Better Regulation

Rate of Return Guideline

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1   Overview

The AER's Better Regulation program involves the publication of several guidelines. Under the new rules, the rate of return guideline (the guideline) sets out the AER's approach to determining the allowed rate of return in accordance with the NEL and the NGL (collectively, the law and rules).

The new rules require the AER to set out in the guideline:[1]

- the methodologies the AER proposes to use

- the estimation methods, financial models, market data and other evidence the AER proposes to take into account.

The major elements the AER has proposed in this guideline include:

- Considering a broader range of material in arriving at a point estimate for the expected return on equity. The AER proposes to continue to use the Sharpe–Lintner CAPM for estimating a starting point and a range for the expected return on equity. However, the AER proposes to use the theory of the Black CAPM and dividend growth model outputs to inform the input parameters the AER uses to estimate the expected return on equity using the Sharpe–Lintner CAPM. The AER also proposes to have regard to other information, including the estimated return on equity from the Wright approach, valuation and broker reports, and other regulators. Where appropriate, this information may lead the AER to select an estimate of the expected return on equity that differs from the output of the Sharpe–Lintner CAPM.

- Changing from the current 'on the day' approach to a trailing average portfolio approach for estimating the return on debt. The trailing average will be calculated using a simple 10 year average and will be updated annually. The yearly average will be calculated over a period of 10 or more consecutive business days using yield estimates from an independent third party service provider for a 10 year debt term and the closest proximate for a BBB+ credit rating. There will be a 10 year transition period from the current 'on the day' approach to the trailing average portfolio approach.

- Considering a broader range of material to inform the estimation of the value of imputation credits.

1.1   Structure of the guideline

There are seven main parts to this guideline:

- Chapter two outlines the AER's application of criteria that the AER proposes to use to assess the merits of the various sources of information in setting the allowed rate of return.

- Chapter three outlines the AER's definition of the benchmark efficient entity and compensation for risk.

- Chapter four outlines the AER's approach to estimating the overall rate of return.

- Chapter five outlines the AER's approach to estimating the expected return on equity. This includes using the Sharpe–Lintner CAPM as the foundation model, and then having regard to other relevant material to arrive at a final point estimate of the expected return on equity.

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[1]   NER, cls. 6.5.2(n) and 6A.6.2(n); NGR, r. 87(14).

- Chapter six outlines the AER's approach to estimating the return on debt. This includes using a 10 year trailing average for estimating the return on debt, with annual updates. The transitional arrangements from the on the day approach to the trailing average approach are also outlined.

- Chapter seven outlines the AER's approach to estimating imputation credits.

1.2   Process for revision

The AER may amend or replace these guidelines from time to time in accordance with the consultation procedures under clauses 6.16 and 6A.20 of the NER and rule 9B of the NGR.[2]

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[2]   NER, cls. 6.2.8(e) and cl. 6A,2.3(e); NGR, r. 87(17).

2 Application of criteria

This chapter sets out the criteria that the AER proposes to use to assess the merits of the various sources of information in setting the allowed rate of return.

The AER considers decisions on the rate of return are more likely to be consistent with the allowed rate of return objective if they use estimation methods, financial models, market data and other evidence that are:

(1) where applicable, reflective of economic and finance principles and market information

    (a) estimation methods and financial models are consistent with well accepted economic and finance principles and informed by sound empirical analysis and robust data

(2) fit for purpose

    (a) use of estimation methods, financial models, market data and other evidence should be consistent with the original purpose for which it was compiled and have regard to the limitations of that purpose

    (b) promote simple over complex approaches where appropriate

(3) implemented in accordance with good practice

    (a) supported by robust, transparent and replicable analysis that is derived from available credible datasets

(4) where models of the return on equity and debt are used these are

    (a) based on quantitative modelling that is sufficiently robust as to not be unduly sensitive to errors in inputs estimation

    (b) based on quantitative modelling which avoids arbitrary filtering or adjustment of data, which does not have a sound rationale

(5) where market data and other information is used, this information is

    (a) credible and verifiable

    (b) comparable and timely

    (c) clearly sourced

(6) sufficiently flexible as to allow changing market conditions and new information to be reflected in regulatory outcomes, as appropriate.

3 Benchmark efficient entity and compensation for risk

This chapter sets out the AER's definition of the benchmark efficient entity. The definition of the benchmark efficient entity has implications for the estimated return on debt and equity (including the choice of data and models used to estimate the return on equity and debt).

3.1 Objective

The benchmark efficient entity is defined so that the allowed rate of return estimated for that benchmark efficient entity provides service providers with a reasonable opportunity to recover at least their efficient financing costs, consistent with the national electricity objective (NEO), national gas objective (NGO) and revenue pricing principles (RPP).[3]

3.2 Rule requirements

Clauses 6.5.2(c) and 6A.6.2(c) of the NER and rule 87(2)(3) of the NGR set out the allowed rate of return objective. The allowed rate of return objective requires the AER to set the rate of return for a distribution or transmission service provider, which is commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the distribution or transmission service provider in respect of the provision of regulated services.

3.3 Application

The AER's proposed conceptual definition of the benchmark efficient entity is a pure play, regulated energy network business operating within Australia.

In estimating the return on equity, the benchmark is applied to comparable entities which are then used to estimate the equity beta (see section 5.3.3). The equity beta, in turn enters the Sharpe–Lintner CAPM model, which is used as the foundation model for estimating the return on equity (see section 5.3.3).

In estimating the allowed return on debt, the definition of the benchmark efficient entity is applied to inform the choice of comparable entities which are used to estimate:

- the benchmark gearing ratio (see section 4.3.2)

- the benchmark credit rating (see section 6.3.3)

- the benchmark debt term (see section 6.3.3).

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[3]   NEL, ss. 7 and 7A; NGL, ss. 23 and 24.

4 Overall rate of return

This chapter sets out the AER's proposed approach to estimating the overall rate of return for service providers.

4.1 Objective

The overall rate of return is to be set such that it achieves the allowed rate of return objective. This requires that the AER set a rate of return which reflects the efficient financing costs of a benchmark efficient entity. The benchmark efficient entity is to be subject to a similar degree of risk in providing regulated services as the service provider which is subject to the determination.

Together with the other building block components, the estimate of the overall rate of return is to be set such that:

- it promotes efficient investment in, and efficient operation and use of, electricity and natural gas services for the long term interests of consumers[4]

- a regulated network service provider should be provided with a reasonable opportunity to recover at least the efficient costs the operator incurs in providing regulated services and complying with its regulatory obligations.[5]

4.2 Rule requirements

Clauses 6.5.2(d) and 6A.6.2(d) of the NER and rule 87(4) of the NGR specify two elements which the AER is to apply in estimating the allowed rate of return.

The first element, provided by clauses 6.5.2(d)(1), and 6A.6.2(d)(1) of the NER and rule 87(4)(a) of the NGR, requires that the AER apply a weighted average of:

- the return on equity for the regulatory control period in which that regulatory year occurs

- the return on debt for that regulatory year.

The second element provides that the AER must use a nominal vanilla basis to calculate the allowed rate of return, and that this is consistent with the estimate of value of imputation credits.[6] In arriving at the allowed rate of return, the rules require that the AER has regard to:[7]

- relevant estimation methods, financial models, market data and other evidence;

- the desirability of using an approach that leads to the consistent application of any estimates of financial parameters that are relevant to the estimates of, and that are common to, the return on equity and the return on debt; and

- any interrelationships between estimates of financial parameters that are relevant to the estimates of the return on equity and the return on debt.

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[4]   NEL, s. 7; NGL, s. 23.
[5]   NEL, s. 7A; NGL, s. 24.
[6]   NER, cls. 6.5.2(d)(2) and 6A.6.2(d)(2); NGR, r. 87(4)(b).
[7]   NER, cls. 6.5.2(e) and 6A.6.2(e); NGR, r. 87(5).

4.3 Application

This section describes how the overall rate of return is proposed to be estimated. This involves the following:

- applying a nominal post–tax model

- calculating the weighted average cost of capital (WACC) using a vanilla WACC formula

- applying intra–period adjustments of the WACC

4.3.1 Applying a nominal post–tax model

The AER proposes to continue to apply a post–tax revenue model (PTRM) to fulfil the rule requirements to apply a nominal post–tax framework.[8]

The PTRM accommodates the use of a nominal vanilla WACC for calculating the rate of return.[9] The treatment of tax enters the PTRM via the cash flows. It is therefore consistent with the use of a nominal vanilla WACC for calculating the rate of return and consistently incorporates the estimate of the value of imputation credits.

4.3.2 Calculating the weighted average cost of capital using a vanilla WACC formula

The AER proposes to calculate the WACC by applying the following vanilla WACC formula:

$$WACC_{vanilla} = E(k_e)\frac{E}{V} + E(k_d)\frac{D}{V}$$

where:

- $E(k_e)$ is the expected required return on equity

- $E(k_d)$ is the expected required return on debt

- $\frac{E}{V}$ is the proportion of equity in total financing (comprising equity and debt).

- $\frac{D}{V}$ is the proportion of debt in total financing, and is equal to the AER's proposed benchmark efficient entity gearing ratio of 0.6.

4.3.3 Intra–period adjustment of the WACC

The AER proposes to update the overall rate of return annually. This is a result of the allowed return on debt being updated annually.

The AER proposes to set the expected return on equity for the duration of the regulatory control period.

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[8]   NER, cls. 6.4.2, 6.4.3, 6A.5.3, and 6A.5.4; NGR rr. 76 and 87A.
[9]   NER, cls. 6.5.2(d)(2) and 6A.6.2(d)(2); NGR, r. 87(4)(b).

4.3.4 Arriving at point estimates or ranges

The overall rate of return is a point estimate, reflecting the use of a point estimate for the allowed return on debt and the expected return on equity.

5 Return on equity

This chapter sets out the AER's proposed approach to estimating the expected return on equity. The AER proposes a six step approach to determine an estimate of the expected return on equity that contributes to an overall rate of return that achieves the allowed rate of return objective. These steps are explained below, and are summarised in figure 5.1.

5.1 Objective

The expected return on equity must be estimated such that it contributes to the achievement of the allowed rate of return objective. It should therefore provide compensation to a service provider for the equity financing cost which is commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk.

5.2 Rule requirements

Clauses 6.5.2(f), 6.5.2(g), 6A.6.2(f) and 6A.6.2(g) of the NER, and rules 87(6) and 87(7) of the NGR specify that:

- the return on equity for a regulatory control period must be estimated such that it contributes to the achievement of the allowed rate of return objective

- in estimating the return on equity, regard must be had to the prevailing conditions in the market for equity funds.

The allowed rate of return objective is that:[10]

- the rate of return for a 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 service provider.

In developing a guideline that estimates the expected return on equity in accordance with the allowed rate of return objective, the AER has had regard to, among other things, relevant estimation methods, financial models, market data and other evidence.[11]
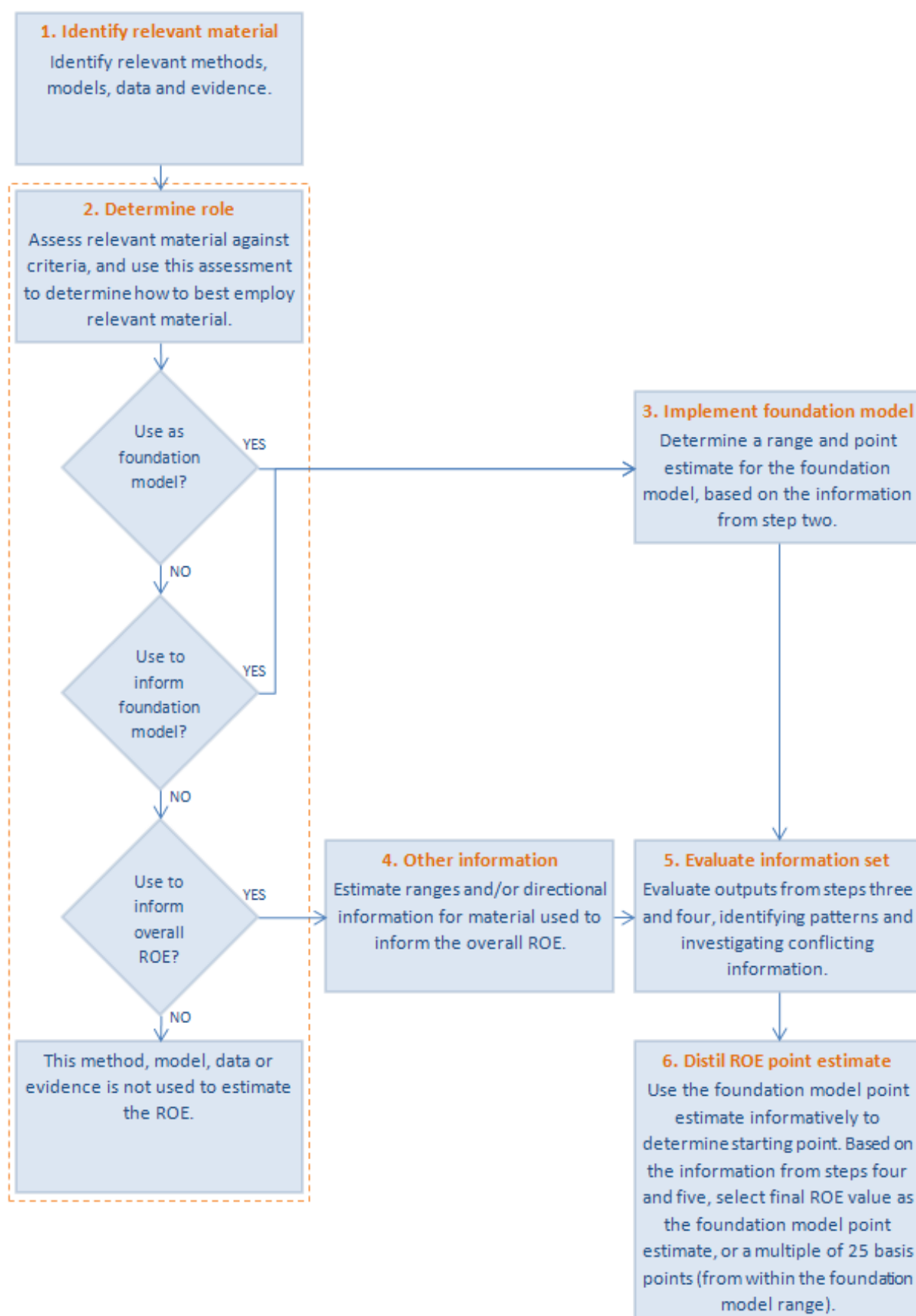
5.3 Application

The AER proposes to estimate the expected return on equity using the approach summarised in figure 5.1.

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[10] NER, cls. 6.5.2(c) and 6A.6.2(c); NGR, r. 87(3).
[11] NER, cls. 6.5.2(e)(1) and 6A.6.2(e)(1); NGR, r. 87(5)(a).

Figure 5.1   Flowchart of the AER's proposed approach to estimating the expected return on equity

1. Identify relevant material
Identify relevant methods, models, data and evidence.

2. Determine role
Assess relevant material against criteria, and use this assessment to determine how to best employ relevant material.

Use as foundation model? — YES →

3. Implement foundation model
Determine a range and point estimate for the foundation model, based on the information from step two.

Use to inform foundation model? — YES →

Use to inform overall ROE? — YES →

4. Other information
Estimate ranges and/or directional information for material used to inform the overall ROE.

5. Evaluate information set
Evaluate outputs from steps three and four, identifying patterns and investigating conflicting information.

NO → This method, model, data or evidence is not used to estimate the ROE.

6. Distil ROE point estimate
Use the foundation model point estimate informatively to determine starting point. Based on the information from steps four and five, select final ROE value as the foundation model point estimate, or a multiple of 25 basis points (from within the foundation model range).

Source: AER analysis.

5.3.1 Step one: identify relevant material

The AER's first step proposes to identify the relevant material that may inform the estimate of the expected return on equity. The material identified by the AER as relevant is outlined in the explanatory statement to this guideline, and in table 5.1 and table 5.2 of this guideline.

5.3.2 Step two: determine role

The AER's second step proposes to assess the relevant material identified in step one against the AER's assessment criteria. The purpose of this assessment is to identify what role the AER proposes relevant material to play in estimating the expected return on equity. The AER proposes to use each piece of relevant material only once (to the extent practicable), in one of four ways:

(1) As the foundation model.

(2) To inform the estimation of parameters within the foundation model.

(3) To inform where within the return on equity range (set by the foundation model) the final point estimate of the expected return on equity should fall.

(4) Not used to estimate the expected return on equity.

The AER undertook an assessment of the relevant material identified in step one against the assessment criteria. The AER assessed models and other relevant material. The detailed assessment is outlined in the explanatory statement to this guideline.

The outcome of the AER's model assessment is outlined in table 5.1.

Table 5.1   Role of relevant models

Material (step one)	Role (step two)
Sharpe–Lintner CAPM	Foundation model
Black CAPM	Inform foundation model parameter estimates (equity beta)
Dividend growth models	Inform foundation model parameter estimates (market risk premium)
Fama–French three factor model	No role

Source: AER analysis.

The outcome of the AER's assessment of other relevant information is outlined in table 5.2.

Table 5.2   Role of other information

Material (step one)	Role (step two)
Commonwealth government securities	Inform foundation model parameter estimates (risk free rate)
Observed equity beta estimates	Inform foundation model parameter estimates (equity beta)
Historical excess returns	Inform foundation model parameter estimates (MRP)
Survey evidence of the MRP	Inform foundation model parameter estimates (MRP)
Implied volatility	Inform foundation model parameter estimates (MRP)
Other regulators' MRP estimates	Inform foundation model parameter estimates (MRP)
Debt spreads	Inform foundation model parameter estimates (MRP)
Dividend yields	Inform foundation model parameter estimates (MRP)
Wright approach	Inform the overall return on equity
Takeover and valuation reports	Inform the overall return on equity
Brokers' return on equity estimates	Inform the overall return on equity
Other regulators' return on equity estimates	Inform the overall return on equity
Comparison with return on debt	Inform the overall return on equity
Trading multiples	No role
Asset sales	No role
Brokers' WACC estimates	No role
Other regulators' WACC estimates	No role
Finance metrics	No role[12]

Source: AER analysis.

5.3.3   Step three: implement foundation model

The AER's third step proposes to use the Sharpe–Lintner CAPM as the foundation model. The AER proposes to implement the Sharpe–Lintner CAPM as follows:

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[12]   Finance metrics may play a role in future AER decisions. However, at this stage the AER has not formed a view on how these tests should be applied. Therefore, these tests are not included in this final guideline.

- The Sharpe–Lintner CAPM is estimated by adding to the risk free rate the product of the equity beta and market risk premium (MRP).

- The range and point estimate for the expected return on equity is calculated based on the range and point estimates from the corresponding input parameters. For example, the lower bound of the expected return on equity range is calculated by applying the point estimate for the risk free rate and the lower bound estimates of the equity beta and MRP. A probability will not be assigned to values within the range, but it will not be assumed that all values within the range are equally probable.

The AER proposes to estimate the input parameters for the Sharpe–Lintner CAPM as follows:

Risk free rate

The AER proposes to adopt a forward looking risk free rate that is commensurate with prevailing conditions in the market for funds at the commencement of the regulatory control period.

On the risk free rate proxy, the AER proposes to adopt:

- the yield on CGS

- a 10 year term.

On the risk free rate averaging period, the AER proposes to adopt a period that:

- is short—specifically, 20 consecutive business days in length

- is as close as practicably possible to the commencement of the regulatory control period.

Equity beta

The AER proposes to estimate a range for the equity beta, and then select a point estimate for the equity beta from within that range.

The AER proposes to adopt the same point estimate and range for equity beta across each of the energy sectors the AER regulates (electricity transmission, electricity distribution, gas transmission and gas distribution).

Under the AER's approach, the AER proposes to estimate the range for the equity beta based on empirical analysis using a set of Australian energy utility firms the AER considers reasonably comparable to the benchmark efficient entity. This approach leads to a range for equity beta from 0.4 to 0.7.

The AER then proposes to use other information sources to inform the selection of a point estimate from within the empirical range of equity beta estimates. This additional information includes:

- empirical estimates of overseas energy networks.

- the theoretical principles underpinning the Black CAPM.

This approach leads to a point estimate of 0.7 for equity beta, chosen from within the range 0.4 to 0.7.

Market risk premium

The AER proposes to estimate a range for the MRP, and then select a point estimate from within that range.

The AER proposes to estimate the range for the MRP with regard to theoretical and empirical evidence—including historical excess returns, dividend growth model estimates, survey evidence and conditioning variables. The AER will also have regard to recent decisions among Australian regulators. Each of these sources of evidence has strengths and limitations.

The AER proposes to estimate the point estimate for the MRP based on the AER's regulatory judgement, taking into account estimates from each of those sources of evidence and considering their strengths and limitations.

5.3.4   Step four: other information

The AER's fourth step proposes to estimate ranges, directional or relative information that will inform the point estimate of the expected return on equity.

The AER proposes to determine the manner in which each piece of other information is used by assessing the information against the assessment criteria. This assessment is outlined in the explanatory statement to this guideline.

The outcome of the AER's assessment on the form of additional information is outlined in table 5.3.

Table 5.3   Form of other relevant information

Additional information	Form of information
Wright approach	Point in time
Other regulators' return on equity estimates	Point in time
Brokers' return on equity estimates	Point in time and directional
Takeover/valuation reports	Directional
Comparison with return on debt	Relative

Source: AER analysis.

5.3.5   Step five: evaluate information set

The AER's fifth step proposes to evaluate the full set of material that will inform, in some way, the estimation of the expected return on equity. This includes assessing the foundation model range and point estimate alongside the other information from step four.

In undertaking this evaluation the AER may have regard to matters including:

- patterns shown in the other information

- the strengths and limitations of the other information

- the magnitude by which the other information suggests that the foundation model point estimate under or over estimates the expected return on equity (if at all).

5.3.6   Step six: distil point estimate of the expected return on equity

The AER's sixth step proposes to determine the final point estimate for the expected return on equity. The AER's proposes to use the foundation model point estimate as the starting point for estimating the expected return on equity.

The final point estimate of the expected return on equity will require the exercise of regulatory judgement. The AER proposes to draw on the analysis and evaluation of the other information undertaken in step five in exercising this judgement. For example, if the evaluation of other information suggests that the point estimate from the foundation model contributes to an estimate of the rate of return that achieves the allowed rate of return objective, then this point estimate (rounded) will be applied. Alternatively, if the evaluation suggests that the point estimate is too high or low, the point estimate will be changed by an amount informed by the other information (using the AER's regulatory judgment).

The AER proposes the final point estimate of the expected return on equity to be the foundation model point estimate, or alternatively, a different value that is a multiple of 25 basis points. If the foundation model point estimate is applied, the AER proposes to round this estimate to a single decimal point. This recognises the limited precision with which the expected return on equity can be estimated.

The approach outlined is premised on the expectation that the analysis in step five should not suggest a final estimate of the expected return on equity outside the foundation model range. If this expectation is not met, the AER may reconsider the foundation model input parameter estimates, or more fundamentally, the foundation model itself. This recognises that, ultimately, the AER's rate of return must meet the allowed rate of return objective.

6 Return on debt

This chapter sets out the AER's proposed approach to estimating the allowed return on debt for service providers.

6.1 Objective

The allowed return on debt must be estimated such that it contributes to the achievement of the allowed rate of return objective. It should therefore provide compensation to a service provider for the debt financing cost which is commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk.

6.2 Rule requirements

The rules set out the:[13]

- calculation of the return on capital

- allowed rate of return objective (including factors the AER must have regard to in setting the rate of return)

In addition, the return on debt may be estimated by the AER using a methodology which results in either:

- the return on debt for each regulatory year in the regulatory control period being the same; or

- the return on debt (and consequently the allowed rate of return) being or potentially being, different for different regulatory years in the regulatory control period.

In estimating the return on debt the AER must have regard to the following factors:

- the desirability of minimising any difference between the return on debt and the return on debt of a benchmark efficient entity

- the interrelationship between the return on equity and the return on debt

- the incentive that the return on debt may provide in relation to capital expenditure over the regulatory control period, including as to the timing of capital expenditure

- any impacts (including in relation to the costs of servicing debt across regulatory control periods) on a benchmark efficient entity referred to in the allowed rate of return objective that could arise as a result of changing the methodology that is used to estimate the return on debt from one regulatory control period to the next.

6.3 Application

This section sets out the method the AER proposes to use to calculate the allowed return on debt.

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[13]   NER, cls. 6.5.2 and 6A.6.2; NGR, r. 87.

6.3.1 Trailing average portfolio approach

The AER proposes to estimate the allowed return on debt using a trailing average portfolio approach following the completion of a transitional arrangement period. In particular, the AER proposes to apply the following:

- a trailing average portfolio approach with the length of the trailing average to be 10 years

- equal weights to be applied to all the elements of the trailing average

- the trailing average to be automatically updated every regulatory year within the regulatory control period.

In particular, the AER proposes to determine the allowed return on debt for each regulatory year within a regulatory control period in accordance with the following formula:

$$_xkd_{x+1} = \frac{1}{10} \cdot \sum_{t=1}^{10} {}_{x-10+t}R_{x+t}$$

where:

- $_xkd_{x+1}$ refers to the allowed return on debt for regulatory year *x+1*

- $_{x-10+t}R_{x+t}$ refers to the estimated rate of return on debt that was entered into in year *(x-10+t)* and matures in year *(x+t)* (in the formula above all debt has a ten year term); and

- weights of 1/10 apply to each element of the trailing average.

Estimates of $_{x-10+t}R_{x+t}$ represent simple averages of the estimates for each business day within the averaging period in year *(x-10+t)*. The AER proposes to obtain each daily estimate within the averaging period from an independent third party data provider in accordance with the estimation procedure specified in this guideline (section 6.3.3).

6.3.2 Transitional arrangements

The AER proposes to implement a trailing average portfolio approach after a period of transition for all regulated businesses. The AER proposes to apply a transitional arrangement to determine the allowed nominal return on debt (k_d) at the commencement of a service provider's forthcoming regulatory control period. The AER proposes the period of transition of 10 regulatory years. The proposed transition method is set out below.

In the transitional formulae:

- $_aR_{a+10}$ corresponds to the estimated return on debt that was entered into in year *a* and matures in year *a+10;* and

- $_bkd_{b+1}$ refers to the allowed return on debt for regulatory year *b+1*. The AER proposes to compute the estimates of $_aR_{a+10}$ in accordance with the specified estimation method and represent simple averages of the estimates for each business day within the corresponding averaging period.

In the first regulatory year of the transitional period, the AER proposes the allowed rate of return on debt to be based on the estimated prevailing rate of return on debt for that year (similar to the 'on the day' approach):

$$_0kd_1 = {}_0R_{10}$$

In the second regulatory year, the AER proposes the allowed rate of return on debt to be the weighted average of the prevailing rates in the first and second regulatory year of the transitional period:

$$_1kd_2 = 0.9 \cdot {}_0R_{10} + 0.1 \cdot {}_1R_{11}$$

The AER proposes the allowed rate of return on debt in the third regulatory year to be the weighted average of the prevailing rates in the first, second, and third regulatory year of the transitional period:

$$_2kd_3 = 0.8 \cdot {}_0R_{10} + 0.1 \cdot {}_1R_{11} + 0.1 \cdot {}_2R_{12}$$

The calculation for all subsequent regulatory years until the transitional period is completed is set out below:

$$_3kd_4 = 0.7 \cdot {}_0R_{10} + 0.1 \cdot {}_1R_{11} + 0.1 \cdot {}_2R_{12} + 0.1 \cdot {}_3R_{13}$$

$$_4kd_5 = 0.6 \cdot {}_0R_{10} + 0.1 \cdot {}_1R_{11} + 0.1 \cdot {}_2R_{12} + 0.1 \cdot {}_3R_{13} + 0.1 \cdot {}_4R_{14}$$

$$_5kd_6 = 0.5 \cdot {}_0R_{10} + 0.1 \cdot {}_1R_{11} + 0.1 \cdot {}_2R_{12} + 0.1 \cdot {}_3R_{13} + 0.1 \cdot {}_4R_{14} + 0.1 \cdot {}_5R_{15}$$

$$_6kd_7 = 0.4 \cdot {}_0R_{10} + 0.1 \cdot {}_1R_{11} + 0.1 \cdot {}_2R_{12} + 0.1 \cdot {}_3R_{13} + 0.1 \cdot {}_4R_{14} + 0.1 \cdot {}_5R_{15} + 0.1 \cdot {}_6R_{16}$$

$$_7kd_8 = 0.3 \cdot {}_0R_{10} + 0.1 \cdot {}_1R_{11} + 0.1 \cdot {}_2R_{12} + 0.1 \cdot {}_3R_{13} + 0.1 \cdot {}_4R_{14} + 0.1 \cdot {}_5R_{15} + 0.1 \cdot {}_6R_{16} + 0.1 \cdot {}_7R_{17}$$

$$_8kd_9 = 0.2 \cdot {}_0R_{10} + 0.1 \cdot {}_1R_{11} + 0.1 \cdot {}_2R_{12} + 0.1 \cdot {}_3R_{13} + 0.1 \cdot {}_4R_{14} + 0.1 \cdot {}_5R_{15} + 0.1 \cdot {}_6R_{16} + 0.1 \cdot {}_7R_{17} + 0.1 \cdot {}_8R_{18}$$

$$_9kd_{10} = 0.1 \cdot {}_0R_{10} + 0.1 \cdot {}_1R_{11} + 0.1 \cdot {}_2R_{12} + 0.1 \cdot {}_3R_{13} + 0.1 \cdot {}_4R_{14} + 0.1 \cdot {}_5R_{15} + 0.1 \cdot {}_6R_{16} + 0.1 \cdot {}_7R_{17} + 0.1 \cdot {}_8R_{18} + 0.1 \cdot {}_9R_{19}$$

6.3.3 Estimation procedure

The AER proposes to apply the following estimation procedure for estimating the prevailing return on debt for each service provider during the averaging period:

- Using the published yields from an independent third party data service provider.

- Using a credit rating of BBB+ from Standard and Poor's or the equivalent rating from other recognised rating agencies. If the published yields do not reflect the assumed credit rating of BBB+ or the equivalent from rating agencies, the AER will apply the published yields that are the closest approximation of the BBB+ credit rating.

- Using a term to maturity of debt of 10 years. Where the yield at a term to maturity of 10 years is not published by the third party service provider, the AER proposes to determine the method for extrapolation at each network service provider's determination. The AER may estimate an extrapolation of the total debt yield or separately estimate the risk free rate and debt risk premium components (if extrapolation is required). Irrespective of which method is used the AER proposes that the risk free rate component of debt yield at a minimum should be applied at the annual update. The AER proposes to calculate the risk free rate component by adding the difference between the average annualised yields for Commonwealth Government Securities with a 10 year and the shorter term maturity. The averaging period that is proposed to apply is described in the next section.

- If the published yields from an independent third party data service provider are quoted on a semi-annual basis, then the AER proposes to annualise the yields by applying the following formula:

$$y_a = \left(1 + \frac{y_s}{2}\right)^2 - 1$$

where:

- y_a is the annualised yield

- y_s is the semi-annual yield published by an independent third party data service provider.

The AER proposes to specify in a service provider's determination how an automatic update of the trailing average would be applied in circumstances where estimation procedure for calculating the allowed return on debt is no longer available or has been amended during a service provider's regulatory control period.

Averaging period

For each regulatory year in the regulatory control period, the AER proposes to estimate the prevailing rate of return on debt as a simple average of the prevailing rates observed over a period of 10 or more consecutive business days up to a maximum of 12 months. Such an averaging period should satisfy the following conditions:

- it should be specified prior to the commencement of the regulatory control period

- at the time it is nominated, all dates in the averaging period must take place in the future

- it should be as close as practical to the commencement of each regulatory year in a regulatory control period

- an averaging period needs to be specified for each regulatory year within a regulatory control period

- the proposed averaging periods for different regulatory years are not required to be identical but should not overlap

- the nominal return on debt is to be updated annually using the agreed averaging period for the relevant regulatory year

- each agreed averaging period is to be confidential.

The averaging periods can be determined as follows:

- proposed by the service provider in the Framework and Approach process or in its initial regulatory proposal, and agreed by the AER; or

- if the AER does not agree to the averaging periods proposed by a service provider, the averaging period would be determined by the AER, and notified to the service provider within a reasonable time prior to the commencement of the regulatory control period.

7 Imputation credits

This section sets out the AER's approach to estimating the value of imputation credits. This primarily serves as an adjustment made to the cost of company income tax building block allowance.

7.1 Objective

The objective of the adjustment for the value of imputation credits is to reduce the cost of corporate income tax such that only the proportion of company tax which is actually retained by government is reflected in the corporate income tax building block. That is, the adjustment is an estimate of the company tax paid which the government subsequently transfers to investors.

7.2 Rule requirements

Clauses 6.5.3 and 6A.6.4 of the NER and rule 87A of the NGR set out the cost of corporate income tax rule. This includes an adjustment for the value of imputation credits as follows:

> The estimated cost of corporate income tax of a Distribution Network Service Provider for each regulatory year (ETC_t) must be calculated in accordance with the following formula:
>
> $ETC_t = (ETI_t \times r_t)(1 - \gamma)$
>
> Where:
>
> ETI_t is an estimate of the taxable income for that regulatory year that would be earned by a benchmark efficient entity as a result of the provision of standard control services if such an entity, rather than the Distribution Network Service Provider, operated the business of the Distribution Network Service Provider, such estimate being determined in accordance with the post-tax revenue model.
>
> r_t is the expected statutory income tax rate for that regulatory year as determined by the AER; and
>
> γ is the value of imputation credits

7.3 Application

This section sets out the method to be applied by a service provider to estimate the value of imputation credits.

Overall, the value of imputation credits would be estimated as a market wide parameter. Specifically, it would be determined as the product of:

- a payout ratio
- a utilisation rate.

The AER considers this approach leads to an estimate of 0.5 for the value of imputation credits, based on a payout ratio of 0.7 and a utilisation rate of 0.7.

7.3.1 Payout ratio

The payout ratio would be estimated using the cumulative payout ratio approach. This approach uses ATO tax statistics to calculate the proportion of imputation credits generated (via tax payments) that have been distributed by companies since the start of the imputation system. This approach leads to an estimate of 0.7 for the payout ratio.

7.3.2 Utilisation rate

The utilisation rate would be estimated using the body of relevant evidence with regards to its strengths and limitations, checked against a range of supporting evidence. The body of evidence includes:

- the equity ownership approach

- tax statistic estimates

- implied market value studies

- the conceptual goalposts approach.

In particular, the AER has higher regard to those approaches that:

- accord with the AER's interpretation of the nature of the utilisation rate parameter in the conceptual framework provided by Officer and Monkhouse (while acknowledging that interpretation of this framework is a matter of debate)

- are simpler and more transparent

- produce reasonable estimates in light of empirical realities and conceptual considerations; namely, that most (but not all) investors are eligible to redeem imputation credits, and that eligible investors in the possession of imputation credits have the incentive to redeem them.

This approach leads to an estimate of 0.7 for the utilisation rate, based on the AER giving:

- more regard to the equity ownership approach, which suggests an estimate of 0.7 to 0.8

- regard to tax statistic estimates, which suggest an estimate of 0.4 to 0.8

- less regard to implied market value studies, which suggest an estimate of 0 to 0.5

- less regard to the conceptual goalposts approach, which suggests an estimate of 0.8 to 1.0.

A   Glossary

This guideline uses following definitions and acronyms.

Term	Definition
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
determination	In this document generally, in the context of the rate of return, the term "determination" refers both to regulatory determinations under the NER and access arrangement determinations under the NGR.
MRP	Market risk premium
NEL	National Electricity Law
NER	National Electricity Rules
new rules	The National Electricity Rules and National Gas Rules that were published by the AEMC on 29 November 2012
NGL	National Gas Law
NGR	National Gas Rules
QTC	Queensland Treasury Corporation
RAB	Regulatory Asset Base
regulatory control period	In this document generally, in the context of the rate of return, the term 'regulatory control period' refers both to regulatory control period under the NER and access arrangement period under the NGR
service providers	Electricity transmission network service provider, electricity distribution network service providers and gas service providers
the guideline	Rate of return guideline
WACC	Weighted average cost of capital
2009 WACC review	AER 2009 review of the weighted average cost of capital (WACC) parameters (published in May 2009).

B Estimation of the return on debt: an example

The purpose of this appendix is to illustrate how the AER proposes to estimate the return on debt under the trailing average portfolio approach and how the AER proposes to implement the transition.

For the example provided below the AER simulated monthly yield data using the model suggested in appendix A of the QTC's submission to the consultation paper.[14] The AER emphasises that the model was chosen purely for illustrative purposes. The AER makes no comments on how accurately it describes the short-term movements in the return on debt in Australia under the current market conditions.

The simulation model specified by the QTC is as follows:

$$S_t = S_{t-1} + \alpha T(\theta - S_{t-1}) + \sigma\sqrt{T}\varepsilon_t$$

where:[15]

- S_t is the randomly generated interest rate at time t

- S_{t-1} is the randomly generated interest rate at time t-1

- T is the time increment in years (T=1/12 to produce monthly observations)

- α is the parameter characterising annual mean reversion speed (α=0.2)

- θ is the long-term average interest rate (θ=7.0 per cent)

- σ is the annualised yield volatility parameter (σ=12.0 per cent)

- ε_t are the independent identically distributed random variables, distributed normally with zero mean and standard deviation of one.

The AER chose the starting rate of return to be equal to the average of Bloomberg seven year BBB yields, extrapolated out to ten years using the paired bonds approach for the period from 28 October 2013 to 22 November 2013. The AER generated 300 monthly observations. For the purposes of this example, the AER assumed a service provider had a five year regulatory control period, and the next regulatory control period would start on 1 January 2016. The AER also assumed that the averaging periods for each regulatory year were set to the month of November of the previous year.

Figure B.1 illustrates the allowed return on debt during the transitional period of January 2016 to December 2025. Following the transitional period, the allowed return on debt is estimated according to the trailing average portfolio approach (red solid line). Note that the allowed return on debt in the first regulatory year of the transitional period is equal to the 'on the day' allowance for the same regulatory year.

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[14] Queensland Treasury Corporation (QTC), *Submission to AER's rate of return guidelines consultation paper*, 21 June 2013, pp. 29–30.
[15] Due to the scarcity of relevant data for ten year debt and since the example is provided purely for illustrative purposes, we used the same parameter values as those provided by the QTC.

Figure B.1   **An example of estimated allowed rate of return on debt during a transitional period and under the trailing average portfolio approach**

—— Annualised monthly yields (simulated)   —— Return on debt: transition and trailing average portfolio approach
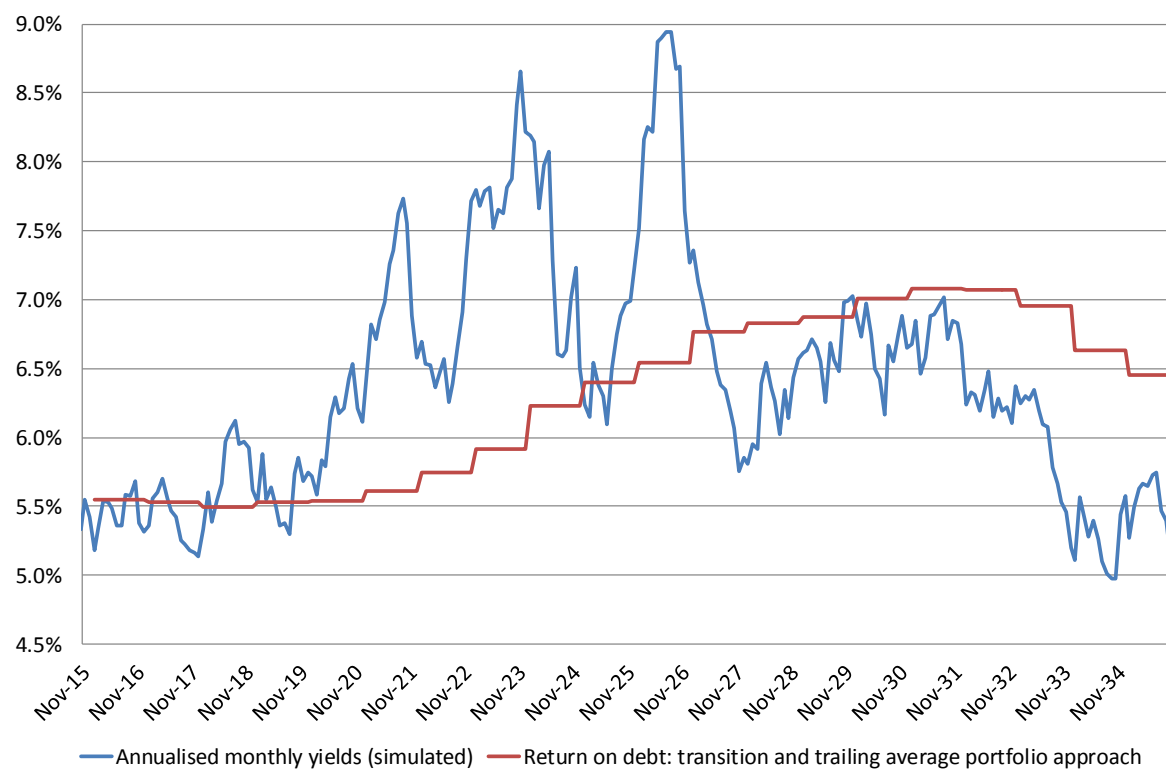
Source: AER analysis.

Table B.1 provides details of the estimation of the allowed return on debt for the first 11 regulatory years.

Table B.1   Example of the estimated return on debt allowance calculations (per cent)

Regulatory year	Prevailing rate during the averaging period	Computations	Allowed return on debt
2016	5.55	5.55	5.55
2017	5.38	$0.9 \cdot 5.55 + 0.1 \cdot 5.38$	5.53
2018	5.16	$0.8 \cdot 5.55 + 0.1 \cdot 5.38 + 0.1 \cdot 5.16$	5.49
2019	5.92	$0.7 \cdot 5.55 + 0.1 \cdot 5.38 + 0.1 \cdot 5.16 + 0.1 \cdot 5.92$	5.53
2020	5.68	$0.6 \cdot 5.55 + 0.1 \cdot 5.38 + 0.1 \cdot 5.16 + 0.1 \cdot 5.92 + 0.1 \cdot 5.68$	5.54
2021	6.21	$0.5 \cdot 5.55 + 0.1 \cdot 5.38 + 0.1 \cdot 5.16 + 0.1 \cdot 5.92 + 0.1 \cdot 5.68 + 0.1 \cdot 6.21$	5.61
2022	6.88	$0.4 \cdot 5.55 + 0.1 \cdot 5.38 + 0.1 \cdot 5.16 + 0.1 \cdot 5.92 + 0.1 \cdot 5.68 + 0.1 \cdot 6.21 + 0.1 \cdot 6.88$	5.74
2023	7.29	$0.3 \cdot 5.55 + 0.1 \cdot 5.38 + 0.1 \cdot 5.16 + 0.1 \cdot 5.92 + 0.1 \cdot 5.68 + 0.1 \cdot 6.21 + 0.1 \cdot 6.88 + 0.1 \cdot 7.29$	5.92
2024	8.65	$0.2 \cdot 5.55 + 0.1 \cdot 5.38 + 0.1 \cdot 5.16 + 0.1 \cdot 5.92 + 0.1 \cdot 5.68 + 0.1 \cdot 6.21 + 0.1 \cdot 6.88 + 0.1 \cdot 7.29 + 0.1 \cdot 8.65$	6.23
2025	7.24	$0.1 \cdot 5.55 + 0.1 \cdot 5.38 + 0.1 \cdot 5.16 + 0.1 \cdot 5.92 + 0.1 \cdot 5.68 + 0.1 \cdot 6.21 + 0.1 \cdot 6.88 + 0.1 \cdot 7.29 + 0.1 \cdot 8.65 + 0.1 \cdot 7.24$	6.40
2026	6.99	$0.1 \cdot 5.38 + 0.1 \cdot 5.16 + 0.1 \cdot 5.92 + 0.1 \cdot 5.68 + 0.1 \cdot 6.21 + 0.1 \cdot 6.88 + 0.1 \cdot 7.29 + 0.1 \cdot 8.65 + 0.1 \cdot 7.24 + 0.1 \cdot 6.99$	6.54

Source: AER analysis.