflation true-up arrangement that applies specifically to Seqwater.

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 QCA's regulatory allowance does not match the efficient costs that the benchmark efficient network is contractually required to pay.

In particular, the QCA starts with its estimate of the prudent and efficient nominal cost of debt, but then:

- Deducts its estimate of expected inflation; and
- Adds back actual inflation via RAB indexation.

If the amount deducted differs from the amount that is added back (which is almost certain to be the case), the QCA's allowance will differ from the efficient cost that the regulated business is contractually required to pay.

The result of this mismatch is that:

- In some market conditions, the regulatory allowance is insufficient to cover the QCA'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 example in Figure 4 below shows that, if actual inflation turns out to be lower than the QCA's forecast, then equity investors will bear the shortfall (between the regulatory allowance and the nominal interest obligations faced by the regulated business) as a permanent under-recovery of efficient returns.

The example below assumes that:

- The regulated business faces nominal debt obligations that are exactly in line with the QCA's estimate of the nominal return on debt of 4.0% p.a.;
- The QCA estimates inflation to be 2.5% p.a. over the regulatory period; and
- Actual inflation turns out to be 1.5% p.a.

In this case, the regulated business would receive a cash return on debt allowance of 1.5% (i.e., 4.0% nominal allowance less 2.5% inflation forecast).

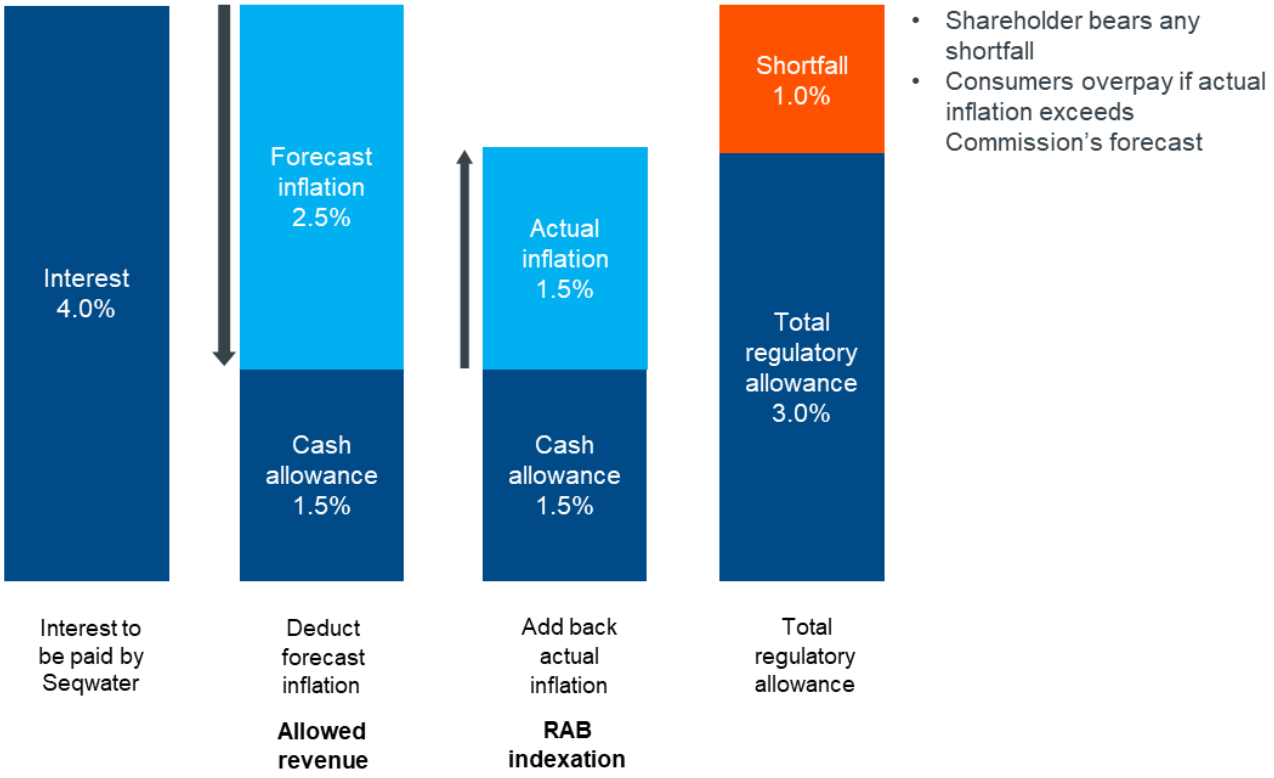
The QCA then indexes the RAB (including the debt portion of the RAB) at 1.5% p.a. This means that the total return on debt allowance received by the regulated business over the period would be 3.0% p.a. (i.e., 1.5% cash return on debt allowance plus 1.5% indexation on the debt portion of the RAB).

This results in a shortfall of 1.0% p.a. (i.e., 3.0% total regulatory allowance less 4.0% nominal interest expense faced by the regulated business). This shortfall is borne by the shareholders of the regulated business.

Symmetrically, if actual inflation turns out to be higher than the QCA's forecast, the total regulatory allowance would exceed the regulated business's nominal interest expense, and equity investors would enjoy a windfall gain. In such circumstances, consumers would pay regulated prices that exceed the efficient level.

Neither the regulated business nor consumers can manage or mitigate these losses in the regulatory period in which they arise.

Figure 4 Illustration of the debt allowance problem



Source: Seqwater.

In Seqwater's case, any gains or losses in previous regulatory periods arising from a mismatch between the QCA's estimate of expected inflation and actual inflation are 'trued-up' through an inflation adjustment to the Price Path Debt mechanism. The Price Path Debt is a mechanism that allows Seqwater to recoup the under-recovery of efficient allowed revenues in past regulatory periods (and, symmetrically, to return to consumers any past over-recoveries). The Price Path Debt is essential to maintaining Seqwater's financial viability and is established through Ministerial Referral Notices to the QCA.

A consequence of the debt allowance problem is that any consequential losses in one period are recovered from future consumers via the Price Path Debt. This means that if the debt allowance problem results in Seqwater under-recovering efficient revenues in the present regulatory period, then:

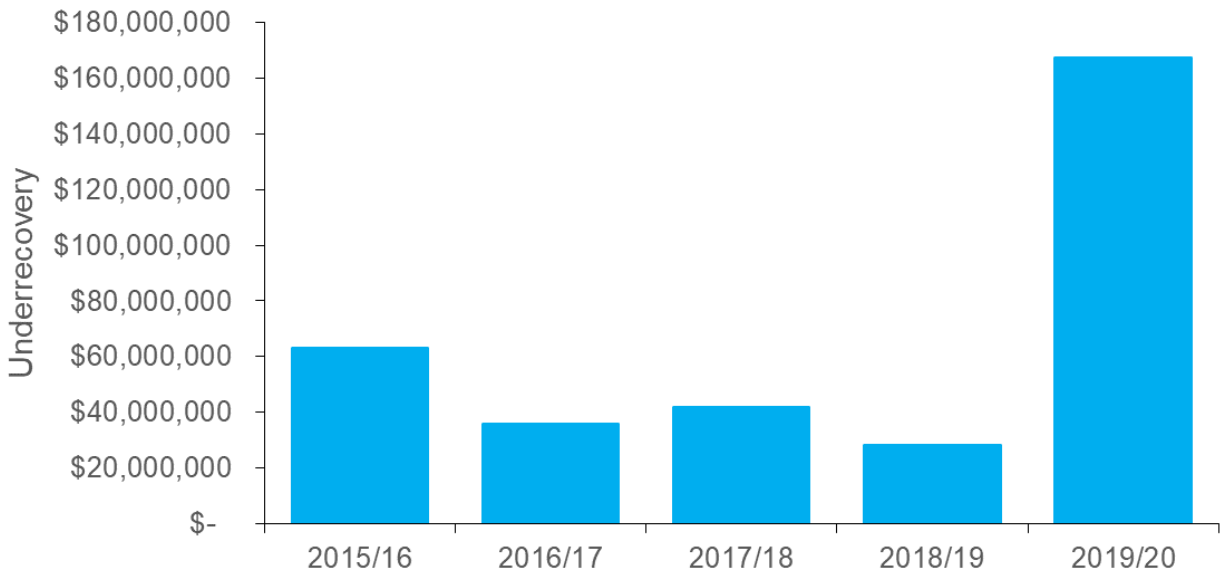
- Consumers in the current period would pay less than the efficient cost of delivering the regulated services; and
- Consumers in future regulatory periods would pay more than the efficient cost of delivering the regulated services as prices are set to recoup the maximum allowed revenues related to that period plus the increase in the Price Path Debt necessary to recover past losses arising from the debt allowance problem.

Symmetrically, any over-recovery of revenues in a given regulatory period as a result of the debt allowance problem would result in consumers in the current overpaying (relative to the efficient cost of service delivery) and future consumers underpaying (via the inflation adjustment to the Price Path Debt).

That is to say, the debt allowance problem results in allocative inefficiency and intergenerational inequity whenever actual inflation deviates from the QCA's estimate of expected inflation—as different generations of consumers either pay too much or too little relative to the efficient cost of service delivery, as a consequence of the way in which the regulatory allowance is set.

Figure 5 below presents the under-recovery of efficient revenues incurred by Seqwater since 2015-16 as a consequence of the mismatch between the QCA's estimate of expected inflation and actual inflation (measured using the Brisbane CPI), as reflected in Seqwater's Price Path Debt. The present value of under-recovered revenue since 2015-16 that needs to be recouped from future consumers is $362 million. This demonstrates the materiality of the debt allowance problem. In times of high inflation, the debt allowance problem could lead to similarly material over-recovery of efficient revenues by Seqwater.

Figure 5 Under-recovery of efficient revenues incurred by Seqwater since 2015-16 due to debt allowance problem



Source: Seqwater calculations using QCA pricing models and RBA data.

Seqwater submits that cycles of material under/over-recovery of efficient revenues, as a consequence of the debt allowance problem, are not in the long-term interests of consumers, and should be addressed through a change to the regulatory approach.

There are two straightforward ways of achieving the objective of setting the regulatory allowance to match the efficient cost of servicing debt:

- The QCA could set a nominal return on debt allowance such that the cash allowance in each regulatory year is sufficient to pay the contractually required nominal return on debt in each year. In this case, there would be no need to index the debt portion of the RAB for inflation. Thus, the indexation of the RAB would simply be multiplied by 0.4 to reflect the assumed portion of equity finance; or
- In relation to the return on debt, the QCA could adopt the same inflation figure throughout its regulatory approach. That is, indexation in relation to the debt portion of the RAB would be performed using the same

inflation figure as was used when reducing the allowed return on debt in the first step of the QCA's approach.[28]

Both of these approaches require only trivial changes to the regulatory models, and both result in the regulatory allowance matching the efficient cost of servicing debt.

[28] Under this approach, the true-up that is currently applied to Seqwater would be redundant in relation to the debt component of the RAB because the same inflation figure would be used in both steps of the QCA's approach.