# Better Regulation

# Explanatory statement

# Draft rate of return guideline

August 2013

# Shortened forms

| Shortened term | Full title |
|---|---|
| ACCC | Australian Competition and Consumer Commission |
| AEMC | Australian Energy Market Commission |
| AEMO | Australian Energy Market Operator |
| AER | Australian Energy Regulator |
| capex | Capital expenditure |
| common framework | Refers to the largely consistent rules framework on the rate of return that applies to gas service providers (NGR), electricity distribution network service providers (NER chapter 6) and electricity transmission service providers (NER chapter 6A). |
| COSBOA | Council of Small Business Australia |
| CRG | Consumer Reference Group |
| 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. |
| DRP | Debt Risk Premium |
| ENA | Energy Networks Association |
| ERA | Economic Regulation Authority |
| EUAA | Energy Users Association of Australia |
| EURCC | Energy Users Rule Change Committee |
| FIG | The Financial Investor Group |
| MRP | Market risk premium |
| MEU | Major Energy Users Inc |
| NEL | National Electricity Law |
| NEM | National Electricity Market |
| NEO | National Electricity Objective |
| 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 |
| NGO | National Gas Objective |
| NSW T Corp | New South Wales Treasury Corporation |
| opex | Operating expenditure |
| PIAC | The Public Interest Advocacy Centre |
| The QTC | The Queensland Treasury Corporation |

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|---|---|
| RAB | Regulatory Asset Base |
| RARE | RARE Infrastructure Limited |
| RDB | Regulatory Development Branch |
| 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 |
| SFG | Strategic Finance Group Consulting |
| subsequent regulatory control period for service providers | Expected to be 1 July 2015 to 30 June 2019. |
| transitional regulatory control period for service providers | 1 July 2014—30 June 2015 |
| transitional rules | Transitional rules contained in the National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012 No. 9 (Network Regulation rule change) which the AEMC determined in November 2012. These transitional rules set out the transitional arrangements for the next ACT/NSW electricity distribution determinations. |
| 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). |

# Request for submissions

This explanatory statement is part of the Australian Energy Regulator's (AER) Better Regulation program of work, which follows from changes to the National Electricity and Gas Rules announced in November 2012 by the Australian Energy Market Commission (AEMC). The AER's approach to regulation under the new framework will be set out in a series of guidelines to be published by the end of November 2013.[1]

Interested parties are invited to make written submissions to the AER regarding the draft guideline and the accompanying explanatory statement by close of business, 11 October 2013.

On equity beta, which is relevant to the return on equity, we have commissioned a report which updates the empirical estimates of equity beta from those we commissioned in the context of the 2009 WACC review. We expect to release this report in September, with an accompanying note outlining our further considerations on beta and a proposed equity beta value. We will seek submissions on that material which will be taken into account in developing the final guideline.

Submissions should be sent electronically to: rateofreturn@aer.gov.au. The AER prefers that all submissions sent in an electronic format are in Microsoft Word or other text readable document form.

Alternatively, submissions can be sent to:

Mr Warwick Anderson
General Manager—Network Regulation Branch
Australian Energy Regulator
GPO Box 3131
Canberra ACT 2601

The AER prefers that all submissions be publicly available to facilitate an informed and transparent consultative process. Submissions will be treated as public documents unless otherwise requested. Parties wishing to submit confidential information are requested to:

- clearly identify the information that is the subject of the confidentiality claim

- provide a non-confidential version of the submission in a form suitable for publication.

We will place all non-confidential submissions on our website at www.aer.gov.au. For further information regarding the AER's use and disclosure of information provided to it, see the ACCC/AER Information Policy, October 2008 available on the AER website.

Please direct enquires about this paper, or about lodging a submission to the Network Regulation Branch of the AER on (02) 6243 1233 or rateofreturn@aer.gov.au.

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[1]    Further details on the consultation processes and other guidelines are available at http://www.aer.gov.au/node/18824.

# Contents

# Executive summary

The AER is the independent regulator for the Australian National Energy Market (NEM). We are guided in our role by the national electricity and gas objectives. Enshrined in the Electricity and Gas Laws, these objectives focus us on promoting the long term interests of consumers.

In 2012, the Australian Energy Market Commission (AEMC) amended the electricity and gas rules to require us to develop a guideline which outlines our approach to setting the rate of return for both regulated electricity and gas network businesses in the NEM.

## The requirements of the rules and the new regulatory framework

This explanatory statement accompanies our draft rate of return guideline for electricity and gas transmission and distribution networks (the draft guideline). The rules require us to develop this guideline and to specify within it:[2]

- the method we will use to estimate the allowed rate of return (includes the return on equity and the return on debt) for electricity and gas networks

- the method we will use to estimate the value of imputation tax credits used to establish a benchmark corporate income tax allowance

- how these methods will result in an estimated return on equity, return on debt and value for imputation tax credits which is consistent with the allowed rate of return objective.

The rules require us to determine an allowed rate of return that achieves the allowed rate of return objective at the time we make a revenue or access arrangement determination. The allowed rate of return objective is:[3]

> …that the rate of return for a [regulated network] 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 respect of the provision of [regulated services].

The guideline will be non-binding on us in determining the allowed rate of return or on service providers in proposing their allowed rate of return as part of their revenue proposals. Should we decide to depart from the guideline we would provide reasons for doing so. Equally, while it is open to service providers to move away from the guideline within their specific revenue proposals, the rules require that they provide reasons for a proposal to depart from the approach set out in the guideline.

The rules also require us to set out in the guideline the estimation methods, financial models, market data and other evidence that we propose to take into account in estimating the return on equity, return on debt and the value of imputation tax credits.[4] In doing so, the rules require us to exercise our regulatory judgement in estimating the allowed rate of return. We have proposed a number of criteria to inform our regulatory judgement. Our draft guideline explains how we propose to exercise our judgement.

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[2]   NER, cl. 6.5.2(n)(1); NGR, r. 87(13).
[3]   NER, cl. 6.5.2(c) and cl. 6A.6.2(c); NGR, r. 87(3).
[4]   NER, cl. 6.5.2(n)(2); NGR, r. 87(14)(b).

We consider that our approach is consistent with the features of a good rate of return framework outlined by the AEMC.[5] As such, we consider our proposed approach promotes the national electricity and gas objectives and will meet the allowed rate of return objective. In particular, our proposed approach has regard to the:

- estimation of the allowed rate of return for a benchmark efficient entity having regard to a service provider's efficient financing costs

- application of assessment criteria to guide our selection and use of the methods and data which will inform our assessment of rate of return

- adoption of an approach that is flexible to deal with changing market conditions and new evidence but at the same time provides sufficient certainty regarding our approach to estimating the rate of return

- promotion of more effective consumer participation through a more accessible consultation process.

The major features we have proposed in the draft guideline include:

- Considering a broad range of material in arriving at a point estimate for the return on equity. We would continue to use the Sharpe–Lintner Capital Asset Pricing Model (CAPM) for estimating a starting point estimate and a range for the return on equity. However, we would use the key conclusion from the Black CAPM and dividend growth model estimates to inform the input parameters we use to estimate the return on equity using the Sharpe–Lintner CAPM model. We would also have regard to the estimated return on equity from the Wright approach, valuation and broker reports, and other regulators. Where appropriate, this information may lead us to adjust the output of the Sharpe–Lintner CAPM model.

- Applying a trailing average portfolio approach for estimating the return on debt. The trailing average will be calculated using a simple seven year average and will be updated annually. There would be a transition period from the current 'on the day' approach to the trailing average portfolio approach.

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

Further details on key aspects of our proposed draft guideline are outlined below.

## Benchmark efficient entity

We propose to define the benchmark efficient entity one whose only activity is providing electricity and gas network services (pure play) and is regulated and operating within Australia.

We do not consider that a separate benchmark for electricity or gas businesses is warranted based on the evidence before us. In reaching this view we consider that the regulatory framework has features that reduce the risk faced by the owners of these networks. This conclusion is supported by material we have seen from credit rating agencies. We therefore consider that the risks faced by gas and electricity businesses are sufficiently similar to warrant only one benchmark across all businesses.

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[5]    AEMC, *Final Position Paper, National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012; National Gas Amendment (Price and Revenue Regulation of Gas Services) Rule 2012*,15 November 2012, pp. 26-29.

Our proposed approach to the definition of the benchmark efficient entity is discussed in chapter three of this explanatory statement and chapter three of the draft guideline.

## Overall rate of return

The overall rate of return will be estimated by applying a nominal vanilla post-tax weighted average cost of capital (WACC) formula. The use of a nominal vanilla post-tax WACC is a requirement of the electricity and gas rules, and was therefore not within the scope of the AER's review as set out in this guideline. The rate of return is a weighted average of the return on equity and the return on debt. The weights used reflect the relative proportion of equity and debt in the total financing arrangements of the business. This is based on the AER's estimate of the gearing ratio for the benchmark efficient entity. The tax effects are captured in the corporate income tax building block of the post-tax revenue model, and include an adjustment for the value of imputation tax credits.

We propose that the overall rate of return will be updated annually. This is consistent with our proposal for the return on debt to be updated annually. The return on equity will be set for the duration of the regulatory period.

The overall rate of return will be a point estimate, reflecting the use of point estimates for the return on equity, return on debt and gearing level. We propose that the return on equity point estimate will be chosen from within a range for the return on equity.

Reasonableness tests on the overall rate of return are limited by the small amount of information which is available for assessment at the higher overall rate of return level, rather than at the return on equity or debt level. Due to limitations arising from a lack of comparability, we propose that only regulatory asset base (RAB) acquisition and trading multiples will be used as reasonableness tests on the overall rate of return.

Our proposed approach to the overall rate of return is discussed in chapter four of this explanatory statement and chapter four of the draft guideline.

## Return on equity

To determine an estimate of the return on equity that is consistent with the allowed rate of return objective, we have proposed an approach that has regard to a broad range of relevant material. This approach uses the Sharpe–Lintner CAPM as the foundation model, but draws on additional models and information to determine the final return on equity point estimate. The use of the Sharpe–Lintner CAPM promotes simplicity, transparency and certainty of process.

Our proposed approach is summarised in the following flow chart. Steps one and two we have completed. Our draft assessment of these steps we set out in this explanatory statement. Step three will occur partly at the time of the guideline and partly at the time of the reset determination.[6] An explanation of our approach to steps four to six is set out in this explanatory statement, however the application of these steps will occur at the time of each reset determination.

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[6]  That is, in the draft guideline we set out our approach to estimating the risk free rate, and the value for the equity beta we propose to include in the final guideline, whereas the value for the market risk premium we propose to determine at the time of each reset determination.

**Proposed approach to estimating the return on equity**



Figure flowchart content:

**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 →

NO ↓

Use to inform foundation model?

YES →

NO ↓

Use to inform overall ROE?

YES →

NO ↓

This method, model, data or evidence is not used to estimate the ROE.

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

**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.

**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.

The risk free rate can be observed with reasonable certainty, and so we will estimate a point estimate for the risk free rate at the time of each determination. For the risk free rate used in the return on equity calculation, we propose that point estimate will be based on the prevailing yield on 10 year Commonwealth Government Securities (CGS) over a short (20 business day) period as close as practicably possible to the commencement of the regulatory period. The dates of the averaging period will be determined by the AER and disclosed in the draft decision of each determination.

The equity beta and market risk premium (MRP) cannot be as readily observed. In recognition of this uncertainty we propose to estimate ranges for these parameters from within which we will select a point estimate for each parameter. The adoption of point estimates and ranges for some parameters will consequently result in a range for the return on equity based on a Sharpe–Lintner CAPM

The equity beta parameter for the estimation of the return on equity is expected to be included in the guideline. We plan to consult in mid-September on our approach to this. The MRP will be considered at each determination. We propose that our final return on equity estimate will always be chosen within the range set by Sharpe–Lintner CAPM. But this final return on equity estimate might not always exactly reflect the point estimate set by the Sharpe–Lintner CAPM. This is because after we have determined our estimate from the Sharpe–Lintner CAPM, we will also have regard to other information on the return on equity. We propose to consider an alternative implementation of the CAPM (by Professor Wright), and the returns on equity adopted by brokers and valuers. Having regard to this other information might lead us to adopt a final return on equity point estimate that differs from the Sharpe–Lintner CAPM point estimate. Where we make such a departure, the final return on equity estimate will be a multiple of 25 basis points. This approach recognises the uncertainty inherent in estimating equity returns, but also provides an appropriate level of transparency, simplicity, certainty and replicability.

We consider that our proposed approach appropriately balances the theoretical and empirical evidence with the characteristics of regulated infrastructure. For example, our implementation of the Sharpe–Lintner CAPM will result in estimates of the return on equity that may vary over time. Alternatively, the Wright approach for implementing the Sharpe–Lintner CAPM will result in estimates of the return on equity that may be relatively stable over time. The informative use of these implementations of the Sharpe–Lintner CAPM, in addition to other information, is expected to lead to more stable estimates of the return on equity than under our previous approach.

Our proposed approach to the return on equity is discussed in chapter five of this explanatory statement and chapter five of the draft guideline.
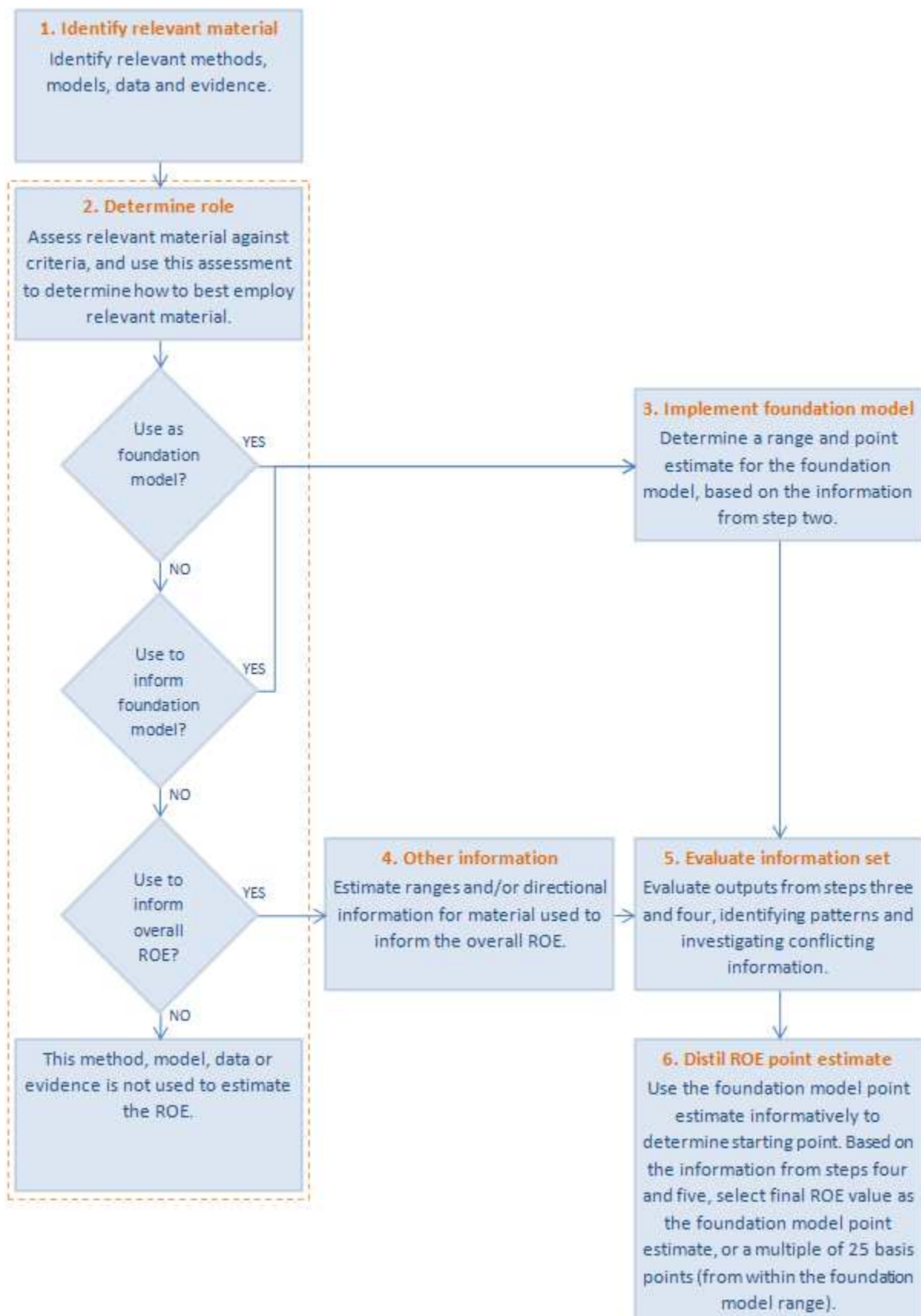
## Return on debt

We propose to apply a trailing average portfolio approach to estimate the return on debt. This approach means that the allowed return on debt more closely aligns with the efficient debt financing practices of regulated businesses and means that prices are likely to be less volatile over time. The trailing average would be calculated over a seven year period. The annual updating of the trailing average should also reduce the potential for a mismatch between the allowed return on debt and the actual return on debt for a benchmark efficient entity.

We consider that adoption of the trailing average portfolio approach to the estimation of the return on debt is a major change in the regulatory framework. We arrived at this decision through an extensive consultation process and analysis. A major change in regulatory approach requires a strong level of commitment from all stakeholders. Further, we consider that one of the objectives of the guideline and the Better Regulation program is to provide regulatory certainty and transparency. We do not think

that the use of a 'menu approach' where a number of approaches are specified in the guideline would be consistent with the commitment required for this regulatory change.

In addition, the draft guideline specifies a gradual transition from the current approach of using prevailing rates as close as possible to the start of the regulatory control period (the 'on the day' approach) to the trailing average portfolio approach. The transition will occur over a period of seven years and will apply to all businesses. Further, the guideline sets out the proposed method to calculate the allowed return on debt. In particular, we propose to use an independent third party data service provider (such as Bloomberg) to estimate the allowed return on debt. Where there is a choice between independent third party data service providers our preference will be to use a third party data provider that has a transparent method. We also propose that the return on debt will be calculated over 10 or more consecutive business days, using yield estimates for a seven year debt term and the closest proximate for a BBB+ credit rating or its equivalent.

The draft guideline also specifies that the trailing average must be updated during a regulatory control period using the method set out in the draft guideline. We propose to specify in a service provider's determination how an automatic update to the trailing average can be applied in circumstances where the method of calculating the allowed return on debt is no longer available or has been amended during a service provider's regulatory control period.

Our proposed approach to, and implementation of, the return on debt are discussed in chapters six and seven of this explanatory statement and chapter six of the draft guideline.

## Imputation credits

Under a post-tax framework, which is required by the electricity and gas rules, the value of imputation credits is included within the calculation of the corporate tax liability.[7] This is reflected in the revenue cash flows via the corporate tax component of the building block model. We propose that the value of imputation credits is based on the product of the payout ratio and the utilisation rate. We also propose an approach that has regard to a broad range of information to inform these inputs—including the equity ownership approach, taxation statistics and implied market value studies. Having had regard to this material, and the strengths and weaknesses of each source of evidence, at this point in time we consider that 0.5 is a reasonable estimate of the value of imputation tax credits.

Our proposed approach to the valuation of imputation tax credits is discussed in chapter eight of this explanatory statement and chapter seven of the draft guideline.

## Consultation approach

In preparing this draft guideline we have consulted extensively with stakeholders. This consultation included the publication of an issues paper in December 2012 and a consultation paper in May 2013 as well as subsequent workshops and meetings with sub-groups on various elements of our proposed rate of return assessment approach. We will be holding further forums on the draft guideline in the coming months.

In developing our guideline we have been mindful of both investor and consumer interests as referenced in the national electricity and gas objectives and in the revenue and pricing principles. In particular we will be taking a long-term perspective, recognising consumer interests in terms of price

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[7]   The value of imputation credits is an estimate of the expected proportion of company tax which is returned to the representative investor through utilisation of imputation credits.

impacts as well as on service delivery and network security arising from potential under and over investment.

We welcome direct input from interested parties into this draft guideline and explanatory statement, and the development of the final guideline over the next few months. Positions put forward to the draft guideline will form a basis for future discussion with stakeholders.

Our approach to consultation is guided by the overarching approach that has been adopted for the Better Regulation work program.[8] Written submissions are invited in response to this explanatory statement and the draft guideline by close of business, Friday, 11 October 2013. Enquiries can be directed to rateofreturn@aer.gov.au.

On the equity beta, which is relevant to the return on equity, we have commissioned a report which updates the empirical estimates of equity betas of Australian energy networks from that which we commissioned in the context of the 2009 WACC review. We expect to release this report in September with an accompanying note setting out further considerations on the equity beta from us and a proposed equity beta value. We will seek submissions on that material which will be taken into account in the final guideline.

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[8]     AER, *Better regulation issues paper*, 10 December 2012.

# 1    Introduction

The Australian Energy Regulator (AER) is responsible for the economic regulation of electricity transmission and distribution services in eastern and southern Australia under chapters 6 and 6A of the National Electricity Rules (NER). We monitor the wholesale electricity market and are responsible for compliance with and enforcement of the NER. We have similar roles for gas distribution and transmission under the National Gas Rules (NGR). We also regulate retail energy markets in the ACT, South Australia, Tasmania (electricity only) and New South Wales.

Our Better Regulation program involves the publication of several guidelines, including publication of the rate of return guideline (the guideline). The guideline will set out the approach we intend to take to determining the allowed rate of return in accordance with the National Electricity Law (NEL), the National Gas Law (NGL) (collectively, the law and rules).

This explanatory statement is the third paper in our consultation process for developing the draft guideline for the regulated electricity and gas transmission and distribution network service providers (the 'service providers'). It follows the Australian Energy Market Commission's (AEMC) changes to the NER and NGR on 29 November 2012. The aim of these reforms is to deliver an improved regulatory framework that focuses on the long term interests of energy consumers.

This chapter provides an introduction and background to the guidelines. First, the rate of return framework is discussed. This is followed by a summary of the role of the guideline and the applicability of this guideline to forthcoming regulatory determinations. Lastly, our approach to consultation is outlined.

## 1.1    Rate of return regulatory framework

The return on capital often represents the largest component of the revenue determinations of service providers. A service provider should be provided with a reasonable opportunity to recover at least the efficient costs it incurs in providing regulated services and complying with a regulatory obligation or requirement or making a regulatory payment. The allowed rate of return allows service providers to obtain necessary funds from capital markets to fund capital investments and service the debt they incur in borrowing the funds. The rate of return can make up approximately 50 per cent of the revenue needs for a service provider. Therefore, the rate of return is a key element of the network charges that consumers pay.

The previous frameworks for estimating the rate of return for electricity transmission, electricity distribution and gas service providers differed in a number of respects, in particular the extent of prescription in the rules and whether the estimate was made at each determination or in a periodic review.[9]

The changes to the NER and NGR made by the AEMC were initiated by the AER in September 2011.[10] In the rule change request, we stated:[11]

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[9]  The former frameworks refer to frameworks prior to issuance of AEMC's final determination published on 29 November 2012 which sets out the amendments that have been made to the NER and the NGR. The former frameworks are provided in chapter 6A of the NER for electricity transmission, chapter 6 of the NER for electricity distribution, and rule 87 of the NGR for gas service providers.

[10] For more on the rule change process, see: http://aemc.gov.au/Electricity/Rule-changes/Completed/economic-regulation-of-network-service-providers-.html.

[11] AER, *Cover letter to AEMC - Rule change proposal - energy network regulation reform*, 29 September 2011, see: http://www.aemc.gov.au/electricity/rule-changes/erc0134--initiation-documents.html.

> The current restrictions on an objective assessment of the efficiency or the necessity of expenditure proposed by electricity businesses is causing consumers to pay more than they should for a safe and reliable supply of electricity services. Our proposed changes allow for a more effective and robust assessment of the costs proposed by electricity network businesses.
>
> …The AER is also proposing a consistent approach for setting the rate of return on investment for gas and electricity network businesses. These changes would provide certainty for investors while ensuring that the regulator's approach can keep pace with changing financing practices.

The AEMC was concerned that the AER should be better able to respond to changing financial market conditions and the availability of new evidence. In its final determination, the AEMC concluded that none of the previous rate of return frameworks was capable of best fulfilling the requirements of the National Electricity Objective (NEO), the National Gas Objective (NGO) and the Revenue and Pricing Principles (RPP). The AEMC considered that a new rate of return framework was therefore needed.[12]

After an extensive consultation process, the AEMC amended the rules to include new requirements relating to the framework for estimating the rate of return on capital. The new rules require us to determine an allowed rate of return that achieves the allowed rate of return objective at the time we make a revenue or access arrangement determination. The allowed rate of return for a regulatory year must be a weighted average of the return on equity for the regulatory control period in which that regulatory year occurs and the return on debt for that regulatory year.[13] The allowed rate of return objective is:[14]

> …that the rate of return for a [regulated network] 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 respect of the provision of [regulated services].

The new rules give us the discretion to adopt the approach we consider most appropriate to estimate the rate of return with the ability to take into account a wider range of relevant estimation methods, financial models, market data and other evidence as well as considering inter-relationships between parameter values. This will enable us to determine the best estimate of the required rate of return at the time of each regulatory determination.

Further, this aspect of the new rate of return framework incorporates a greater degree of regulatory judgement than did the previous framework. As part of the new framework, the AEMC has not included any preferred methods for estimating components of the rate of return. Instead, the AEMC has provided high-level principles to guide the estimation of the rate of return consistent with achieving the overall allowed rate of return objective.

To assist us in this assessment process and to provide greater transparency around this, we are proposing a set of criteria which we will apply in making judgements and decisions about the estimation methods, financial models, market data and other evidence. This discussed in chapter two.

Further, we consider that the NEO, NGO and the overall rate of return objective will be best achieved through the exercise of regulatory practices that:

- recognise the desirability of consistent approaches to regulation across the energy industry, so as to promote economic efficiency

- promote incentives to finance efficiently

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[12]   AEMC, *Final determination*, 29 November 2012, p. 42.
[13]   NER, cl. 6.5.2(d), cl. 6A.5.2(d).
[14]   NER, cl. 6.5.2(c) and cl. 6A.6.2(c); NGR, r. 87(3).

- promote reasoned, predictable and transparent decision making

- promote flexibility and adaptability, to allow us to make decisions in changing circumstances, and to take account of a wider range of assessment methods and information in estimating the rate of return; and

- improve the regulatory determination process to allow us adequate time for decision making, to enhance consumer engagement, and to increase transparency and accountability.

In our view, the framework allows us to focus on the overall objective of making decisions that are in the long-term interests of consumers. In essence this requires the regulatory process to look not only at the short term impact of proposals but also how these will affect price and service outcomes for customers over a longer period. It is important to keep this longer term perspective in mind when considering improvements to our regulatory approaches. In keeping with the overall objectives of incentive regulation, the overall rate of return should provide service providers effective incentives to promote economic efficiency with respect to services they provide.

The desirability of achieving the specific aims of incentive regulation may be linked back to the efficiency requirements of rules. For example, the revenue and pricing principles refer explicitly to the need to provide effective incentives to promote economic efficiency.[15]

A service provider should be provided with effective incentives in order to promote economic efficiency with respect to the regulated services that it provides, this includes promoting the:

- efficient investment in a distribution or transmission system

- efficient provision of energy network services

- efficient use of the distribution system or transmission system.[16]

Accordingly, the RPPs are an important framework issue for assessing how the national electricity and gas objectives and the rate of return objective interrelate. Everything we do in assessing the rate of return must be consistent with the NEO and NGO. This is more likely to be achieved where our decisions are consistent with the principles of incentive based regulation.

For example, it is important that the regulatory framework delivers incentives on the service providers to undertake efficient investment. This will be achieved where the required rate of return is set at the level which is commensurate with the risks facing service providers. In circumstances where the allowed rate of return is higher (lower) than the required rate of return, this may lead to inefficient over investment or under investment.

## 1.2    The role of the guideline

The new rules require us to develop a rate of return guideline that sets out the approach we intend to take to determining the allowed rate of return for both electricity and gas service providers. To give effect to the new rules on the rate of return, we are required to develop and a publish rate of return guideline covering:

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[15]    NEL, s. 7A; for NGL, see section 24.
[16]    NEL, s. 7A; Similar provisions are included for the NGL, see section 24.

(1) the methodologies that the AER proposes to use in estimating the allowed rate of return, including how those methodologies are proposed to result in the determination of a return on equity and a return on debt in a way that is consistent the allowed rate of return objective; and

(2) the estimation methods, financial models, market data and other evidence we propose to take into account in estimating the return on equity, the return on debt and the value of imputation credits.[17]

Accordingly, the draft guideline sets out:

- our proposed positions on the elements for assessing the rate of return including the return on equity and return on debt

- the estimation methods, financial models, market data and other evidence that we propose to take into account when estimating the allowed rate of return

- the way in which we propose to take into account the estimation methods, financial models, market data or other evidence.

- The aim of the guideline is to provide sufficient detail to allow a service provider or other stakeholders to understand our approach and how we will exercise our discretion consistent with the rate of return objective.

In its final determination, the AEMC specifically stated that the guideline would be non-binding on us or on service providers. Although the guideline is non–binding in nature, in practice we and the service providers will be expected to follow the guideline when setting the rate of return. In the event that a service provider or we seek to depart from the guideline in proposing an alternative approach to setting the rate of return as part of a regulatory determination, then they or us would need to provide compelling reasons and evidence for a proposed departure.

The rules require us to review the rate of return guideline at least every three years. In our view subsequent guidelines are likely to be limited to incremental changes in approach.

## 1.3 Applicability of this review to forthcoming regulatory determinations

Once completed, we intend to apply the guideline to the next round of regulatory determinations to be submitted to us in 2014 (see table 1.1 and table 1.2).

The rules include transitional arrangements to enable us to apply the new rules as soon as possible. This will allow the benefits of the new rules to flow through to consumers more quickly.

**Table 1.1        Timetable for regulatory determinations (electricity)**

| Service provider | | Framework and approach paper published | Regulatory proposal due | Regulatory period commence |
|---|---|---|---|---|
| 2014–15 Group of NSPs | TransGrid and Transend (NSW and Tas transmission) | 31 January 2014 | Transitional: 31 January 2014 | Transitional: 1 July 2014 |

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[17]    NER, cl. 6.5.3 and cl. 6A.6.4.

| | | | Full: 31 May 2014 | Full: 1 July 2015 |
|---|---|---|---|---|
| | ActewAGL, Ausgrid, Endeavour Energy and Essential Energy (ACT and NSW distribution) | Part 1: 31 March 2013<br>Part 2: 31 January 2014 | Transitional: 31 January 2014<br>Full: 31 May 2014 | Transitional: 1 July 2014<br>Full: 1 July 2015 |
| | Directlink (Interconnector between Qld and NSW) | 31 January 2014 | 31 May 2014 | 1 July 2015 |
| 2015–16 Group of DNSPs | Ergon Energy, Energex and SA Power Networks (Qld and SA distribution) | 30 April 2014 | 31 October 2014 | 1 July 2015 |
| | Jemena, United Energy, Citipower, Powercor and SP AusNet (Vic distribution) | 31 October 2014 | 30 April 2015 | 1 January 2016 |
| Post 2016 Group | Aurora Energy (Tas distribution) | 31 July 2015 | 31 January 2016 | 1 July 2017 |
| | Powerlink (Qld transmission) | 31 July 2015 | 31 January 2016 | 1 July 2017 |
| | ElectraNet (SA transmission) | 31 July 2016 | 31 January 2017 | 1 July 2018 |
| | Murraylink (Interconnector between SA and Vic) | 31 July 2016 | 31 January 2017 | 1 July 2018 |

Source:    AEMC, *Final rule determination*, 29 November 2012, p. 229.

**Table 1.2        Timetable for regulatory determinations (gas)**

| Service provider | | Regulatory proposal due | Access arrangement period commence |
|---|---|---|---|
| Gas Distribution | | | |
| 2014–15 Group of NSPs | Envestra (Wagga Wagga), Jemena (NSW Gas Distribution) | June 2014 | 1 July 2015 |
| Post 2016 Group | ActewAGL (ACT Gas Distribution) | June 2015 | 1 July 2016 |
| | APT Allgas, Envestra (Qld), Envestra (SA)<br>(Qld and SA Gas Distribution) | June 2015 | 1 July 2016 |
| | Envestra (Albury), SP AusNet, Multinet, Envestra (Vic)<br>(Vic Gas Distribution) | December 2016 | 1 January 2018 |
| Gas Transmission | | | |

| 2014–15 NSP | Dawson valley pipeline (Qld Gas Transmission) | September 2014 | September 2015 |
|---|---|---|---|
| | Amadeus gas pipeline (NT Gas Transmission) | July 2015 | 1 July 2016 |
| Post 2016 Group | Roma to Brisbane pipeline (Qld Gas Transmission) | August 2016 | 1 July 2017 |
| | APA GasNet (Vic Gas Transmission) | December 2016 | 1 January 2018 |

Source:    AER analysis.

## 1.4    Consultation process

Important to our success in developing the guideline will be to hear from all stakeholders on the matters that are important to them. In developing the guideline we have undertaken extensive consultation process to provide stakeholders with multiple opportunities to raise and discuss matters. We will continue the process of consultation following the release of the draft guideline. This will include seeking comments on the draft guideline, holding further meetings and discussions with stakeholders, if requested. We expect this process will enable stakeholders to have further input to the development of our assessment methods.

This comprehensive consultation process is intended to ensure that the guideline addresses all relevant issues and reduces the need for any unnecessary departures from the guideline. This should also minimise the scope for extensive review of the proposed approach at each revenue or access arrangement determination. This should provide stakeholders with greater certainty and predictability as to how we will assess rate of return requirements at each determination. A brief update on the consultation process so far undertaken is given below:

- On 18 December 2012, we released an issues paper. This paper raised and sought comment of a broad range of issues at a high level with no firm positions taken by us.

- On 5 February 2013, we hosted a forum on the development of the guideline. A range of stakeholders including representatives of regulated energy businesses, energy users, state regulatory authorities, government statutory authorities and investors in regulated utilities participated in this forum. At the forum we sought high level views from participants on key matters. Forum participants discussed issues set out in our issues paper. Stakeholders sought clarification on how we would apply the principles set out in its issues paper and explain how these principles related to the NEO, NGO and RPP.

- On 25 and 26 February 2013 we held two sub-groups workshops on: i) the overall rate of return and cost of equity ii) the cost of debt. Again a range of stakeholders attended these workshops and discussed the key issues relating to development of guideline including the role of the principles, the nature of the benchmark efficient entity, the use of financial models and approaches for estimating the cost of equity and cost of debt.

- In May 2013 we released a consultation paper. This paper sought comments on our preliminary positions on some elements of the rate of return.

- On 3 and 4 June 2013 we held two sub-group workshops on: i) approach to return on debt benchmark and ii) return on equity—models assessment. A large number of stakeholders attended these workshops and discussed the key issues relating to approach to return on debt-benchmark ('on-the day' and portfolio), trailing average, annual updating of a trailing average and weighting, transitional arrangements and various models used for assessing the return on equity.

- On 18 June 3013 we held another workshop on relationship between risk and the rate of return, and implications for the definition of the benchmark efficient entity. Again a large number of stakeholders and the consultants attended this workshop. Two consultants from Frontier economics made presentations on: i) characteristics and exposures of energy networks in general and ii) differences in risk exposures of different types of energy networks. Associate professor Graham Partington made a presentation on accounting for risk within the regulatory framework. The consultants also responded to the stakeholders questions.

- In addition, we have held a number of bilateral meetings with the QTC, TCorp, IPART, APIA, Consumer Reference Group (CRG), EUAA, ENA, PIAC, Merrill Lynch, Moody's, Standard and Poor's, Goldman Sachs, Westpac.

We have published notes on key aspects of the discussions we had at the public forums. These can be found on our website at http://www.aer.gov.au/node/18859.

### Next steps

A key element of our consultation over the coming months will be a public forum and other targeted forums if required. This will allow stakeholders the opportunity to provide more detailed input on specific aspects of the draft guideline. Together with written submissions on this draft guideline we will use this dialogue to complete our final guideline by December 2013. Table 1.3 sets out our proposed consultation timeframes for developing the final guideline.

**Table 1.3     Rate of return guideline—key milestones**

| Date | Milestone |
| --- | --- |
| 30 August 2013 | Publish draft guideline and explanatory statement |
| 30 August 2013 | Briefing to stakeholders on draft guideline via teleconference |
| Mid-September | Release equity beta material for consultation |
| Third week of September 2013 | Public forum on draft guideline |
| 11 October 2013 | Submissions close on draft guideline and equity beta |
| Mid December 2013 | Publish final guideline |

Source:    AER analysis.

## 1.5   Structure of this explanatory statement

This explanatory statement is structured as follows:

- chapter 2 discusses our proposed approach to application of criteria for assessing the rate of return

- chapter 3 discusses our proposed definition of benchmark efficient entity and compensation of risk

- chapter 4 discusses our proposed approach to estimating the overall return of return

- chapter 5 discusses the proposed approach to estimating the return on equity

- chapter 6 discusses our proposed approach to estimating the return on debt

- chapter 7 discusses our implementation of the estimated return on debt

- chapter 8 discusses our proposed approach to estimating imputation credits.

# 2 Application of criteria

This chapter discusses our understanding of what is meant by the terms 'estimation methods, financial models, market data and other evidence' and how they may be taken into account in setting the allowed rate of return. We have set out some criteria that we propose to use to assess the merits of this information and to develop the draft guideline.

## 2.1 Background

The AEMC in its final rule determination considered that the estimation of the required rate of return could be improved by permitting us to take account of a broad range of information.[18] The AEMC specifically did not include in the new rules any preferred methods for determining the rate of return.[19] Instead it provided for the AER to exercise its judgement as to the best approach:[20]

> Estimating the rate of return ultimately requires a regulator to exercise judgement about the analytical techniques and evidence to use to make an estimate that is commensurate with efficient financing costs. The new framework does not prescribe methodologies or lock-in specific benchmark characteristics other than providing high-level principles that should be taken into account when estimating various components, such as return on equity and debt. While the judgement as to the best approach is left to the regulator, the preferred methods must be developed to meet the overall allowed rate of [return] objective.

To guide our exercise of judgement, the new rules specify that we have regard to 'estimation methods, financial models, market data and other evidence' relevant to the assessment of the allowed rate of return.[21]

While the judgement as to the best approach is left to the regulator, the preferred methods must be developed to meet the overall allowed rate of return objective.

The AEMC considered that rate of return decisions should be principles based.[22] Consistent with the AEMC advice, in our issues paper we proposed a set of 'principles' that we considered would be used to inform our decisions on the information we would have regard to in achieving the allowed rate of return objective. After extensive consultation with stakeholders, in our consultation paper we refined these principles and categorised them as 'criteria' instead of 'principles' as discussed in section 2.4.

## 2.2 Role of the criteria

Estimating the allowed rate of return ultimately requires us to exercise judgement about the analytical techniques and evidence to use. The new rules framework does not prescribe any specific methods or lock in specific benchmark characteristics other than providing high-level principles that should be taken into account when estimating the allowed return on equity and debt. The new framework permits us considerable flexibility in determining the allowed rate of return. To provide a greater degree of certainty and transparency for our future determinations, we consider it helpful to outline a set of criteria that will guide stakeholders as to our decision making with respect to assessing or determining what approaches, methods and sources of information can best be used to satisfy the rate of return objective.

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[18]   AEMC, *Rule determination: National electricity amendment (Economic regulation of network service providers) Rule 2012: National gas amendment (Price and revenue regulation of gas services) Rule 2012,* 29 November 2012, p. 67.
[19]   See, for example, AEMC, *Final rule change determination*, 29 November 2012, p. iv.
[20]   AEMC, *Final rule determination*, 29 November 2012, p. 38.
[21]   NER, cl. 6.5.2(e) and cl. 6A.6.2(e); NGR, r. 87(5).
[22]   AEMC, *Final rule determination*, 29 November 2012, pp. iv, 38, 42–44, 56–57.

We consider that we would need to exercise judgment in meeting the requirements of the NEL/NGL and the rules, and that our criteria would help to provide a framework for assessing the rate of return. This will enhance transparency and predictability for stakeholders.

The criteria are not intended to supplant the NEL, NGL or the rules. Rather they are subordinate to the requirements set out in those instruments.

## 2.3 Estimation methods, financial models, market data and other evidence

The new rules require us to set out in the guideline:[23]

- the methods we propose to use

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

In determining the allowed rate of return, we must have regard to 'relevant estimation methods, financial models, market data and other evidence'.[24]

Our understanding of what these terms mean and how we may use them in determinations is discussed below. The criteria listed in section 2.5 provide a framework for assessing the relevance and quality of this information. We assess the return on equity models and information against these criteria in appendices E and F.

### 2.3.1 Estimation methods

We consider estimation methods to mean some processes or procedures used to compute an estimate of a parameter within a model or a component of the rate of return.

An example of an estimation method is the method we have previously used to estimate the risk free rate. To do so we have averaged the observed yield on 10 year Commonwealth Government Securities (CGS) over a defined period. Another example is the use of historical excess returns to inform the forward looking market risk premium (MRP) estimates in the CAPM.

We will use estimation methods to determine parameters, values or any other inputs to the rate of return where a financial model is not applicable, or to support a financial model.

### 2.3.2 Financial models

We consider financial models to mean an abstract representation of a financial decision-making situation. Examples of financial models include the Sharpe–Lintner CAPM, the Black CAPM, the Fama–French three factor model and the dividend growth model (DGM). These models are discussed in greater detail in appendices E and F.

We will use financial models to estimate the return on equity. We may also use one financial model to estimate parameters within another financial model. An example might be using a DGM to estimate the MRP within the Sharpe–Lintner CAPM.

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[23] NER, cls. 6.5.2(n) and 6A.6.2(n); NGR, r.87(14).
[24] NER, cls. 6.5.2(e)(1) and 6A.6.2(e)(1); NGR, r.87(5)(a).

The strength of financial models is that they provide a consistent and coherent framework for considering the rate of return and its components. We expect that financial models will continue to play a central role in the determination of the allowed rate of return. Our previous use of the Sharpe–Lintner CAPM has rested upon its sound theoretical foundations and strong degree of acceptance and use in practice, not just by the regulators in Australia and overseas but also by capital market participants more generally.[25]

### 2.3.3 Market data

We consider market data to include:

- data on prices, maturities, and terms and conditions of government and non-government bonds, financial derivatives, and other financial instruments

- data on equity prices and ratios such as price earnings ratios and RAB multiples

- data on financial structures such as gearing levels and credit ratings.

An example of market data is the data we have used in the past to determine the risk free rate. We have used data on the observed yield on 10 year CGS. Another example of market data is the data on corporate bond yields. These can be used to estimate the return on debt directly or cross-check estimates of the return on debt derived from other sources such as the Bloomberg fair value curves.

We might use market data as inputs to estimation methods or financial models or as alternative estimates and cross-checks of the outputs of those methods and models.

### 2.3.4 Other evidence

Examples of other evidence might include broker reports, experts' reports or feedback from market participants and stakeholders.

We might use other evidence at any point in the estimation of the rate of return, where we consider it will contribute to meeting the allowed rate of return objective. This may be as a cross-check on the overall WACC or return on equity estimates, or as a consideration when estimating a particular parameter value.

## 2.4 Our assessment criteria for the application of regulatory judgement

In its final determination the AEMC noted the importance for the methods for deriving parameter values 'to be driven by principles and to reflect current best practice'.[26] We agree with this view and accordingly have developed a set of principles, which we have re-termed criteria, which will assist us in assessing information used in determining the rate of return.

### 2.4.1 Principles or criteria?

'Principles' are the fundamental truths that serve as the foundation for laws, systems or reasoning, whereas 'criteria' are the standards by which judgments or decisions can be made. Principles are broader than criteria and sit below in the decision hierarchy.[27]

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[25] See, for example, Grant Samuel, *Financial Services Guide and Independent Expert's Report in relation to the takeover offer by Pipeline Partners Australia Pty Limited - Appendix 2: Selection of discount rate*, 3 August 2012, p. 1.
[26] AEMC, *Final rule determination*, 29 November 2012, p.56.
[27] See for example, oxforddictionaries.com/definition/english/criterion.

Whilst 'principles' can be seen as being broader than 'criteria', the use of the term 'criteria' supports our intent that the 'criteria' are separate and subordinate to the NEL/NGL, the rules, and the NEO/NGO. We consider that the term 'criteria' provides a more accurate indication of their role in the framework that will be used to inform the exercise of regulatory judgment for the overall rate of return. Accordingly, we used the term 'criteria' in the consultation paper and use this term in the draft guideline.

We consider that it is feasible that various estimation methods, financial models, market data and other evidence may meet some, but not all, of the specific requirements of the new rules. Similarly, potential approaches may address the new rules well in some areas, and less well in others.

Taking into account stakeholder submissions and feedback, the allowed rate of return objective, we are proposing to use a defined set of criteria in making judgements about the estimation methods, financial models, market data and other evidence we will take into account in determining the allowed rate of return. The justification for our proposed criteria is discussed in section 2.6. These criteria do not supplant the new rules. Rather, the criteria are subordinate to the NEL/NGL, the rules, and the NEO/NGO. We consider these criteria consistent with the law and rules. They also help us to ensure that regulatory outcomes meet the NEO/NGO. We consider these criteria will provide stakeholders with greater certainty, and more importantly provide a framework, as to how we intend to exercise our regulatory judgment in respect of this information, while allowing us sufficient flexibility to make decisions in changing market conditions.

We will use these criteria to assess the weight given to the available rate of return information and data. We will use the criteria to allocate weight to data that is determined relevant for estimating the allowed rate of return and ensure that we are meeting the NEO/NGO. Data and other evidence that meets only some of the criteria may be given less weight or have no weight placed on it. The criteria will therefore help us to make regulatory judgements in respect of meeting the allowed rate of return objective.

We intend to use the criteria to set out the relevant estimation methods, financial models, market data and other evidence in the guideline. However, at the time of an individual service provider's determination, we will also use these criteria to assess any information presented by that service provider that supports or departs from the methods, financial models, market data and other evidence established in the guideline.

## 2.5 The rate of return criteria

We consider the allowed rate of return objective may be best met if the proposed rate of return methods, models, market data and other evidence 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.

## 2.6 Assessment of proposed criteria

We received several submissions from stakeholders on our assessment criteria outlined in the consultation paper. Most submissions generally supported our proposed approach and criteria outlined in the consultation paper.[28] For example, PIAC submitted that:[29]

> Important to achieving these outcomes is the use of well accepted models with sound theoretical and empirical support, fit for purpose and with internal consistency, along with reliable and well-defined data sets, and implemented appropriately for the circumstances. The AER has identified a similar set of criteria in the Consultation Paper and PIAC strongly supports this approach for the reasons outlined above.

APIA submitted:[30]

> The AER's decision making 'criteria' are sound and reflect principles associated with sound economic assessment, based on rigorous analysis and common sense.

However, some of the stakeholders expressed concerns with some of our proposed criteria as discussed below. Others sought greater clarity from the guideline. A summary of the submissions received on the consultation paper is provided in appendix A.

This section provides a further explanation of our proposed criteria and responds to the relevant submissions received on the consultation paper where applicable.

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[28] Australian Pipeline Industry Association (APIA), *Response to the AER's rate of return guidelines consultation paper*, June 2013, p. 1; Major Energy Users (MEU), *Response to the AER's rate of return guidelines consultation paper*, June 2013, pp. 9–11; The Financial Investor Group (FIG), *Response to the AER's rate of return guidelines consultation paper*, 24 June 2013, pp. 13–14; Public Advocacy Centre Ltd (PIAC), *Submission to the AER's rate of return guidelines consultation paper*, 21 June 2013, p. 4; Council of Small Business Australia (COSBOA), *Comments on the AER's rate of return guidelines consultation paper,* 5 July 2013, p.5.

[29] PIAC, *Submission to the consultation paper*, June 2013, p. 4.

[30] APIA, Response *to the consultation paper*, June 2013, p. 1.

### 2.6.1 Reflective of economic and finance principles and market information (criterion one)

We consider economic and finance theory provides important insights into the conditions for achieving economic efficiency, including for the setting of revenue and prices for natural monopoly service providers. Economic theory also suggests economically efficient outcomes are in the long term interests of consumers. Hence this criterion is intended to draw on these theoretical insights to maximise the likelihood that regulatory outcomes would promote economic efficiency, and thus would best meet the NEO/NGO.

This criterion is also intended to recognise that a sound and well accepted theoretical foundation for a regulatory approach is highly desirable. This desirability was grounded within an interpretation of the NEO/NGO and its requirement for regulation to:[31]

> ...promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to price, quality, safety, reliability and security of supply of electricity.

> ...promote efficient investment in, and efficient operation and use of, natural gas services for the long term interests of consumers of natural gas with respect to price, quality, safety, reliability and security of supply of natural gas.

We consider the reference to 'economic' principles is important, as it relates to the achievement of efficiency, as set out above. It is less likely that other methods—that are not grounded in the concept of economic efficiency—would be as effective in achieving the NEO/NGO.

Most stakeholders made no specific comments on this criterion. However, the ENA was 'concerned that the way in which the AER appears to envisage employing the 'well accepted' principle will lead to conservatism in decision making which runs directly contrary to the intention of the new rule package'.[32] The ENA further submitted:[33]

> Some of the AER's suggested criteria for the development of the Guideline (such as favouring ''simplicity over complexity' or 'well-accepted' models) do not reflect a correct interpretation of how specific rules apply in the context of broader principles and objectives in the National Electricity Law or National Gas Law and do not have any clear foundation in the NEL, NGL or either the electricity or gas Rules.

> In ENA's view ensuring a sound, legally robust understanding of the legal framework is the starting point to good decision-making.

We do not agree with the ENA that employing the 'well accepted' criterion would lead to conservatism in decision making. We consider the rate of return methods that 'are well accepted' would help to deliver outcomes which are consistent with the allowed rate of return objective. The intention here is to ensure a method which is well grounded in economic theory would have widespread recognition and acceptability. We consider this would enhance the credibility and acceptability of a decision.

The allowed rate of return objective requires us to set a rate of return commensurate with the efficient financing costs of the benchmark efficient entity.[34] We do not consider this to be a theoretical proposition but one that should be consistent with observable good practice in efficient businesses. To the extent that we use models for estimating the rate of return which is consistent with those widely used in practice, we are more likely to meet the allowed rate of return objective.

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[31] NEL, section 7; NGL, section 23.
[32] Energy Networks Association (ENA), *Submission to AER's rate of return guidelines consultation paper*, June 2013, p. 15.
[33] ENA, *Response to the AER's rate of return guidelines consultation paper: summary of issues*, July 2013, p. 3.
[34] NER, cls.6.5.2(c) and 6A.6.2(c); NGR, r.87(3).

### 2.6.2 Fit for purpose (criterion two)

We consider that a method which could be considered to perform best in quantitative or qualitative terms in estimating the return on debt and the return on equity – and hence the rate of return over the regulatory years of the regulatory control period – would be most fit for purpose.

Many stakeholders made no specific comments on this criterion proposed in the consultation paper. However, several stakeholders expressed a concern regarding the second part of this criterion: 'promote simple over complex approaches, where appropriate'. For instance, APIA submitted:[35]

> While APIA agrees with this 'criterion' in principle we have a concern that there is scope for its misapplication. That is, the determination of when a simple approach should be applied over a complex one. In APIA's view simple approaches must not be chosen as a matter of convenience. It needs to be demonstrated that the benefit of a complex approach is not material before a simple approach is chosen over a complex one.

Similarly, the ENA submitted:[36]

> Setting a rate of return allowance is both very significant … and setting any such allowance inherently involves an analysis that would generally be regarded as 'complex'. … In the ENA's view there would be very limited circumstances in which promoting the simple over the complex was appropriate…

As discussed we consider that all the criteria for the exercise of regulatory discretion are subordinate to the NEL/NGL and the rules; hence there is no scope for inconsistency. We agree with APIA that simple approaches must not be chosen simply as a matter of convenience. We prefer simpler over more complex approaches as simpler models are more likely to be understandable, less prone to data mining and spurious correlation within the model and may have less data requirements. Accordingly, we consider simple models that perform as well as complex models should be preferred, all other things equal. This explanatory statement provides examples of how we intend to apply this criterion.

### 2.6.3 Implemented in accordance with good practice (criterion three)

In the issues paper, we proposed that the allowed rate of return objective may be best met if the proposed rate of return methods are implemented in accordance with best practice. After consideration of stakeholder submissions received on the issues paper, we refined this criterion to use the word 'good practice' in place of 'best practice'. The intent here is the rate of return methods that are supported by robust, transparent and replicable analysis that is derived from available credible datasets would help to deliver the allowed rate of return objective.

We consider this criterion captures the notion of sound estimation approaches. It is consistent with the desirability of best practice methods in achieving the allowed rate of return objective referred to by the AEMC.[37]

### 2.6.4 Models based on quantitative modelling (criterion four)

In the consultation paper we proposed that where models of the return on equity and debt are used, they are based on quantitative modelling that is sufficiently robust such that they are not unduly sensitive to errors in inputs estimation. We also proposed the models used should be based on quantitative modelling that avoids arbitrary filtering or adjustment of data, which does not have a sound rationale.

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[35] Australian Pipeline Industry Association (APIA), *Response to the AER's rate of return guideline consultation paper*, June 2013, p. 3.
[36] **E**NA, *Submission to the consultation paper*, June 2013, pp. 15–16.
[37] AEMC, *Final rule change determination*, 29 November 2012, pp. 42, 43, 56, 71.

The primacy of the allowed rate of return objective suggests where constituent components have been used to inform the overall rate of return estimate, these constituent components must be estimated such that they contribute to the achievement of the rate of return objective.[38] These constituent components include the return on equity and return on debt.

We do not consider that robust outcomes from quantitative modelling necessarily prescribe some sort of mechanistic interpretation. Best practice statistical approaches would help to deliver robust estimates. To the degree that estimates are not robust or statistically sound, we need to take that performance into account in terms of making a judgment as to the effectiveness of that particular method.

### 2.6.5 Market data and other information (criterion five)

In the consultation paper we proposed that where market data and other information is used, this information is:

(a) credible and verifiable

(b) comparable and timely

(c) clearly sourced.

The intention of proposing the above criterion was to ensure the empirical analysis and data supporting the estimation of the rate of return were employed in a sound manner.

The MEU stated its concern 'with the "market data" the AER proposes to use':[39]

> The listing of market data proposed to be used is unnecessary restrictive. For example, such an approach would exclude outcomes that are seen in the stock market.

We consider market data to include:

- data on prices, maturities and terms and conditions of government and non-government bonds, financial derivatives and other financial instruments

- data on equity prices and ratios such as price earnings ratios and RAB multiples

- data on financial structures such as gearing levels and credit ratings.

The term 'include' does not limit the consideration of data not listed above.

### 2.6.6 Have the flexibility to reflect changing market conditions (criterion six)

In the consultation paper we proposed that the allowed rate of return objective may be best met if the proposed rate of return methods are sufficiently flexible as to allow changing market conditions and new information to be reflected in regulatory outcomes, as appropriate.

The intent of this criterion is to recognise that estimation methods, data and other evidence are more likely to be relevant if they are responsive to changing market conditions. We consider this criterion would help to deliver the requirements of the NEL/NGL and the rules.

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[38] The new rules require the use of a weighted average cost of capital, but this is subject to the requirement that the weighted average must contribute to the allowed rate of return objective (NER, cls. 6.5.2(d) and 6A.6.2(d); NGR, r.87(4)).
[39] MEU, *Response to the consultation paper*, June 2013, p. 11.

The rules refer to the need to have regard to prevailing market conditions when estimating the return on equity.[40] However, what is intended in this criterion is that relevant estimation methods are capable of capturing the relevant changes in prevailing market conditions or changes that have occurred over historical periods. For example, a capable estimation method would be based on timely, available updates to data. Such capability could assist the method to meet the requirement for the return on equity to reflect prevailing conditions in the market.

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[40]    NER, cl.6.5.2(g) and cl. 6A.6.2(g) and NGR, r. 87(7).

# 3 Benchmark efficient entity and compensation for risk

This chapter outlines our proposed view on the 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 Issue

The allowed rate of return objective requires that we 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.[41]

The AEMC provided for the possibility of more than one benchmark if there was not a similar degree of risk between the benchmark efficient entity and the network service providers.[42]

In assessing whether more than one benchmark is required, we are required to consider the risk characteristics of regulated energy network service providers. Then we must assess whether the degree of risk exposure in providing regulated services is similar for the benchmark efficient entity and regulated energy network service providers.[43] This chapter outlines our considerations in making this assessment.

## 3.2 Proposed approach

Our proposed approach for defining the benchmark efficient entity is to:

- adopt a single benchmark across gas, electricity, transmission and distribution

- adopt a conceptual definition of the benchmark efficient entity that is 'a pure play, regulated energy network business operating within Australia'

Our proposed approach to the practical implementation of the definition of the benchmark efficient entity is discussed in chapter 5 (for equity) and chapter 6 (for debt).

## 3.3 Reasoning

In coming to our draft position on the definition of the benchmark efficient entity, we have considered:

- Reasons for defining a benchmark efficient entity

- Risks to be compensated through the rate of return

- Debt compensation in practice

- Reasons for the elements of the definition of the benchmark efficient entity

    - pure play

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[41]     NER, cls. 6.5.2(c), 6A.6.2(c); NGR, r. 87(2)(3).
[42]     AEMC, *Final rule change determination*, 29 November 2012, p. 67.
[43]     In electricity distribution regulated services refers to standard control services, in electricity transmission it refers to prescribed transmission services and for gas distribution and transmission it refers to reference services.

- regulated

- energy network

- operating within Australia

- Issues raised in submissions (see appendix B)

Each of these issues is discussed in turn below.

### 3.3.1 Reasons for defining a benchmark efficient entity

In estimating and setting the benchmark rate of return on capital, we are interested in measuring and setting an overall rate of return. While service providers' financing structure may vary, it is the overall required rate of return that is to be similar. The benchmark efficient entity is defined such that a similar overall rate of return should be able to be achieved by specific service providers.

In setting the overall rate of return we are concerned with setting a rate which provides service providers with a reasonable opportunity to recover at least their efficient financing costs, consistent with the NEO, NGO and RPP.[44] So long as service providers have this reasonable opportunity, we consider that it is not necessary to have numerous approaches which are tailored to the circumstances of individual service providers. This would be contrary to the principles of incentive regulation. It could also lead to service providers being compensated for inefficient practices. For example, if a service provider takes on more debt (i.e. has higher gearing) relative to the benchmark and incurs higher financing costs (i.e. a higher rate of return), this should not lead to higher compensation.

We consider that business specific risk factors brought about by a service provider choosing to deviate from the benchmark are not relevant to the benchmark. Service providers bear the upside and downside risk associated with deviating from the benchmark.

The benchmark efficient entity is a conceptual notion, rather than a real entity. The definitions of the benchmark efficient entity informs the weight the AER places on empirical evidence (e.g. for the equity beta, credit rating and gearing). The benchmark definition helps to establish the sample of data that can be employed to estimate efficient financing costs.

### 3.3.2 Risks to be compensated through the rate of return

We consider that the risks which are relevant for establishing the notion of the benchmark efficient entity, and in turn the regulatory rate of return for that benchmark efficient entity, are those risks for which an investor in an energy network business in Australia would require compensation. Not all risk is priced into an investor's required rate of return.

Risk is created where actual returns for a business vary from expected returns. Risk may be characterised as systematic or non-systematic (see figure 3.1) and as symmetrical or asymmetrical.

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[44]   NEL s. 7; NEL s. 7A; NGL s. 23; NGL s. 24.

**Figure 3.1    Risk type and compensation**
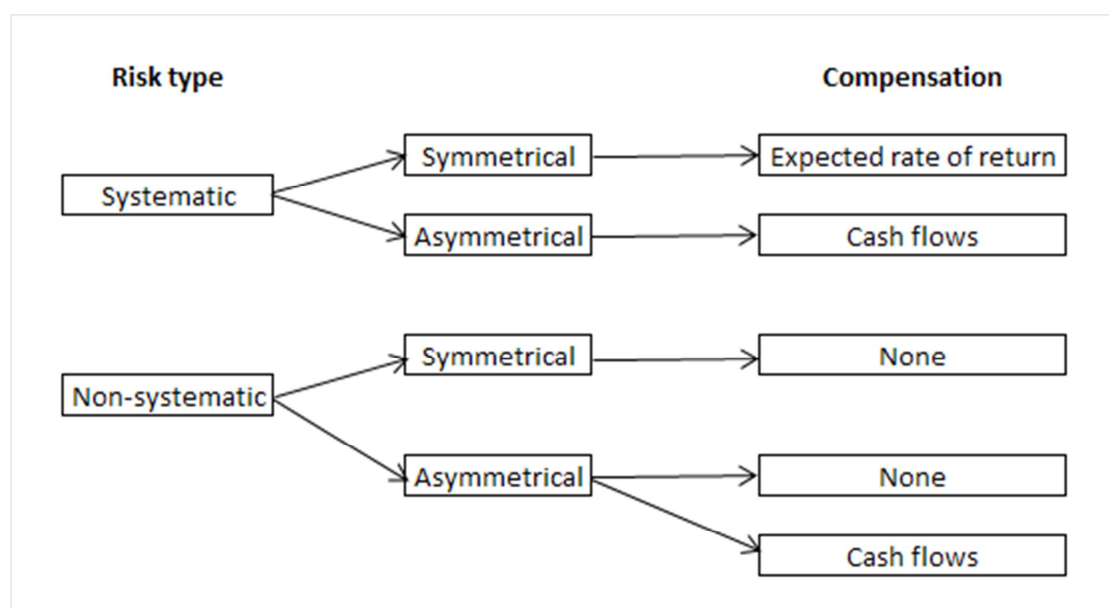


Source:    AER analysis.

Systematic risk (or non-diversifiable risk) is that component of total risk which is due to economy-wide factors.[45] Commonly, systematic risk is measured by the extent to which the returns to the business co-vary with general market returns.

We consider that compensation for systematic risk should be made via the expected rate of return (i.e. via the WACC). For example, covariance with movements in the broader economy will be non-diversifiable and are compensated via the expected rate of return. If the regulator sets the regulatory return correctly, this will equal the expected rate of return in the market.

Where risk is asymmetrical, we consider that compensation should generally be made via explicit adjustment of the cash flows. For example, if an investor expects a negative asymmetric cost, they will reduce the expected return accordingly. The regulator may adjust the cash flow up for the value of the negative expectation so that the expected rate of return equals the required rate of return (i.e. the expected rate of return under the asset pricing model). We consider that risks related to the type of end users / customers, the level of competition to which a business is exposed, and the form of regulatory control should generally be reflected in beta estimates and debt yields and therefore be adequately compensated through the regulatory WACC of the benchmark efficient entity.

Systematic risk is the only risk that enters into the estimation of return on equity under the assumption that investors hold fully diversified equity portfolios. This is because it is only non-diversifiable risk that equity investors cannot manage. For example under the CAPM, it is assumed that an investor is able to hold a diversified portfolio and the CAPM beta of the investment is the appropriate measure of the total systematic risk of the investment.

Non-systematic risk (or diversifiable risk) is that component of total risk which is firm or industry specific and may be eliminated by portfolio diversification.[46]

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[45]    Pierson, Graham, Rob Brown, Steve Easton and Peter Howard, *Business Finance*, 8th Edition, Sydney, p. 214.
[46]    Pierson, Graham, Rob Brown, Steve Easton and Peter Howard, *Business Finance*, 8th Edition, Sydney, p. 214.

Where non-systematic risk is symmetrical in nature we consider no compensation is required in the expected return. However, we note that these types of risks, to the extent that they cause an expectation of default on debt, will be reflected in the yield to maturity (YTM). We consider that in the instance where asymmetric risks offset each other, no further compensation for these risks should be required.

Both non-systematic and systematic risks may influence the yield on debt and the level of gearing that a business adopts. However, we consider that firms should be able to achieve the overall benchmark return, notwithstanding firm specific factors which may lead them to deviate from the benchmark. It is also worth noting that we use the YTM (i.e. promised yield on debt) to set the regulatory return on debt for the benchmark efficient entity. Therefore all risk priced by investors (whether systematic or not) and all asymmetric cash flow expectations facing the benchmark efficient entity should be appropriately compensated in relation to debt capital. For example, if investors price a given risk factor into a debt security's valuation, they will discount the cash flows on the debt security appropriately when valuing it, and this will be reflected in the yield to maturity on the debt security (as observed in the market). Likewise, to the extent investors expect the expected yield to be less than the promised yield, investors will discount the cash flows on the debt security appropriately for this expectation when valuing it, and this will be reflected in the yield to maturity on the debt security (as observed in the market).

We would stress that if a firm chooses to adopt practices that result in a higher risk profile, leading to a higher overall cost of capital (relative to the efficient benchmark), then the firm should not be compensated for those additional risks. In addition, while regulated firms are free to attempt to outperform the rate of return benchmark and are generally free to keep any gains they achieve relative to this benchmark, regulated firms must also bear any losses they suffer relative to the benchmark, where they deviate from it. This is consistent with the incentive based regulatory regime.

We also consider the degree to which the regulatory framework mitigates risk is highly material and should also be taken into account in setting any regulatory compensation. In order to understand the risks to which a regulated energy business may be exposed we have sought to identify the major risk categories faced by regulated businesses. We have considered the likely drivers of the particular risk, which may inform us of whether there is likely to be a difference between businesses. In particular, we have considered whether there are specific characteristics related to gas or electricity or transmission or distribution that might lead to materially different risk profiles. In view of the discussion above, we are also interested in whether these individual risks are likely to be systematic/non-systematic and symmetrical/asymmetrical. This will inform us as to whether the risk is likely to be compensated through the rate of return, lead to an adjustment of the cash flows or neither.

## Individual risks

We have considered the individual business and financial risk categories to which an energy business may be exposed (see table 3.1, table 3.2 and appendix B). While there are likely to be both systematic and non-systematic components to all of these risks, where we consider these risks are likely to be primarily systematic or non-systematic in nature we have classified them as such in the table below. We note that financial risks are caused by the way a firm finances its operations and are primarily driven by other underlying business risks. These risks are either compensated in the WACC, or through the cash flows, or do not require additional compensation as the risks are diversifiable. We also note that it is neither necessary nor practical to estimate and compensate these risks in isolation. Therefore, while we have identified the risk for the purposes of discussion of the different risks facing regulated energy firms, we consider systematic risk is likely to be measured under an equity pricing

model. This can then be used to estimate the required return on equity, and the required return on debt can be estimated from observable yields on debt.

**Table 3.1    Business risks to which regulated energy businesses may be exposed**

| Business risks | Sub-risk | Systematic/ non-systematic risks | Risk driver | Regulatory regime provisions which alter the risk |
|---|---|---|---|---|
| Demand risk | | Systematic  Non-systematic | Type of end user  Level of competition  Form of regulatory control | Form of control - Revenue cap, weighted average price cap[47]  Tariff structures  Delayed investment is able to be reapplied for in the next regulatory period.  Prudent and efficient cost over-runs rolled into the RAB in the next regulatory period.[48] For electricity service providers, this is subject to the capital expenditure sharing scheme and the opex efficiency benefit sharing scheme. [49]  Pass through provisions[50]  Contingent project provisions[51] |
| *Demand risk is the risk that actual future demand for a firm's output does not match forecast demand.* | | | | |
| Cost volume risk | | Systematic  Non-systematic | Type of end user  Type of project | Delayed investment is able to be reapplied for in next regulatory period.  Prudent and efficient cost over-runs rolled into the RAB in the next regulatory period.[52] For electricity service providers, this is subject to the capital expenditure |

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[47]    NER, cls. 6A.4.2 and 6.2.5(b), NGR, r. 97(2).
[48]    The draft capital expenditure guidelines provide for an ex-post review of capex (under NER, cls. S6.2.2A and S6A.2.2A). Inefficient capex above the allowance, related party margins and opex amounts reclassified as capex are able to be excluded from the regulatory asset base. Gas network service providers were already subject to an ex-post review of capex under NGR, r. 77(2)(b).
[49]    The draft capital expenditure guidelines provide for a capital expenditure sharing scheme (under NER, cls. 6.4A and 6A.5A). The AER is proposing to allow NSPs to retain 30 per cent of any underspend during the regulatory control period and make NSPs bear 30 per cent of any overspend (see AER, *Better Regulation: Draft Capital Expenditure Incentives Guidelines*, August 2013, p. 6).
The proposed opex efficiency benefit sharing scheme provides for an NSP to retain six years of benefits from an incremental efficiency gain in opex regardless of when the gain is made. Similarly, the NSP would incur the costs of an incremental efficiency loss in opex for six years regardless of when the loss is made. (under NER, cls. 6.5.8 and 6A.6.5) (see AER, *Electricity Network Service Providers: Proposed Efficiency Benefit Sharing Scheme*, August 2013, p. 5).
[50]    NER, cls. 6A.7.3, and 6.6.1, NGR, r. 97(1)(c).
[51]    NER, cls. 6A.8 and 6.6A.
[52]    The draft capital expenditure guidelines provide for an ex-post review of capex (under NER, cls. S6.2.2A and S6A.2.2A). Inefficient capex above the allowance, related party margins and opex amounts reclassified as capex are able to be excluded from the regulatory asset base. Gas network service providers were already subject to an ex-post review of capex under NGR, r. 77(2)(b).

| | | sharing scheme and the opex efficiency benefit sharing scheme. [53]<br><br>Pass through provisions<br><br>Contingent project provisions |

| *Cost volume risk is where there is uncertainty surrounding the quantity of inputs, or the time required to deliver a particular output.* | | |

| Supplier risk | Systematic<br><br>Non-systematic | |

| *Supplier risk is where third party suppliers of material or labour fail to deliver the goods or services agreed to.* | | |

| Inflation risk | Systematic | CPI-X regime, regulatory RAB is adjusted (rolled forward) using actual outturn inflation[54] |

| *Inflation risk is the risk of expected inflation varying from actual inflation. Inflation risk is a largely systematic risk.* | | |

| Input cost risk | Systematic | Prudent and efficient cost over-runs rolled into the RAB in the next regulatory period.[55] For electricity service providers, this is subject to the capital expenditure sharing scheme and the opex efficiency benefit sharing scheme.[56]<br><br>Pass through provisions<br><br>Re-opening provisions |

| *Input cost risk is where the forecast input cost (both volume and price) differs from the actual input cost for opex and capex.* | | |

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[53]  The draft capital expenditure guidelines provide for a capital expenditure sharing scheme (under NER, cls. 6.4A and 6A.5A). The AER is proposing to allow NSPs to retain 30 per cent of any underspend during the regulatory control period and make NSPs bear 30 per cent of any overspend (see AER, *Better Regulation: Draft Capital Expenditure Incentives Guidelines*, August 2013, p. 6).
The proposed opex efficiency benefit sharing scheme provides for an NSP to retain six years of benefits from an incremental efficiency gain in opex regardless of when the gain is made. Similarly, the NSP would incur the costs of an incremental efficiency loss in opex for six years regardless of when the loss is made. (under NER, cls. 6.5.8 and 6A.6.5) (see AER, Electricity Network Service Providers: Proposed Efficiency Benefit Sharing Scheme, August 2013, p. 5).

[54]  NER, cls. 6A.6.1(e)(3) and 6.5.1(e)(3).

[55]  The draft capital expenditure guidelines provide for an ex-post review of capex (under NER, cls. S6.2.2A and S6A.2.2A). Inefficient capex above the allowance, related party margins and opex amounts reclassified as capex are able to be excluded from the regulatory asset base. Gas network service providers were already subject to an ex-post review of capex under NGR, r. 77(2)(b).

[56]  The draft capital expenditure guidelines provide for a capital expenditure sharing scheme (under NER, cls. 6.4A and 6A.5A). The AER is proposing to allow NSPs to retain 30 per cent of any underspend during the regulatory control period and make NSPs bear 30 per cent of any overspend (see AER, *Better Regulation: Draft Capital Expenditure Incentives Guidelines*, August 2013, p. 6).
The proposed opex efficiency benefit sharing scheme provides for an NSP to retain six years of benefits from an incremental efficiency gain in opex regardless of when the gain is made. Similarly, the NSP would incur the costs of an incremental efficiency loss in opex for six years regardless of when the loss is made. (under NER, cls. 6.5.8 and 6A.6.5) (see AER, Electricity Network Service Providers: Proposed Efficiency Benefit Sharing Scheme, August 2013, p. 5).

| | | | | |
|---|---|---|---|---|
| *Input cost risk is considered largely systematic and a large component of it is likely to be driven by inflation risk.* | | | | |
| Competition risk | Stranding | Non-systematic | Type of end user<br><br>Level of competition | Prudent discounts[57]<br><br>Accelerated depreciation[58] |
| *Competition risk refers to the risk associated with new entry or expansion of existing rivals, or cross-sectoral competition.* | | | | |
| Political risk | | Systematic<br><br>Non-systematic | | Pass through provisions<br><br>Re-opening provisions[59]<br><br>Use of long term government bond yields to set the base return on equity with updated returns calculated each regulatory period. Use of trailing average, updated annually to estimate the cost of debt. |
| *Political risk is the variation in a firm's returns which is attributable to the decisions of a government.* | | | | |
| Regulatory risk | | Non-systematic | | NSPs participate in the rule making process<br><br>Relatively prescriptive rules<br><br>Legal review mechanisms |
| *Regulatory risk is the variation in a firm's returns which is attributable to the decisions of the rule making authorities (e.g. AEMC, state governments) or the regulator.* | | | | |
| Other business risks (e.g. credit risk, engineering and design risk, construction risk) | | Non-systematic | | Allowance for self-insurance costs<br><br>Pass through provisions |
| *May include low probability/high cost events (e.g. bushfires) or damage caused by third parties, which may have a large impact on the business' cash flows relative to movements in the market.* | | | | |

Source:   AER analysis. Classification of risks as between business and financial risk is based on Frontier Economics, *Assessing risk when determining the appropriate rate of return for regulated energy networks in Australia*, June 2013, p. 10.

**Table 3.2    Financial risks to which regulated energy businesses may be exposed**

| Financial risks | Sub-risk | Systematic/ non-systematic | Risk driver | Regulatory regime provisions which alter the risk |
|---|---|---|---|---|

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[57]   NER, cl. 6A.26; NGR, r. 96.
[58]   NER, cl. 6A.6.3(b)(1); NGR, r. 6.5.5(b)(1).
[59]   NER, cls. 6A.7.1 and 6.6.5.

| | risks | |
|---|---|---|
| Refinancing risk | Systematic<br><br>Non-systematic | Trailing average portfolio approach, which assumes a 'staggered portfolio' of maturities as a debt financing practice. |
| *Refinancing risk is the risk that when a business seeks to refinance its debt it cannot access all of its refinancing needs.* | | |
| Interest rate reset risk | Non-systematic | The regulatory return on debt is reset annually based on the actual cost of debt in the market. |
| *Interest rate reset risk is the risk that the allowed cost of debt does not match the business' actual cost of debt.* | | |
| Liquidity risk | Systematic<br><br>Non-systematic | Published determinations provide information to the market. |
| *Liquidity risk is the risk arising from investors' uncertainty over whether they will be able to trade a given asset at some point in the future.* | | |
| Default risk | Systematic<br><br>Non-systematic | |
| *Default risk is the risk that the cash flows generated by the business are insufficient to cover its debt obligations.* | | |
| Financial counterparty risk | Systematic<br><br>Non-systematic | |
| *Financial counter party risk is where third parties (e.g. banks, insurance firms) do not deliver on their obligations with the business.* | | |

Source:   AER analysis. Classification of risks as between business and financial risk is based on Frontier Economics, *Assessing risk when determining the appropriate rate of return for regulated energy networks in Australia*, June 2013, p. 10.

Network service providers have a mix of industrial, commercial and residential end users. These networks have the characteristics of a natural monopoly. Consequently they face limited competition, which is why they are regulated. Gas and electricity are an integral part of industrial, commercial and domestic processes. The amount of gas or electricity demanded is relatively insensitive to changes in either income or prices. The lack of competition and the relative necessity of electricity and gas lead to relatively stable revenue flows for network service providers compared with other businesses in the economy. Network service providers make large capital investments in long-lived assets.

The regulatory regime to which network service providers are subject is transparent and relatively stable over time. Rule changes are made independently of the regulator. The regulator is generally required to develop guidelines setting out how it will implement the rules. Network service providers provide input into both the rule change and guideline setting processes. Determination periods are generally five years with the forecast revenue requirements (and revenue cap or price cap prices)

updated for current expenditure forecasts, current demand figures and the current market based cost of capital. The building block method of calculating required revenue provides transparency and predictability. The form of control provides for revenues or prices to be stable over the determination period. There are provisions which enable the allowed revenue to be revised. These include contingent project, pass through, and re-opener provisions. The regulatory regime reduces the cash flow risks to which network service providers might otherwise be exposed.

Given the characteristics of network service providers and the regulatory regime we consider that network service providers are likely to face lower business risks relative to the broader market.

This view is supported by Frontier Economics, Kanangra and Australia Ratings:

▪ After considering the individual risks in table 3.1 and table 3.2, and the impact of the regulatory regime, Frontier Economics assessed that:[60]

> [e]nergy networks do face some business risks despite the absence of demand and supply-side threats and their slow rates of technological change. However, these risks tend to be smaller than the elemental risks that more technology-sensitive networks have faced in recent years and far less than most businesses in the economy. In addition, the regulatory framework helps ameliorate many of the risks by effectively transferring them to network users. This means that the exposure of energy networks to business risks is far less than non-network non-regulated businesses.

▪ Kanangra state that 'all rated NSPs have the same Business Risk Profile – Excellent' compared with '[m]ost industrial corporates in Australia [which] are characterised as having a Satisfactory Business Risk Profile' and that 'S&P regards the Business Risk Profile of NSPs as Excellent due to the supportive regulatory framework [and] predictable cash flow'.[61]

▪ Australia Ratings state that 'S&P currently assesses most Australian energy networks as having an 'excellent' business profile'.[62]

The low underlying business risk to which regulated energy businesses are exposed enables these businesses to increase their level of gearing. The level of gearing is bound by the need to maintain an investment grade credit rating, which enables the businesses to access a diverse range of capital markets. There is a degree of choice in how much financial risk businesses adopt. We will be informed by the overall level of risk (which includes business and financial risk) of an energy business relative to the market by empirical evidence. We are in the process of updating this empirical evidence (see appendix G).

Frontier Economics assesses that businesses are exposed to generally low to medium financial risk (see table 3.3). We consider that the input price risk, cost volume risk, refinancing and interest rate reset risk are overstated by Frontier Economics (see appendix B for a discussion of each of these risks).

**Table 3.3    Frontier Economics' assessment of materiality of risks faced by regulated energy networks in Australia, relative to other businesses in the economy**

| Business risks | Networks' exposures | Financial risks | Networks' exposures |
| --- | --- | --- | --- |

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[60]   Frontier Economics, *Assessing risk when determining the appropriate rate of return for regulated energy networks in Australia*, June 2013, p. 64.
[61]   Kanangra, *Credit Ratings for Regulated Energy Network Services Businesses*, June 2013, p. 14; Kanangra, *Credit Ratings for Regulated Energy Network Services Businesses*, June 2013, p. 18.
[62]   Australia Ratings, *Assessment of Implied Credit Rating Arising from the Australian Energy Regulator's Draft Decision on Access Arrangements for APA GasNet Australia (Operations) Pty Ltd for 2013-17*, November 2012, p. 18.

| | | | |
|---|---|---|---|
| Demand risk - investment | Low | Refinancing risk | Medium |
| Demand risk - volume | Low to medium (depending on the form of control) | Interest rate reset risk | Medium to high |
| Input price risk | Medium | Liquidity risk | Low (large networks)<br><br>Medium to high (small networks) |
| Cost volume risk | Low to medium | Default risk | Low |
| Supplier risk | Low | Financial counterparty risk | Low |
| Inflation risk | Low | | |
| Competition risk | Low | | |
| Stranding risk | Low | | |
| Political/regulatory risk | Low to medium | | |
| Other business risks | Low | | |

Source:    Frontier Economics, *Assessing risk when determining the appropriate rate of return for regulated energy networks in Australia*, June 2013, p. 65.

## Consideration of differences between gas and electricity service providers

There are two main areas where submissions have identified potential differences in the risk exposure of gas and electricity businesses. These areas are:

- Demand risk. Differences between the service providers' exposure to demand risk are driven by variations in the type of end user/customer, the level of competition faced by the business and the form of regulatory control to which the business is subject; and

- Competition risk, which encompasses the risk of asset stranding. Asset stranding is an extreme form of competition risk. Differences across businesses are driven by the type of end user/customer and the level of competition faced by the business.

With respect to demand risk we consider that:

- Generally there is more variation in the composition of the end users/customers across gas business than across electricity businesses.[63]

- Typically the load consumed by end users/customers of gas businesses is more concentrated in the industrial sectors than in the residential and commercial sectors. However, there is evidence that this pattern is not universal. For example, Multinet, a gas distributor, states that its 'top 250

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[63]    Bureau of Resource and Energy Economics, *2013 Australian energy statistics data*, Table F, <http://www.bree.gov.au/documents/publications/aes/data/2013/Table-F.xlsx> , accessed 23 July 2013; AER analysis.

gas users collectively account for only around 1 per cent of total distribution revenue. As a result, the potential for a negative impact on revenue from the loss of a major user is very low'.[64] In contrast, Transend, an electricity transmission business, states that almost half of its transmitted electricity is consumed by four industrial users and that '[d]emand for energy can change markedly as a result of commercial decisions made by these four customers'.[65]

Where there are fewer end users/ customers, the gas or electricity business is likely to be exposed to the risks facing the end user/ customer.

Overall we do not agree with the positions put to us by APIA, Envestra and APA Group.[66] We consider that the net risk exposure of the businesses we regulate, taking into account the risk and the mitigating impact of the regulatory regime, is sufficiently similar to warrant the use of only one benchmark. We have reached this view for the following reasons:

▪ The regulatory regime mitigates the differences in demand risk through the revenue or price setting mechanism (form of control). In particular, under a revenue cap, where forecast quantity demanded differs from actual quantity demanded, in subsequent years price adjustments are made to enable the approved revenue to be received by the service provider. Further, in most cases, a TNSP will determine prices based on historical demand which reduces intra year revenue variations. This effectively mitigates the risk associated with demand volatility. Electricity transmission service providers are required to use a revenue cap.[67] We have indicated a preference for revenue caps.[68]

▪ Under a price cap, service providers may mitigate the risk of forecast error by restructuring tariffs, such that higher fixed charges are set to offset demand volatility.

▪ Electricity distribution and gas service providers are able to propose the form of control - revenue cap, price cap, or any variation thereof- they employ.[69] Service providers would be expected to choose the form of control which maximises its shareholder wealth. If a service provider chooses a price cap over a revenue cap it implies that any expected increase in cash flows must outweigh any expected increase in risk (i.e. discount rate applied to the expected cash flows).

▪ With respect to competition risk, we consider that by virtue of being regulated, these service providers effectively face a very limited increase in risk due to competition.

We consider that material competition between gas and electricity is likely to arise where, from the end user's perspective, there is a:

▪ significant change in the relative price of gas and electricity which is viewed to be stable over the longer term

▪ change in the relative efficiency of end user industrial technology and household and commercial heating, lighting and appliance technology.

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[64]  Key investment attributes <http://www.duet.net.au/Asset-portfolio/Multinet-Gas.aspx> accessed 25 July 2013.
[65]  Transend, *Annual Report 2012*, pp. 9, 13.
[66]  Envestra, *Response to Consultation Paper: Rate of Return Guidelines*, 28 June 2013, p. 10; APIA, *Response to Issues Paper: The Australian Energy Regulator's development of Rate of Return Guidelines*, 20 February 2013, Schedule 3, p. 1; APA Group, *Submission responding to AER Rate of Return Guidelines Consultation Paper*, 21 June 2013, p. 5.
[67]  NER, cl. 6A.4.2(a)(1).
[68]  AER, *Discussion Paper: Matters relevant to the framework and approach, ACT and NSW DNSPs 2014–2019, Control mechanisms for standard control electricity distribution services in the ACT and NSW*, April 2012, p. 15.
[69]  NER, cl. 6.2.5(b), NGR, r. 97(2).

It is generally accepted that the demand for gas and electricity is relatively inelastic.[70] With reference to price and income elasticities respectively, this means that prices or incomes have to change quite significantly for the end user to change the quantity of gas or electricity that they demand. The inelasticity is likely to be driven by a number of factors, including:

- the high value businesses/ households place on the consumption of energy

- the marginal cost of gas and electricity relative to total business/ household costs is generally relatively small compared to income, and

- service providers/ households have invested in sunk production technologies/ household heating and other appliances which have reasonable longevity.

APIA submits that one of the reasons that gas service providers face greater risk than electricity service providers is that gas is exposed to greater competition.[71] However, we note that gas service providers can and do mitigate competition from other pipelines through long term contracts with pipeline customers. In particular, transmission service providers enter into contracts which underwrite their revenue requirements. Gas transmission service providers' contracts with the end users are typically long, between 10 to 15 years[72], and for the majority of the increased capacity[73], thereby assigning most of the risk to the end user.[74] Gas distribution service providers also often undertake pipeline extensions when they are underwritten by government or developer contributions.[75]

In addition, gas and electricity production technology is relatively mature and technological advances which are likely to have a meaningful impact on prices have been relatively slow to commercialise.[76]

The greatest area of development, in terms of contribution to electricity generation, is in the commercialisation of large scale renewables. We note that overall electricity use is projected to increase annually by 1.1 per cent in 2050. The proportion of generation attributable to renewables is projected to increase markedly. However, to provide stability to the system due to the increase in intermittent generation, there is also projected to be a significant increase in gas peaking load.[77]

The ENA submitted that distributed generation, including rooftop PV and combined heat and power plants, together with energy efficiency measures are expected to significantly reduce demand for electricity delivered via transmission and distribution businesses.[78] We note that rooftop PV generation is projected to account for a small amount of total electricity generation in 2050 (see figure 3.2).[79] We also note that while there is some displacement of growth in large scale generation

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[70]  Bureau of Resource and Energy Economics, *Gas Market Report 2012*, Canberra, May 2012, p. 47.
[71]  APIA, *Response to Issues Paper: The Australian Energy Regulator's development of Rate of Return Guidelines*, 20 February 2013, Schedule 3, p. 1.
[72]  Energy Quest, *ESAA Domestic Gas Study Stage 2*, 10 March 2011, p. 69.
[73]  Energy Quest, *ESAA Domestic Gas Study Stage 1*, 1 September 2010, p. 42.
[74]  For example, in October 2011 APA entered a 10 year contract with AGL to transport gas in its Carpentaria Gas Pipeline to Diamantina Power Station at Mount Isa. The power station is underpinned by 17-year energy supply agreements with Mount Isa Mines. APA Annual Report 2012, p. 7. Another example, is the Stage 3 expansion of Epic Energy's South West Queensland Pipeline is underpinned by transport agreements for over 90 per cent of the increased capacity with AGL Energy and Origin Energy until 2028 and 2034. Energy Quest, *ESAA Domestic Gas Study Stage 1*, 1 September 2010, p. 42.
[75]  For example, Victorian government contributions via the 'Energy to the Regions' program have enabled gas distribution expansion.
[76]  Bureau of Resource and Energy Economics, *Australian energy projections to 2049-50*, Canberra, December 2012, pp. 42–43.
[77]  BREE, *Australian Energy Projections to 2049-2050*, Canberra, December 2012, Table 11, p. 41.
[78]  ENA, *Response- Frontier Economics Report: Assessing risk when determining the appropriate rate of return for regulated energy networks in Australia*, 17 July 2013, pp. 6-7.
[79]  BREE, *Australian Energy Projections to 2049-2050*, Canberra, December 2012, Table 12, p. 45; AER analysis. The increase is driven by reductions in rooftop PV prices, increases in retail electricity prices and continuing government

towards small distributed generation (see figure 3.2), grid connection is still likely to be required for emergency and peak use, and for deriving feed–in revenue.[80] The change in use profile is able to be mirrored by the businesses via the tariff structures, moving towards a higher fixed cost based on connectivity and capacity and a lower consumption cost.[81] Furthermore, distributed solar PV generation is one of the factors reducing projected maximum demand.[82] While there is currently the view that this will not defer network investment, Bain & Co point to the potential opportunity.[83]

**Figure 3.2**  **AEMO' annual energy forecasts segments for the NEM**
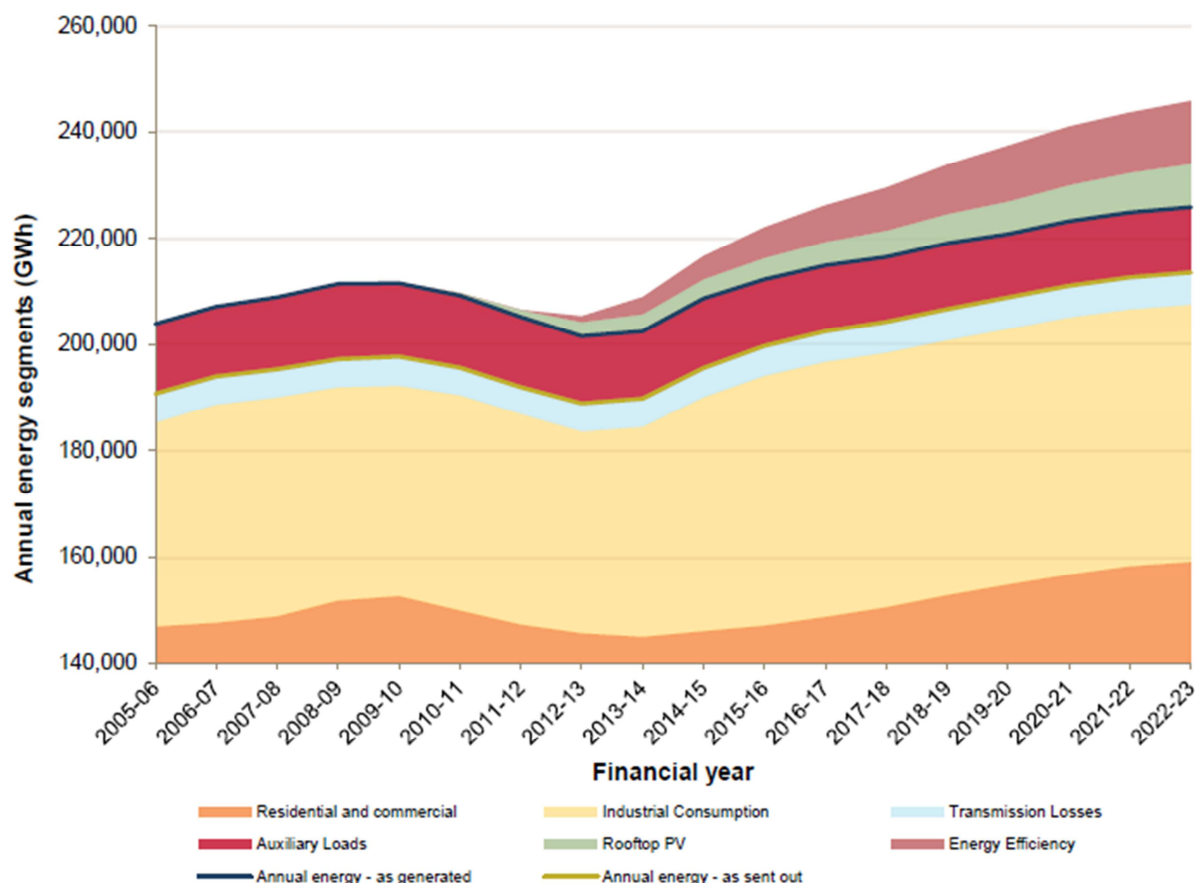


Source:    AEMO, National electricity forecasting report: For the National Electricity Market, June 2013, Figure 2-2, p.2-3.

We consider that, as a consequence of the inelasticity of demand and the slow technological change, changes in end user demand are generally likely to be small or business specific and to occur over a relatively lengthy period of time.

To the extent that there are genuine risks of extreme changes in demand for specific service providers which present the potential for stranding of an asset, the regulatory regime for gas and

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incentives, such as feed-in tariffs. In 2012 rooftop PV generation accounts for 1.2 per cent of total electricity generation. This is projected to increase to 5.3 per cent in 2050.
[80]   Bain & Company, *Distributed energy: Disrupting the utility business model*, 2013, p. 1.
[81]   Bain & Company, *Distributed energy: Disrupting the utility business model*, 2013, p. 1.
[82]   AEMO, *Rooftop PV Information paper: National Electricity Forecasting*, June 2012, p. 9.
[83]   BREE, *Australian Energy Projections to 2049-2050*, Canberra, December 2012, p. 45; Bain & Company, *Distributed energy: Disrupting the utility business model*, 2013, p. 3.

electricity can mitigate this risk by providing prudent discount[84] and accelerated depreciation[85] provisions.

On the basis of the evidence before it, we consider that there is limited risk associated with competition across and between gas and electricity service providers and the risks facing gas and electricity service providers are likely to be similar.

Australia Ratings shares this view, stating that the energy networks are essentially natural monopolies and would therefore score highly by Standard and Poor's due to the favourable competition environment.[86]

Given the assessment of the different components of risk set out above we consider that at a conceptual level regulated energy service providers face relatively similar risks but that these are significantly lower than the market average. Importantly, while we consider that there are sound theoretical reasons that gas transmission businesses may be somewhat riskier than the average energy distribution or transmission business, we consider the limited scope for competition between pipelines and regulatory regime largely mitigates this.

This view is shared by Frontier, which stated that:[87]

> there are some reasons to think that regulated gas transmission pipeline networks may be somewhat riskier than other types of regulated energy networks. …. However, this is not a strongly-held view, as aspects of the incentive regulatory arrangements provide more certainty to gas networks than electricity networks. Ultimately, the question of whether gas transmission pipeline networks are riskier than other types of energy networks needs to be answered empirically.

APIA and APA Group suggest the use of risk positioning, which 'trades off similarity for data availability in the formation of the benchmark efficient entity (BEE), and then, recognizing that the risks faced by the BEE are not necessarily very similar to those faced by the regulated firm, works through a formal process of adjusting the rate of return estimates from the BEE to match the risk profile faced by the service provider'.[88] We consider that this is not required as a strong conceptual case has not been made that there are dissimilar risks between gas and electricity network service providers.

A further consideration is that from an investor's perspective, a single benchmark provides greater investor certainty regarding the outcome of a determination.

Finally, from a first principles consideration we are also of the view that the risks that require compensation are sufficiently similar to warrant the use of a single benchmark between electricity, gas, transmission and distribution. This position is further supported in the practical approach we employ in estimating the level of compensation that is required. Specifically, there are insufficient empirical observations to allow us to robustly measure differences between the various sectors. Instead, we draw on a broad sample of regulated businesses to inform our parameter values. In places we also draw data points from a broader sample of companies that are likely to have similar profiles to the businesses we regulate. This means that we think it is difficult to measure the differences in a robust way between the sectors in any statistically meaningfully way.

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[84]   NER, cl. 6A.26. NGR, r. 96
[85]   NER, cls. 6.5.5(b)(1), 6A.6.3(b)(1), NGR, r.89(1).
[86]   Australia Ratings, *Assessment of Implied Credit Rating Arising from the Australian Energy Regulator's Draft Decision on Access Arrangements for APA GasNet Australia (Operations) Pty Ltd for 2013-17*, November 2012, p. 16.
[87]   Frontier Economics, *Assessing risk when determining the appropriate rate of return for regulated energy networks in Australia: A report for the AER*, June 2013, p. 5.
[88]   APA Group, *Submission responding to AER Rate of Return Guidelines Consultation Paper*, 21 June 2013, p. 5.

### 3.3.3 Debt compensation in practice

Debt compensation is currently based on a benchmark efficient entity—the entity has the benchmark risk and leverage of a regulated energy business operating in Australia. In estimating the return on debt we use the average yield to maturity (based conceptually on term at issue) of this benchmark efficient entity.

The yield to maturity (YTM) may include compensation for both systematic and non-systematic risk. To the extent we are operating under a pricing model that assumes investors only price systematic risk, the YTM will include compensation for the risk free rate, plus compensation for systematic risk, plus compensation for the expected loss due to default. While default risk is likely to be driven by both systematic and non-systematic risk, given we use the observed YTM, it does not matter what risk is priced in the market, or what pricing model investors use, as all priced risks and cash flow expectations should be fully reflected in the YTM. Therefore, if liquidity risk or other factors are priced in the debt markets they should be adequately compensated under the current approach to setting the return on debt.

We also note the YTM will include compensation for the expected losses due to default. Arguably, compensation for the expected losses associated with debt default may provide overcompensation as this is not part of the expected return on debt. Despite this potential for overcompensation, we consider that using the unadjusted benchmark YTM to set the WACC is appropriate given the undesirability of having the regulatory regime place excessive financial risk on regulated firms. However, as we use the unadjusted YTM (promised yield), this is another factor indicating the benchmark WACC should adequately compensate all regulated firms for their investors required returns.

### 3.3.4 Reasons for elements of the definition of the benchmark efficient entity

We propose to define the benchmark efficient entity as 'a pure play, regulated network energy business operating within Australia'.

We consider that the definition of the benchmark efficient entity should assist us to determine a rate of return which:

- is consistent with setting an efficient rate of return for each of the regulated businesses

- is easily quantifiable

- promotes, or is consistent with, efficient organisational and ownership structures.

Our reasoning for each component of the proposed definition is discussed below.

#### Pure play

A pure play business is one which offers services focused in one industry or product area. In this context, it means that the benchmark efficient entity provides only regulated energy network services.

We consider that the benchmark efficient entity should be a pure play business as a business that offers services which are not related to regulated energy network services is likely to have a different risk profile.

## Regulated

A regulated entity for the purposes of our benchmark is one which is subject to economic regulation (i.e. revenue price cap regulation) under the National Electricity Rules and/or the National Gas Rules.

We consider that the benchmark efficient entity should be a regulated entity as:

- The rules require that the risks associated with the provision of regulated services are considered in determining the required rate of return.[89] As regulated services are delivered by regulated entities, it is logically consistent to consider the benchmark efficient entity as a regulated entity.

- Regulated service providers are typically not exposed to competition from other firms (in the case of distribution and some transmission businesses) or exposed to limited competition (in the case of regulated transmission businesses). The limited competition may alter the relevant (systematic) risk profile when compared with an unregulated firm.

- Regulated service providers are able to earn more stable cash flows relative to most unregulated businesses. These cash flows are regularly updated at resets to reflect required revenue (including changes due to shifts in demand and expenditure drivers) and therefore have similar business risks. Regulated service providers are also provided with some protection to their cash flows during regulatory control periods (e.g. pass through provisions and reopeners).

- Regulated service providers may align their business practices to the regulatory regime. This may lead to a different risk exposure than that faced by an unregulated firm.

## Energy network business

'Energy network' refers to a gas distribution, gas transmission, electricity distribution or electricity transmission business.

We consider that the benchmark efficient entity should be a regulated energy network business as:

- The NER and NGR refer to the regulation of energy transmission and distribution

- Different sectors of the economy are expected to have different characteristics which will lead to different risk profiles. By limiting the benchmark to energy network businesses we are limiting the possibility that risks will be dissimilar due to sectoral differences.

Implicit in the adoption of 'energy business' in the proposed definition of the benchmark efficient entity is that there is a single benchmark for gas distribution, gas transmission, electricity distribution and electricity transmission. We consider that the evidence available does not suggest that the risks are likely to be sufficiently dissimilar between gas distribution, gas transmission, electricity distribution and electricity transmission to justify more than one benchmark (see section 3.3.2).

## Operating within Australia

We consider that the benchmark efficient entity should be operating within Australia as the location of a business determines the conditions under which the business operates. This includes the regulatory regime, tax laws, industry structure and broader economic environment. As most of these conditions

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[89]    NER, cls. 6.5.2(c), 6A.6.2.(c); NGR, r.87(2)(3).

will be different from those prevailing for overseas entities, the risk profile of overseas entities is likely to differ from those within Australia.

Including 'operating within Australia' in the definition may also have implications for the choice of model used to estimate the return on equity. We consider an Australian domestic asset pricing model (e.g. a domestic CAPM) is consistent with this definition. This assumption is important for estimating the market risk premium, equity beta and gamma value.

The geographical market in which a comparator business operates is a determinant of investment risk. Australian service providers operate under similar tax laws, industry structure, and broader economic conditions. At least some of these factors are likely to differ for international comparators. The geographical specification of the benchmark may also influence the form of the equity pricing model that is applied and effects the estimation of the parameters into that model. For example under the current benchmark definition, we could adopt a domestic Australian equity pricing model that recognises the presence of foreign investors to the extent that they invest in Australian domestic financial markets. Alternative equity pricing model specifications include a 'fully-segmented' domestic pricing model or a 'fully-integrated' international pricing model.

## Other issues

We considered some additional elements that could be added to the benchmark. These are discussed in the following section. However, we have come to the view that these additional elements should not be included in the benchmark.

### *Ownership structure*

We have reviewed our previous benchmark definition which included "without parent ownership".

This review was motivated by the practical observation that over time the ownership of regulated assets has evolved towards a conglomerate structure. Today all regulated energy entities in Australia have parent ownership. Furthermore, there is evidence that credit rating agencies consider the parent ownership in assessing ratings. Parent ownership presents a different risk profile to an assumption of no parent ownership. An example of this is where the parent is able to influence negotiations to secure good terms, which results in a material decrease in the network entity's refinancing risk.[90]

The review was also motivated by a conceptual view that businesses may access a lower cost of debt via a parent or group structure, where the parent or group is able to:

▪ realise scale economies in issuing debt

▪ gain access to markets, where the minimum issuance size would be prohibitive for the individual entity[91]

▪ internally hedge, which can reduce transaction costs and smooth debt raisings, and increase the regularity of debt raisings, which can reduce transaction costs and improve investor appetite for debt issuances.[92]

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[90] Moody's Investor Service, *Credit Focus, SP AusNet, SPI (Australia Assets) Pty Ltd and Jemena Limited: Frequently Asked Questions*, 22 May 2013.

[91] ENA states that whether or not an entity has a parent may affect the nature and size of equity capital raising. ENA, *Response to the consultation paper*, June 2013, p. 104.

Frontier suggests that 'viewing the regulated network strictly as a standalone entity may lead the regulator to determine an allowed rate of return in excess of the business's efficient funding costs … by apply[ing] a small company premium, or allow[ing] larger capital issuance costs, than would be the case if the synergies associated with group ownership were recognised'.[93]

Parent ownership should not change the required return of investors in the regulated business. This is because the required return associated with the systematic risk of the regulated business will not change because of parent ownership. However, to the extent that the parent is a regulated energy business operating in Australia, its systematic risk level should be the same as its subsidiary, under the assumption that all regulated energy businesses in Australia face similar levels of risk.

In coming to a decision on whether to specify ownership as a characteristic of the benchmark efficient entity, we considered whether there is a particular ownership structure which promotes, or is consistent with, efficient financing and investment decisions for the regulated energy benchmark business. However, we consider that businesses with government owned parents should not be included in the definition.

Some user groups submitted that a government is able to access lower cost of debt due to its opportunity to access greater diversification of risk than is available to privately owned businesses. It may also be argued that the lower cost of capital is a result of the taxing powers available to the state, which provide reasonably unlimited credit insurance to the government.[94] Klein submits that if taxpayers were compensated for the risk they assume for tax-financed projects, then no capital cost advantage would be conferred upon government finance. The risk premium on government finance would, in principle, be no different to that of private investors.[95]

We consider that it is not possible to specify a particular ownership structure which is "efficient" and so propose not to take a view on ownership structure in the definition of the benchmark efficient entity.

Overall, we consider that, consistent with financing principles, the rate of return should be based on the non-diversifiable or systematic risks of the assets (i.e. regulated energy business) and not on the overall risk of the parent (as discussed above). This view was also adopted by the Productivity Commission[96], which further commented that 'applying a lower regulated WACC for state-owned rather than private businesses [is] not practically feasible or desirable'.[97]

Finally, we consider that firms either with or without parent ownership can be used for estimating the return on capital. As noted above, as long as the risk of the parent is likely to be consistent with the risk of the regulated business, the estimated required return of investors in the parent should reflect the required return of investors in the regulated business.

***Size of the entity***

The proposed benchmark definition does not propose a different benchmark according to the size of the entity.

[92]  Frontier, *Assessing risk when determining the appropriate rate of return for regulated energy networks in Australia: A report prepared for the AER*, June 2013, pp. 39-41.

[93]  Frontier, *Assessing risk when determining the appropriate rate of return for regulated energy networks in Australia: A report prepared for the AER*, June 2013, p. 41.

[94]  Klein, Michael, *The risk premium for evaluating public projects*, Oxford Review of Economic Policy, Vol. 13, No. 4, pp. 29-42.

[95]  Klein, Michael, *The risk premium for evaluating public projects*, Oxford Review of Economic Policy, Vol. 13, No. 4, pp. 29-42.

[96]  Productivity Commission 2013, *Electricity Network Regulatory Frameworks, Report No. 62*, Canberra, pp. 29, 215, 217.

[97]  Productivity Commission 2013, *Electricity Network Regulatory Frameworks, Report No. 62*, Canberra, p. 270.

We consider that the size of the network business is a function of ownership choice, not an immutable characteristic of the network entity.

Except for isolated networks, networks are interconnected local monopolies. In general, there are no natural boundaries between these networks. What is a small network now could become a large network through aggregation and vice versa – as we have seen through the various amalgamations of network businesses in NSW. There are no, or few, technical limits to aggregation or consolidation.

In theory the efficient size of a service provider will be a function of economies (or diseconomies) of scale. For energy networks, if there are economies of scale these may arise through, for example, shared corporate overheads and purchasing economies.

The implication is that the size of network service providers is a function of ownership and capital market decisions rather than inherent technical characteristics of networks. If the small size of a network creates a financial risk (e.g. debt raising) that is not offset by benefits in other costs, then this reflects an inefficient ownership structure. The inefficient ownership structure could be reduced or eliminated through a change in ownership. This is therefore not a risk that should be rewarded through the rate of return.

Furthermore, we do not consider there is clear evidence of a statistically significant relationship between firm size and the premium required to compensate investors for risk in Australia (see appendix E). Studies on whether a size premium exists in Australia are mixed. Frontier found four studies testing the Fama–French three factor model which report large positive size premiums and three studies reporting negative size premiums (see table 3.4). Frontier stated that the study which was the most comprehensive, in terms of the number of years of data and the number of companies covered, reported no statistically significant evidence for a size premium.[98]

**Table 3.4    Summary of Australian evidence on the Fama–French size premium**

| Study | Period | Average size premium (per cent pa) | Statistical significance |
|---|---|---|---|
| Halliwell et al (1999) | 1980-1991 | 6 | Not stated |
| Faff (2001) | 1991-1999 | –3.7 | Not stated |
| Faff (2004) | 1996-1999 | –6.1 | Not stated |
| Chan and Faff (2005) | 1990-1998 | 23.3 | Yes |
| Gharghori et al (2007) | 1996-2004 | 18.6 | Yes |
| Kassimatis (2008) | 1993-2005 | 11.5 | Yes |
| Brailsford et al (2012) | 1982-2006 | –2.6 | No |

Source:   Frontier Economics, *Assessing risk when determining the appropriate rate of return for regulated energy networks in Australia, A discussion paper prepared for the AER*, May 2013, p.29.

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[98]   Frontier Economics, *Assessing risk when determining the appropriate rate of return for regulated energy networks in Australia, A discussion paper prepared for the AER*, May 2013, p. 30.

However, we also note that systematic risk is not diversified through businesses merging to form larger businesses. Further, in relation to any liquidity risk, this risk is likely to be low. Accordingly, any size related issues related to any liquidity risk is also likely to be low. As such, we do not consider that additional explicit compensation for any of the regulated energy businesses in Australia is required.

As we allow equity and debt raising costs based on the size of the entity, all regulated businesses should be adequately compensated for their cost of capital irrespective of their scale.

# 4 Overall rate of return

Under the rules, the allowed rate of return must be determined such that it achieves the allowed rate of return objective.[99] This chapter, therefore, focuses on the determination of the rate of return using the nominal vanilla WACC formula. This includes the consideration of the term of the allowed rate of return, and the role of reasonableness checks. This chapter also considers the use of point estimates and ranges for the determination of the return on equity and the return on debt, as well as for the determination of individual parameter estimates.

Several of the issues relevant to the overall rate of return, however, are also relevant to both the return on debt and the return on equity.[100] Accordingly, the primary discussion of these issues is included in the corresponding return on debt and return on equity chapters and appendices.

## 4.1 Background

In our consultation paper, the overall rate of return chapter focused on a range of options for estimating the rate of return. In particular, we outlined a range of considerations germane to the overall rate of return. These considerations included:

- Our proposed use of the nominal post tax framework.

- Our proposed use of the WACC formula. This included the use of ranges, point estimates, and point estimates from within ranges for the overall rate of return, return on equity, return on debt, input parameter and evidentiary levels.

- Our proposed use of reasonableness checks on the overall rate of return.

- The term of the WACC.

As noted above, however, several of these considerations are relevant to both the return on debt and the return on equity. Engagement with stakeholders on these issues, therefore, has primarily been undertaken within the context of specific return on debt and equity discussions.

## 4.2 Proposed approach

Our proposed approach to determining an allowed rate of return that achieves the allowed rate of return objective includes the following characteristics:

- it estimates the rate of return on a nominal vanilla basis, as a weighted average of the point estimates of the return on debt and the return on equity[101]

- the weight given to the respective point estimates of the return on debt and the return on equity is based on our gearing ratio

- the term of our estimate of the return on debt is seven years, whereas our estimate of the return on equity is based on a 10 year term

- our estimate of the rate of return will be updated annually[102]

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[99]    NER, cl. 6.5.2(b), and 6A.6.2(b); NGR, r. 87(2).
[100]   For example, the term of estimates of the return on debt and return on equity, the use of ranges and point estimates, and the role of reasonableness checks.
[101]   NER, cl. 6.5.2(d), and 6A.6.2(d); NGR, r. 87(4).

- it uses RAB acquisition and trading multiples as reasonableness checks on the overall rate of return.

## 4.3 Reasoning

This section provides the reasoning for our proposed approach, and discusses the context in which it was developed.

### 4.3.1 Nominal post–tax framework and the form of the WACC

The rules prescribe that we must use a nominal post–tax framework to determine building block revenues.[103] A further explanation of what the application of a nominal post–tax framework means is provided in our consultation paper, and as such, is not repeated here.[104]

The rules also require that we estimate the overall rate of return on a nominal vanilla basis, as a weighted average of point estimates of the return on debt and the return on equity. For the reasons outlined in our consultation paper, we consider this approach will lead to transparent and robust outcomes.[105]

### 4.3.2 Intra–period adjustments

Our current approach is to estimate the rate of return at the start of the regulatory control period, and apply this rate of return over the whole regulatory control period (usually five years). This estimate is based on prevailing conditions in the market for funds at the commencement of the regulatory control period.

The current rules, however, allow annual adjustments to be applied to the return on debt (if the regulator decides such an approach is appropriate).[106] This requires the formula for calculating the updated return on debt to be specified in the regulatory determination. Moreover, this formula must be capable of being applied automatically. As discussed in greater detail in chapter 6, our approach to estimating the return on debt includes annual updates. Accordingly, our rate of return estimate will also be updated annually.

### 4.3.3 Point estimates, ranges, and point estimates from within ranges

The return on capital building block—which is used to determine a service provider's revenue allowance—is calculated as the product of the rate of return and the value of the capital base. We propose, therefore, to determine a single point estimate of the rate of return. Moreover, consistent with the reasons outlined in our consultation paper, we propose to determine a single point estimate of the return on equity and the return on debt.[107]

In our consultation paper we also discussed the use of ranges, point estimates, and point estimates from within ranges at the input parameter and evidentiary level. These issues are considered in greater detail in appendix G.

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[102] This is because our estimate of the return on debt will be updated annually. In contrast, we will estimate the return on equity at the start of the regulatory control period, and apply this estimate for the duration of the regulatory control period.

[103] NER, cl. 6.5.2(d)(2) and 6A.6.2(d)(2); NGR, r. 87(2)(b).

[104] For example, see section 3.4 of our consultation paper. AER, *Better Regulation: Rate of Return Guidelines: Consultation paper*, May 2013, pp. 24–25.

[105] AER, *Better Regulation: Rate of Return Guidelines: Consultation paper*, May 2013, pp. 25–26.

[106] NER, cl. 6.5.2(l), and 6A.6.2(l); NGR, r. 87(12).

[107] For clarity, our point estimate for the return on equity will be selected from a range for the return on equity. Our estimate of the range and point estimate from within that range will have regard to a broad range of information, and regulatory judgement. AER, *Better Regulation: Rate of Return Guidelines: Consultation paper*, May 2013, p. 25.

For clarity, table 4.1 outlines the levels at which we propose to adopt point estimates, ranges, and/or point estimates from within a range.

**Table 4.1        Estimation approach at different levels of the rate of return**

| Level of estimate | Approach |
|---|---|
| Overall rate of return | We propose to determine a point estimate of the overall rate of return using the nominal vanilla WACC formula. This estimate will be updated annually, to reflect the annual update to the return on debt (as discussed in chapter 6). |
| Return on debt | As discussed in chapter 6, we propose to determine a point estimate for the return on debt. This estimate will be updated annually. |
| Return on equity | As discussed in chapter 5, we propose to determine a single point estimate of the return on equity (from within a range). This estimate will be determined at the time of a determination, and apply for the duration of the regulatory control period. |
| Input parameters | As discussed in appendix G, we propose to determine a single point estimate from within a range for the equity beta and MRP. Alternatively, we propose to determine a single point estimate for the risk free rate. |
| Evidentiary level | At the evidentiary level, we propose to determine point estimates, ranges, and point estimates from within ranges. These estimates are considered in greater detail in appendix G. |

Source:    AER analysis.

### 4.3.4    Use of reasonableness checks at the overall rate of return

Our proposed approach to estimating the return on debt adopts a trailing average that is updated annually. Alternatively, our proposed estimation of the return on equity will be determined at the time of a determination, and apply for the duration of the regulatory control period. A key outcome of our proposed approach, therefore, is that our estimate of the rate of return may not be directly comparable to estimates from other regulators or market practitioners. Accordingly, we propose to not consider brokers' or other regulators' estimates of the overall rate of return. We will, however, consider any relevant information at the return on equity level (as discussed in chapter 5 and appendix F).

Alternatively, RAB acquisition and trading multiples may provide a broader indication of whether our estimates of the overall rate of return are above or below those required by investors. As such, they may be less afflicted by the comparability issues that arise with brokers' and other regulators' estimates of the overall rate of return. Moreover, RAB acquisition and trading multiples are well established tools used by equity analysts to compare allowed and actual returns on capital.[108] In this context, we consider the extent to which these multiples significantly and persistently differ from unity may be informative of the reasonableness of our overall rate of return estimates over time.

RAB acquisition and trading multiples, however, have a number of limitations. These limitations have been widely acknowledged.[109] Notably, factors other than the allowed rate of return may influence the level of RAB acquisition and trading multiples. Additionally, RAB acquisition multiples are typically infrequent, whereas trading multiples may reflect the unregulated operations of the service provider.

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[108]    See, for example: CEPA, *Australian energy regulator: Victorian gas networks market evidence paper*, February 2013, p. 51; Deloitte, *Determining the fair value of Australia's water infrastructure assets*, March 2010, p. 11.
[109]    See, for example: AER, *Better Regulation: Rate of Return Guidelines: Consultation paper*, May 2013, pp. 77–80.

On balance, we propose to continue using RAB acquisition and trading multiples to provide reasonableness checks on the overall rate of return. This is consistent with our view that drawing on a broader range of material may lead to estimates of the return on equity that best reflect efficient financing costs. As demonstrated in tables 4.2, 4.3 and 4.4, we consider that the level of RAB acquisition and trading multiples across previous determinations has supported the reasonableness of our rate of return estimates.

**Table 4.2        Selected acquisitions—RAB multiples**

| Date | Acquirer | Entity or asset acquired | RAB multiple (times) |
|------|----------|--------------------------|----------------------|
| Dec 2012 | State Grid Corp of China | ElectraNet SA (41 per cent) | 1.29 |
| Dec 2011 | Marubeni Corp/RREEF | Allgas | 1.20 |
| Dec 2011 | Marubeni Corp/RREEF | Allgas | 1.02 |
| July 2011 | ATCO | West Australian Gas Networks (26 per cent) | 1.20 |
| July 2011 | DUET | Multinet Gas (20 per cent) | 1.13 |
| July 2011 | DUET | Dampier to Bunbury Natural Gas Pipeline (20 per cent) | 0.95 |

Notes:     Dampier to Bunbury Natural Gas Pipeline (DBNGP) presents an unusual case because it is 96 per cent contracted until 2016 under shipper contracts. As the Economic Regulation Authority (ERA) of Western Australia states, these contracts 'are substantially independent of the access terms and reference tariffs established under the access arrangement for the DBNGP.' ERA, Final decision: DBNGP access arrangement, October 2011, p. 14.
Source:    AER, Final decision: SPI Networks (Gas) Pty Ltd access arrangement, Part 3: Appendices, March 2013, p. 60.

**Table 4.3        JP Morgan trading multiples**

| Date of report | Company | 2010–11 | 2011–12 | 2012–13 |
|----------------|---------|---------|---------|---------|
| 16 January 2013 | DUET | 1.26 | 1.18 | 1.20 |
| 16 January 2013 | ENV | 1.20 | 1.25 | 1.29 |
| 16 January 2013 | SKI | 1.26 | 1.22 | 1.27 |
| 16 January 2013 | SPN | 1.21 | 1.20 | 1.24 |

Source:    JP Morgan, Utilities 2013 Outlook: Regulatory Risks Recede, 16 January 2013, pp. 54, 58, 61, 64.

**Table 4.4        Credit Suisse trading multiples**

| Date of report | Company | 2012 | 2013 |
|----------------|---------|------|------|
| 12 February 2013 | DUET | 1.15 | 1.19 |
| 12 February 2013 | ENV | 1.35 | 1.43 |

| | | | |
|---|---|---|---|
| 12 February 2013 | SKI | 1.39 | 1.39 |
| 12 February 2013 | SPN | 1.14 | 1.18 |

Source:    Credit Suisse, Regulated Utilities Monthly, Sector review, 12 February 2013, p. 10; Credit Suisse, Regulated Utilities
              Monthly, Sector review, 7 November 2012, p. 14.

### 4.3.5   Term of the WACC

The rules require us to have regard to the desirability of using an approach that leads to the consistent application of any estimates of financial parameters.[110] The rules, however, do not mandate a consistent term across the return on equity and return on debt. Rather, the rules enable us to consider whether a consistent term for both the return on equity and the return on debt is appropriate.

For the reasons discussed in appendix D, therefore, we have proposed a 10 year term for the return on equity. These reasons include the long–term nature of cash flows in equity investment, in general, and the long–lived nature of the assets of service providers. Alternatively, for the reasons discussed in chapter 7, we have proposed a seven year term for the return on debt. The reasons for this term reflect the consideration of service providers' debt portfolios.

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[110]    NER, cl. 6.5.2(e)(2) and 6A.6.2(e)(2); NGR, r. 87(5).

# 5 Return on equity

To determine the allowed rate of return, the rules require that we have regard to relevant estimation methods, financial models, market data and other evidence.[111] For the purpose of estimating the return on equity, this involves the consideration of a number of alternative models and information sources. The rules also require the rate of return guideline set out:[112]

- the methods we propose to use in estimating the allowed rate of return, including how those methods are proposed to result in the determination of a return on equity that is consistent with the allowed rate of return objective

- the estimation methods, financial models, market data and other evidence we propose to take into account in estimating the return on equity.

A key question for the guideline, therefore, is how to distil a range of information into a point estimate of the return on equity.[113] This chapter outlines our proposed approach, and the reasons for this approach. This chapter also refers to a number of appendices linked to the estimation of the return on equity. For clarity, these include:

- Appendix D discusses the term of the return on equity.

- Appendix E assesses relevant models against our criteria.

- Appendix F assesses other material against our criteria, and discusses the role of relevant material.

- Appendix G discusses our approach to estimating the Sharpe–Lintner CAPM input parameters.

- Appendix H discusses the dividend growth model in greater detail.

## 5.1 Background

In our consultation paper, we provided an overview of a range of models and information sources that may inform our estimate of the return on equity. This overview included an explanation of each model or information source, and a summary of any views on specific models expressed by us or stakeholders (in previous determination processes, or in submissions to our issues paper). An appendix discussing the estimation of input parameters for the Sharpe–Lintner CAPM was also included.

Further, our consultation paper outlined four broad approaches for estimating the return on equity.[114] These approaches differed, for example, in how relevant material was incorporated in the estimation of the return on equity.

Following the consultation paper, we held a workshop to discuss our preliminary assessment of various return on equity models. We also met with stakeholders to discuss our proposed approach for estimating the return on equity for the benchmark efficient entity. The views expressed in this workshop, in addition to written submissions from stakeholders, informed our assessment of these

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[111]    NER, cl 6.5.2(e)(1) and 6A.6.2(e)(1); NGR, r. 87(5).
[112]    NER, cl 6.5.2(n) and 6A.6.2(n); NGR, r. 87(14).
[113]    In our consultation paper we stated that we would determine a single point estimate for the return on equity before estimating the rate of return.
[114]    These approaches included; primary model without reasonableness checks; primary model with reasonableness checks; several primary models with simple, quantitative weights; multiple models and other information.

models against our criteria. Similarly, the discussions held with stakeholders informed our proposed approach. These issues are discussed in greater detail in this chapter, and the aforementioned appendices.

## 5.2 Proposed approach

Our proposed approach to determining a point estimate for the return on equity includes the following characteristics:

- It has regard to a broad range of relevant material.

- Relevant material that may inform our estimate of the return on equity will be assessed against our criteria. This assessment will be used in determining the role of relevant material in estimating the return on equity.

- The Sharpe–Lintner CAPM will be used informatively, rather than determinately, to provide the starting point estimate and range for the final return on equity.

- Input parameter estimates for the Sharpe–Lintner CAPM will be informed by the Black CAPM and dividend growth model estimates. These parameter estimates will also have regard to other theoretical and empirical evidence.

- Regard will also be had to other information to determine the final return on equity point estimate, from within the range set by the Sharpe–Lintner CAPM. This includes an alternative implementation of the Sharpe–Lintner CAPM recommended by Professor Wright, and estimates of the return on equity from valuation reports, brokers and other regulators.[115]

- Given the uncertainty inherent in estimating equity returns, the final return on equity estimate will reflect either the foundation model point estimate, or an alternative value that is a multiple of 25 basis points.[116]

A flowchart outlining our proposed approach is provided in figure 5.1. The implementation of this approach, and the reasoning underlying these steps, is discussed in greater detail in this chapter and in appendix F.

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[115] During the Victorian gas access arrangement review, the Victorian gas service providers commissioned a report from Professor Stephen Wright. In this report, Professor Wright proposed an alternative implementation of the Sharpe–LintNER, CAPM for estimating the return on equity for the benchmark firm. See: Professor Stephen Wright, *Response to Professor Lally's analysis*, November 2012.

[116] If the foundation model estimate is used, this estimate will be rounded to a single decimal point.

**Figure 5.1      Flowchart of proposed approach to estimating the return on equity**
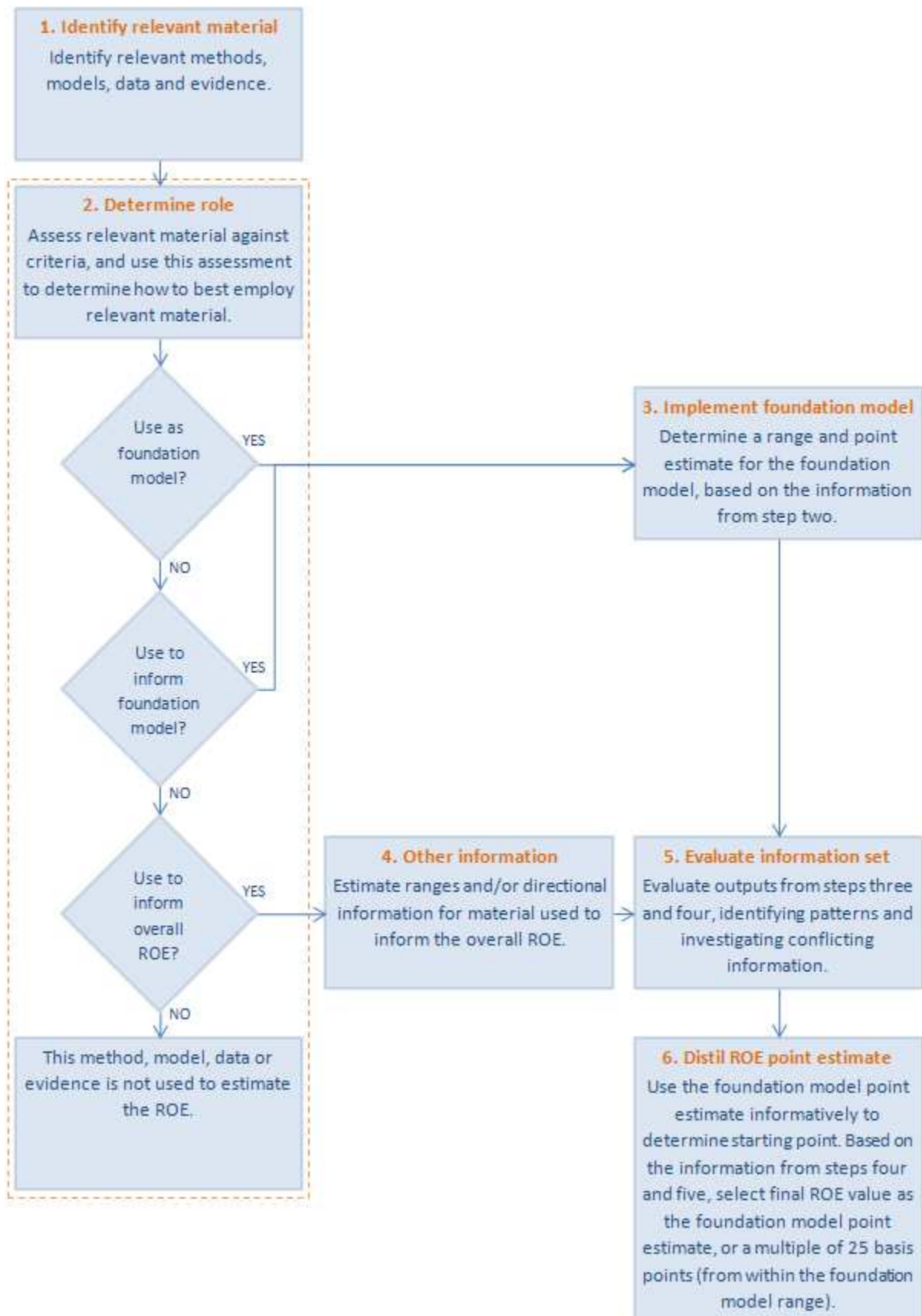


Source:     AER analysis.

## 5.3    Detail of proposed approach

To determine an estimate of the return on equity that is consistent with the allowed rate of return objective, we have proposed an approach based on a single foundation model. As summarised in section 5.2, this approach also draws on information and estimates from other relevant material. The reasoning for adopting a foundation model approach is discussed in section 5.4.

Our proposed approach represents a departure from the process undertaken during recent determinations. However, this approach is a result of the ongoing consultation for the development of this guideline. In particular, it draws on aspects of the four alternative approaches outlined in our consultation paper, as well as submissions from stakeholders. These alternative approaches, including those that combine direct estimates of multiple models (as proposed by both the ENA and APIA), are discussed in section 5.4.3.

### 5.3.1    Step one: identify relevant material

The rules require that we have regard to all relevant estimation methods, financial models, market data and other evidence when determining our estimate of the return on equity for the benchmark efficient entity. The first step in our approach, therefore, is to identify the relevant material that may inform our estimate of the return on equity. In this context, we consider the term 'relevant' to represent a low threshold. Table 5.1 and table 5.2 in section 5.3.2 list some of the material considered in this step.

The consideration of a broad range of material, however, does not require that all material be used to inform our estimate of the return on equity. This is discussed in further detail in section 5.3.2. Instead, we will use our assessment of the relevant material against the criteria to determine whether relevant material may inform our estimate of the return on equity. This assessment forms part of step two.

### 5.3.2    Step two: determine role

Under step two, the relevant material (identified in step one) is assessed against our criteria. This applies a consistent framework for all material. This assessment, including a description of the relevant material, is provided in appendices E, F and G.

The assessment of the relevant material against our criteria is further considered when determining where relevant material may best inform our estimate of the return on equity. Specifically, the relevant material may be used in one of four different ways:

(1)  Used as the foundation model.

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

(3)  Used to inform where within return on equity range, set by the foundation model, our 'final' return on equity point estimate should fall.

(4)  Not used to estimate the return on equity.[117]

Under our approach, however, relevant material will only be used once (to the extent practicable).[118] This avoids the potential for 'double counting' or unintended 'weight' to be assigned to a particular

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[117]  Some material may not be used to estimate the return on equity, but instead, may be used to assess the overall rate of return. As outlined in table 5.2, this includes RAB acquisition and trading multiples.

model or estimate. We consider this promotes transparency, and is consistent with our assessment criteria regarding the implementation of material in accordance with good practice.

Table 5.1 sets out our proposed use of the relevant models identified in step one. We propose to use the Sharpe–Lintner CAPM as the foundation model, and the Black CAPM and dividend growth model estimates to inform the Sharpe–Lintner CAPM input parameters. The Fama–French three factor model is not used.

The reasoning and logic underlying this step is discussed in greater detail in appendices E and F. For example, the sensitivity of the Black CAPM to implementation errors limits the ability to use the Black CAPM as the foundation model. Theoretical and empirical evidence, however, supports using the Black CAPM, to some extent, in the process for estimating the return on equity. As such, we propose to use the Black CAPM to inform the selection of the equity beta.

**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 (MRP) |
| Fama–French three factor model | No role |

Source:      AER analysis.

Table 5.2 sets out our proposed use of the other relevant material identified in step one. This includes information that will be used to inform foundation model input parameter estimates. It also includes material that will be used to inform our final estimate of the return on equity.

**Table 5.2      Role of other relevant information**

| Material (step one) | Role (step two) |
| --- | --- |
| 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) |
| Observed equity beta estimates | Inform foundation model parameter estimates (equity beta) |

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[118]   It is recognised that some level of overlap of models and input evidence is unavoidable. For example, we propose to use other regulators' estimates of the return on equity, notwithstanding that other regulators may rely on much of the same material. Alternative implementations of a particular model may also be considered in multiple categories.

| | |
|---|---|
| Commonwealth government securities | Inform foundation model parameter estimates (risk free rate) |
| Wright approach | Inform the overall return on equity |
| Takeover/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 |
| Debt spreads | Inform the overall return on equity |
| Dividend yields | Inform the overall return on equity |
| Comparison with return on debt | Inform the overall return on equity |
| Trading multiples | No role informing return on equity (assess overall rate of return only) |
| Asset sales | No role informing return on equity (assess overall rate of return only) |
| Brokers' WACC estimates | No role |
| Other regulators' WACC estimates | No role |
| Finance metrics | No role |

Source:     AER analysis.

### 5.3.3   Step three: implement foundation model

As outlined in step two, our proposed approach adopts the Sharpe–Lintner CAPM as the foundation model. The role of the Sharpe–Lintner CAPM, and the inclusion of only one model as a foundation model, reflects our assessment of the models against the criteria.[119] The estimation of the Sharpe–Lintner CAPM input parameters, including the role of information used to inform these estimates, is discussed in greater detail in appendix G. In summary, the implementation of the Sharpe–Lintner CAPM will include the following:

- The Sharpe–Lintner CAPM will be estimated as the sum of the risk free rate, and the product of the equity beta and MRP.

- The risk free rate will be estimated with regard to Commonwealth government securities. Given yields on these securities are readily observable, only a point estimate (and not a range) for the risk free rate will be determined.

- The method for estimating the risk free rate will be set out in the guideline, with the actual point estimate determined during the determination process.

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[119]     See appendix E for our assessment of the models against our criteria.

- The equity beta range will be estimated with regard to theoretical and empirical evidence—based on the observed equity beta for a comparator set of Australian energy networks, cross checked against overseas energy networks and other Australian utilities.

- The equity beta point estimate will be determined based on regulatory judgement, having regard to the theory underpinning the Black CAPM and regulatory precedent.

- The MRP range will be estimated with regard to theoretical and empirical evidence—based on evidence such as historical excess returns, survey evidence, financial market indicators, estimates from other regulators, and dividend growth model estimates.

- The MRP point estimate will be determined based on regulatory judgement, taking into account estimates from each of those sources of evidence (as discussed in appendix G).

- The range and point estimate for the return on equity will be calculated based on the range and point estimates from the corresponding input parameters. For example, the lower bound of the return on equity range would be calculated by applying the point estimate for the risk free rate and the lower bound estimates for the equity beta and MRP.

For clarity, the use of ranges and point estimates for the equity beta, MRP and the return on equity reflects the inherent uncertainty in determining precise estimates for these values.

### 5.3.4    Step four: other information

Under step four, other information that may inform our final return on equity point estimate is considered. This material was outlined in table 5.2, and is further explained in appendix F.

The form of other information, however, may differ for each alternative source. Specifically, some of the other information may provide a range for the return on equity, while others may provide only directional information.[120] In this context, directional information refers to the relativity of current estimates to a baseline value. For example, directional information may consider how the current estimate of a particular source of information differs from the corresponding estimate observed in other recent determinations. In some cases, the information source may also suggest a rough magnitude (as well as a direction). That is, an explanation may be that a given directional indicator has increased since the most recent determination, though not by a large amount. This may suggest that the return on equity should also have increased since the most recent determination, though not by a large amount.

Table 5.3 outlines the proposed form for each source of information used to inform our final estimate of the return on equity. Similar to step two, the form of alternative estimates will be guided by an assessment against our criteria.

**Table 5.3        Form of other information**

| Additional information | Form of information |
|---|---|
| Professor Wright approach | Range |

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[120]    A relative assessment will also be considered for the comparison of the return on equity with the return on debt. As discussed in appendix F, the return on equity is expected to be above the return on debt.

| Takeover/valuation reports | Range |
| --- | --- |
| Brokers' return on equity estimates | Range |
| Other regulators' return on equity estimates | Range |
| Debt spreads | Directional |
| Dividend yields | Directional |
| Comparison with return on debt | Relative |

Source:    AER analysis.

### 5.3.5    Step five: evaluate information set

This step requires the evaluation of the full set of material that we consider may inform, in some way, the estimation of the return on equity. This includes assessing the foundation model range and point estimate alongside the other information from step four.

In evaluating the full information set, the consistency (or otherwise) of the information is expected to be important. That is, circumstances where most of the other information suggests the return on equity should be above the foundation model estimate is likely to be more persuasive than if only a single estimate suggests an alternative value. The strengths and limitations of each source of additional information, however, will also be an important factor guiding the informative value of the available material. These strengths and limitations, as assessed against our criteria, are discussed in greater detail in appendix F. Appendix F also provides an indication of how the analysis undertaken in this step may be presented.

### 5.3.6    Step six: distil return on equity point estimate

Our proposed approach requires the determination of a single point estimate for the return on equity. As outlined in section 5.2, our starting point for estimating the return on equity will be the foundation model point estimate. Moreover, the final point estimate will be selected from within the foundation model range. The use of the foundation model to provide the range and starting point for the return on equity reflects our assessment of the Sharpe–Lintner CAPM against our criteria. In particular, our assessment of the Sharpe–Lintner CAPM determined that it is superior to all other models.

The final estimate of the return on equity, however, will ultimately require the exercise of regulatory judgement. This judgement will draw on the analysis of the other information provided in step five. For example, we may determine an estimate of the return on equity that is higher (lower) than the foundation model estimate where the other information indicates a higher (lower) return is appropriate. As noted in section 5.3.5, the relative strengths and limitations of each source of other information, as well as the consistency of this information, will be important.

Our proposed approach is premised on the expectation that the analysis in step five should not suggest a final estimate of the return on equity outside the foundation model range.[121] However, if this

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[121]    We consider this a reasonable expectation, as the uncertainty inherent in estimating input parameters is expected to result in ranges that are not overly narrow. The corresponding range for the return on equity, given these input parameter ranges, will necessarily be wider.

expectation is not met, we may reconsider the foundation model input parameter estimates, or more fundamentally, we may also reconsider the foundation model itself. This recognises that, ultimately, our rate of return must meet the allowed rate of return objective.

Further, under our approach, if the foundation model point estimate is not adopted, the final estimate of the return on equity will be determined as a multiple of 25 basis points. This recognises the limited precision that the return on equity can be estimated. It is also consistent with our proposed approach of only using the foundation model informatively.[122] The reasoning for this approach is discussed in greater detail in section 5.4. The selection of the final estimate of the return on equity as a multiple of 25 basis points, however, should not be interpreted as a rounding exercise. Instead, the analysis in step five will inform the direction and magnitude of the departure from the foundation model point estimate.

## 5.4    Reasoning

This section provides the reasoning for our proposed approach, and discusses the context in which it was developed. This section also discusses the alternative proposals from the ENA, APIA and consumers groups. Further detail regarding the reasoning for the role of relevant material under our approach, however, is provided in appendices E and F.

In summary, we consider our proposed approach will contribute to estimates of the rate of return that are consistent with the allowed rate of return objective. In particular, for the following reasons our proposed approach provides a balance between transparency, simplicity, certainty and replicability:

- Our proposed approach has been developed in consultation with a range of stakeholders, including service providers and their industry associations, investors, and consumer groups.

- Using the foundation model and other information informatively (as opposed to determinately) acknowledges the inherent uncertainty in estimating the return on equity. That is, it recognises that all models are incomplete and that some approaches provide greater insight than others.

- Using the foundation model and other information informatively (in addition to the use of ranges) acknowledges the need for regulatory judgement in estimating the return on equity. Given the breadth of material and range of values that may represent reasonable estimates of the return on equity, the use of judgement is unavoidable.

- Using the foundation model and other information informatively, and selecting a final estimate of the return on equity that is a multiple of 25 basis points (if departing from the foundation model estimate), disavows the pursuit of false precision.

- Using a foundation model, and drawing on other information to determine a final estimate of the return on equity may represent a more replicable and transparent process (than separately estimating and combining alternative models). The estimation of the other information to provide alternative estimates and directional information is also expected to be reasonably intuitive.

- Using a foundation model approach is transparent and simple to implement (particularly relative to combining disparate estimates of multiple models). For example, estimating the Sharpe–Lintner CAPM is a process that stakeholders are likely to already be familiar with (given its widespread use amongst market practitioners and other regulators). This may allow stakeholders to make

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[122]    That is, using the foundation model informatively, and determining a final return on equity with regard to additional information, implies a level of imprecision.

reasonable estimates of the returns expected to be determined in advance of a determination. This may also allow consumers to actively engage in the consultation process.

Using the Sharpe–Lintner CAPM as the foundation model reflects our assessment of the model against our criteria. Specifically, we consider it is superior to alternative models (for the purposes of estimating the return on equity for the benchmark efficient entity).

## 5.4.1 Regulatory judgement

Under the rules, we must have regard to relevant estimation methods, financial models, market data and other evidence when estimating the return on equity. Given the breadth of this material, the use of regulatory judgement in estimating the return on equity is unavoidable. Indeed, this was acknowledged by the AEMC, and in submissions from stakeholders. For example, the AEMC stated that we:[123]

> …must make a judgement in the context of the overall objective as to the best method(s) and information sources to use, including what weight to give to the different methods and information in making the estimate.

The ENA also stated that:[124]

> …there is an inherent element of judgement involved in factoring in all the relevant evidence.

Our proposed approach requires regulatory judgement throughout the process, including in the development of the rate of return guideline. In particular, our approach requires judgement to:

- determine the set of relevant material

- assess the relevant material against our criteria

- determine the role for all relevant material, based on our assessment against the criteria

- determine the implementation of input parameter estimates from relevant material

- distil a final estimate of the return on equity from a range of alternative estimates.

The application of regulatory judgement, while necessary, must also be accompanied by an appropriate level of reasoning. The extent of this reasoning, however, may vary across each stage of our process. For example, our assessment criteria provide a consistent framework for which to consider the merits of relevant material. This facilitates a detailed analysis of each model or information source. Further, models may be supported by more extensive quantitative evidence and subject to more detailed analysis and testing than other information (such as brokers' reports). A consequence of this may be that there is a more extensive discussion and analysis around the parameter values of the foundation model and comparisons with other models.

Our proposed approach also recognises that estimating the rate of return for a service provider is not a precise science. In particular, the return on equity is not observable. As stated by the APIA, estimates of the return on equity will be:[125]

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[123]  AEMC, *Rule determination: National electricity amendment (Economic regulation of network service providers) Rule 2012: National gas amendment (Price and revenue regulation of gas services) Rule 2012*, 29 November 2012, p. 67.
[124]  ENA, *Response to the AER's rate of return guidelines consultation paper*, 28 June 2013, p. 70.
[125]  Australian Pipeline Industry Association (APIA), *Response to the AER's rate of return guidelines consultation paper*, June 2013, p. 44.

> …approximations to unknown true values, and must be determined through the application of relevant theory and practice.

The application of relevant theory and market practice, however, may not necessarily result in the determination of precise estimates. Notably, all financial models are a simplification of the real world to allow us to draw insights into key relationships and determinants. Our approach draws on the key elements from a number of models, but recognises that all models are incomplete and that some approaches provide greater insight than others. In this context, we consider there is a limit to the specificity for which estimates of the return on equity can be determined. Accordingly, under our proposed approach, we only use model estimates informatively.

Our proposed approach further recognises the limited specificity for which estimates of the return on equity can be determined. It does so by only selecting estimates of the return on equity as multiples of 25 basis points (if departing from the foundation model estimate). In reaching this view, we considered four alternatives, including determining the return on equity:

(1) To two decimal places.

(2) To one decimal place.

(3) To a multiple of 25 basis points.

(4) To a multiple of 50 basis points.

We consider that determining estimates of the return on equity as multiples of 25 basis points is reasonable, as the nature and breadth of the task before us does not support finer gradations. Notably, the material we intend to consider spans a wide range of potential values.

We have also considered the materiality of determining estimates of the return on equity as multiples of 25 basis points. For example, a 25 basis point difference in estimates of the return on equity would result in a 10 basis point difference in the overall rate of return (based on our gearing assumption). This is expected to translate to revenue differences of less than one per cent.[126] We consider, therefore, that choosing a value as a multiple of 25 basis points (if departing from the foundation model estimate) appropriately balances the imprecise nature of the task before us with the materiality of our decision.

## 5.4.2 Stability of returns on equity

In our consultation paper, we stated that a relatively stable regulatory return on equity would have two effects:

- It would smooth prices faced by consumers

- It would provide greater certainty to investors about the outcome of the regulatory process.

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[126] For example, using the published post–tax revenue models from a sample of service providers (ElectraNet, Powerlink, Envestra (Victoria) and Aurora), the respective revenue impacts of a 25 basis point change in the return on equity ranges from 0.7 to 0.9 per cent.

In general, these considerations were supported by investors. For example, RARE Infrastructure stated the following:[127]

> A more stable return on equity would enhance clarity for all investors, and boost the desirability of Australian network businesses in the global investment universe (leading to lower cost of capital, which is in consumer interests).

Given network assets are long–lived and typically generate stable cash–flows, some stability in the return on equity may be expected. That is, it may be reasonable to expect that, on average, the difference between contemporaneous and long–term estimates of the return on equity should be low. The theoretical and empirical evidence, however, suggests the return on equity is not stable over time.[128]

We consider that our proposed approach appropriately balances the theoretical and empirical evidence with the characteristics of regulated infrastructure. For example, our implementation of the Sharpe–Lintner CAPM will result in estimates of the return on equity that may vary over time. Alternatively, the Wright approach for implementing the Sharpe–Lintner CAPM will result in estimates of the return on equity that may be relatively stable over time. The informative use of these implementations of the Sharpe–Lintner CAPM, in addition to other information, is expected to lead to more stable estimates of the return on equity than under our previous approach. The extent of this stability will depend on:

- the extent to which movements in the estimates of the risk free rate and market risk premium in the foundation model offset each other

- the informative value provided by the Wright approach (and other information that provides relatively stable estimates of the return on equity).[129]

That required returns on equity are more stable over time than those generated using our previous approach is supported by the ENA.[130] That said, consumer groups were more circumspect. Consumers supported more stable returns and consequently more stable prices, but not at any cost.[131] Specifically, consumers did not support more stable (long term) prices where these prices do not reflect efficient financing costs.[132] For the reasons outlined in section 5.4, however, we consider that our proposed approach will lead to estimates of the return on equity which best reflect efficient financing costs.

### 5.4.3 Alternative approaches

Our consultation paper outlined four broad approaches for estimating the return on equity. These approaches were:

(1) Use a primary model (only).

(2) Use a primary model with reasonableness checks.

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[127] RARE Infrastructure Limited (RARE), *Submission to AER's rate of return guidelines consultation paper*, 14 June 2013. Also, see: The Financial Investor Group (FIG), *Response to the AER's rate of return guidelines consultation paper*, 24 June 2013.
[128] See, for example: AER, *Access arrangement final decision Envestra Ltd 2013-17, part 3: appendices*, March 2013, pp. 30–31.
[129] For example, takeover and valuation reports, and broker return on equity estimates may also be relatively stable.
[130] ENA, *Response to the consultation paper*, June 2013, p. 46.
[131] Public Advocacy Centre Ltd (PIAC), *Submission to the AER's rate of return guidelines consultation paper*, 21 June 2013, p. 9.
[132] Major Energy Users (MEU), *Response to the AER's rate of return guidelines consultation paper*, June 2013, p. 8.

(3) Use several primary models with quantitative but simple fixed weights.

(4) Use multiple models and other information.

Our proposed approach draws on aspects of each of these alternatives. Submissions to our consultation paper, however, typically considered the first and third options to be too inflexible. Alternatively, there was broad support for the second or fourth options. These options both proposed to consider a broader range of material when estimating the return on equity.

The approaches proposed by the ENA, APIA and consumer groups are discussed in greater detail below.

## ENA's multiple model approach

The ENA described their approach as containing four key steps. These steps are:

(1) Identify the models, methods, data and evidence to use.

(2) Compute the best estimate of the required return for an average firm.

(3) Compute the best estimate of the required return for a benchmark efficient entity using each approach and piece of evidence.

(4) Distil a final estimate of the required return on equity.

A key consideration in the ENA approach is the concept that the required return on equity for the average firm should first be determined. This return, which is equivalent to the return on the market portfolio, is then used to populate the alternative return on equity models. The ENA labelled this approach as 'cross fertilisation', and considered this will ensure alternative model estimates only differ to the extent that the models themselves differ.

The 'cross fertilisation' approach, however, leads to relevant material being considered multiple times. This limits the transparency of the ENA's approach, as it makes it difficult to discern the impact of any one particular model on the final estimate of the return on equity. Specifically, in the ENA's example, it assigns one third weight to dividend growth model estimates. One third weight is then assigned to the estimate of the average firm, but this itself is derived entirely by dividend growth model estimates. One sixth weight is then assigned to each of the Sharpe–Lintner CAPM and the Fama–French three factor model. Again, the determination of these models incorporates dividend growth model estimates of the return on the market. The extent of this double–counting is not consistent with the implementation of an approach in accordance with good practice.[133]

A further characteristic of the ENA's proposed approach is its complexity. For example, the ENA approach requires the full parameterisation of the Sharpe–Lintner CAPM, Fama–French three factor model and multiple dividend growth models. The ENA's approach also requires the quantification of weights to be assigned to each of these estimates, including the return on the market. For the following reasons, we consider this complexity is not consistent with our fitness for purpose criterion:

▪ It may be difficult for stakeholders to make reasonable estimates of the returns expected to be determined using the ENA's approach (in advance of a determination). As noted in our

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[133] The ENA approach also places substantial weight on the Fama–French three factor model and the Black CAPM. As discussed in appendix E and appendix F, we consider that these models may not meet most of our criteria.

consultation paper, and in stakeholder submissions, the guideline should provide certainty and predictability to assist investors in making their investment decisions.[134]

▪ It may significantly increase the administrative burden on all stakeholders. For example, the ENA's submission supporting its proposed approach for estimating the return on equity totalled nearly 900 pages, and included 12 consultant reports. In particular, given their limited resources, it may be difficult for consumers to actively engage with this level of analysis.

▪ The greater use of complex econometric models increases the arcane nature of the cost of capital debate. Given that the level of precision for which equity returns can be estimated is limited (see section 5.4), we consider such complexity is not justified.

▪ The greater use of complex econometric models also increases the potential for regulatory gaming. The Fama–French three factor model and the ENA's preferred dividend growth model are both very complex. This complexity limits the ability to understand the variables driving these outputs, and to assess the reasonableness of these outputs. In contrast, the Sharpe–Lintner CAPM and more simplistic dividend growth models are intuitive, and are amenable to robust and coherent analysis.

On balance, we consider that our proposed approach provides a better balance between transparency, simplicity, certainty and replicability.

## APIA's proposed approach

In response to our issues paper, the APIA proposed the following approach to determining the return on equity:

(1) Determine the set of relevant models and information.

(2) For each model, determine a range for the return on equity for the benchmark efficient entity.

(3) Distil the multiple return on equity ranges for the benchmark efficient entity into a single point estimate.

(4) Consider whether the estimate of the return on equity for the benchmark efficient entity should be further adjusted to reflect the unique risks of the specific service provider.

In our consultation paper, we considered the extent to which the relevant material used to estimate the return on equity should differ dependent on specific circumstances. We concluded, however, that it would not be feasible to change the weights placed on different models over time based on differing market conditions, industry segments or firms. The reasons for this approach, as outlined in our consultation paper, remain valid. This includes the following:[135]

▪ There is a high degree of imprecision already inherent in the available return on equity models. Given this imprecision, it is not feasible to take the additional step of determining which model may perform best in particular circumstances.

▪ The approach proposed by the APIA would require the categorisation of prevailing market conditions. For example, one of the matrices outlined in the Brattle Group report required

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[134]     FIG, *Response to the consultation paper*, June 2013, p. 1.
[135]     AER, *Better Regulation: Rate of Return Guidelines: Consultation paper*, May 2013, pp. 45–46.

determining whether the stability of prevailing industry growth forecasts are high, average or low relative to historical values. Defining these thresholds, however, would only introduce an additional layer of imprecision into estimates of the return on equity.

The APIA also supported the determination of the return on equity for the average firm, as proposed by the ENA.[136] We have outlined our concerns with the ENA's multiple–model approach previously in this section.

## Consumer submissions

Consumer group submissions primarily focused on elements of the approaches proposed in our consultation paper, or in submissions from the ENA and the APIA. In particular, consumer groups were more supportive of adopting a primary model with reasonableness checks.[137] They considered this approach provided a balance between simplicity, transparency and consistency, with the flexibility to modify the approach to reflect market circumstances.[138]

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[136] APIA, *Response to the consultation paper*, June 2013, p. 31.
[137] See, for example: PIAC, *Submission to the consultation paper*, June 2013, p. 22; MEU, Re*sponse to the consultation paper*, June 2013, pp. 33–34.
[138] See, for example: PIAC, *Submission to the consultation paper*, June 2013, p. 22; MEU, Re*sponse to the consultation paper*, June 2013, p. 36.

# 6 Return on debt: approach

This chapter deals with the conceptual issues related to return on debt estimation. Sections 6.1 and 6.2 present the issue and the conceptual approach we propose in the draft guideline. Section 6.3 elaborates on the reasons for the proposed approach.

## 6.1 Issue

We must set out in the draft rate of return guideline the methodologies we propose to use in estimating the return on debt component of the allowed rate of return. We must also set out how those methodologies are proposed to result in the determination of a return on debt in a way that is consistent with the allowed rate of return objective.[139] This is to apply to electricity and gas, and transmission and distribution, taking into account the definition of the benchmark efficient entity (see chapter 3).

## 6.2 Proposed approach

To estimate the return on debt we propose:

- To use a trailing average portfolio approach, that is, to estimate:[140]

    - the average return that would have been required by debt investors in a benchmark efficient entity if it raised debt over an historical period prior to the commencement of a regulatory year in the regulatory control period.

- To update the return on debt estimate annually (i.e. for each regulatory year).

- To apply equal weights to all the elements of the trailing average,

- To implement transitional arrangements consistent with the 'QTC method' (an annual re-pricing of a portion of the notional debt portfolio) and the benchmark term of seven years.

## 6.3 Reasoning

This section details the reasons for the approach we propose to estimating the return on debt:

- Subsection 6.3.1 provides the background.

- Subsection 6.3.2 discusses our decision to propose a single approach for the benchmark efficient entity.

- Subsection 6.3.3 reviews efficient debt financing practices.

- Subsection 6.3.4 reviews the three approaches listed in the rules and provides reasons for our preferred approach.

- Subsections 6.3.5 and 6.3.6 consider specification of the trailing average portfolio approach with respect to annual updating and weighting schemes.

- Subsection 6.3.7 concludes with our considerations on the need for a transition and our proposed method of transition.

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[139]   NER, cl. 6.5.2(n) and 6A.6.2(n), NGR, r.87(14).
[140]   NER, cl. 6.5.2(j) and 6A.6.2(j), NGR, r.87(10).

## 6.3.1 Background

Prior to the November 2012 rule change final determination, we used the definitions in the previous rules so that the expected return on debt was the nominal risk-free rate plus the debt risk premium (DRP).[141] We estimated the DRP in our recent decisions using: an appropriate benchmark; and a method used to estimate the DRP that conforms to these benchmark parameters.[142] The risk free rate was the same as for the return on equity.[143]

We and the Energy Users Committee both expressed concern during the rule change process that the approach under the previous rules was not producing an appropriate estimate of the return on debt for a benchmark efficient entity.[144] In the final rule change determination, the AEMC gave us the discretion to propose an approach that we consider best contributes to the achievement of the overall allowed rate of return objective.

The AEMC specified three approaches to estimating the return on debt that a regulator could reasonably contemplate, which should reflect one of the following:[145]

- The return that would be required by debt investors in a benchmark efficient entity if it raised debt at the time or shortly before the making of the distribution determination for the regulatory control period.

- The average return that would have been required by debt investors in a benchmark efficient entity if it raised debt over an historical period prior to the commencement of a regulatory year in the regulatory control period.

- Some combination of the above.

For simplicity, we refer to these as the 'on the day', trailing average portfolio and hybrid portfolio approaches, respectively. We consider the merits of each approach in the context of the benchmark efficient entity and assess the extent to which they promote efficiency.

## 6.3.2 Menu of approaches

As detailed in chapter three, we propose to use a single definition of a benchmark efficient entity for the purpose of estimation of the allowed rate of return on capital. In particular, we do not consider that factors such as difference in size or ownership structure of service providers justify the adoption of different benchmark definitions. Given the definition of the benchmark efficient entity, we must specify the methodology we propose to use for estimating the allowed return on debt. There are two conceptually distinct options we could adopt in the guideline: providing details of a single estimation approach and a so-called 'menu approach'.

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[141] NER, version 52, cls. 6.5.2(b) and 6A.6.2(b).

[142] See, for example: AER, *Access arrangement final decision APA GasNet Australia (Operations) Pty Ltd 2013-17 attachment*, March 2013, pp. 91–92; AER, *Access arrangement final decision Envestra Ltd 2013-17 attachment*, March 2013, p. 150; AER, *Access arrangement final decision Multinet Gas(DB No.1)Pty Ltd Multinet Gas (DB No.2) Pty Ltd 2013-17 attachment*, March 2013, pp. 133–134; AER, *Access arrangement final decision SPI Networks (Gas) Pty Ltd 2013-17 attachment*, March 2013, pp. 112–113; AER, *Draft decision, ElectraNet transmission determination 2013-14 to 2017-18*, 29 November 2012, pp. 167–170; AER, *APT Petroleum Pipeline Pty Ltd access arrangement final decision Roma to Brisbane Pipeline 2012-13 to 2016-17*, August 2012, pp. 62–64;

[143] See, for example: AER, *Access arrangement final decision APA GasNet Australia (Operations) Pty Ltd 2013-17 attachment*, March 2013, p. 55.

[144] AEMC, *Summary of issues raised in submissions on the directions paper*, p. 9, 15.

[145] AEMC, *Rule determination National Electricity Amendment Rule 2012, National Gas Amendment Rule 2012*, 29 November, 2012, p. 90.

In their submissions to the issues paper service providers and their industry representatives advocated a 'menu approach'. This would involve us providing details on how we would estimate the return on debt under each of the three approaches in the guideline. During a particular determination, service providers could then propose, and we could adopt the approach to estimating the return on debt that best matches the debt management practice of an efficient service provider in the circumstances.[146]

In the consultation paper, we asked interested stakeholders to comment on whether they support having a single approach for estimating the return on debt for each definition of the benchmark efficient entity.[147]

Most consumer representatives strongly supported the adoption of a single trailing average portfolio approach. They considered that a 'menu approach' will create an opportunity for gaming across regulatory periods and have no off-setting benefit.[148] PIAC further noted we should avoid attempts to create a 'spurious' level of accuracy by establishing multiple benchmarks that reflect individual firm characteristics.[149] The MEU submitted that we should consider a revealed cost approach, accompanied by a sharing scheme.[150] We discuss this approach in appendix A.

Most service providers and their industry representatives supported a trailing average portfolio approach. However, they submitted the guideline should outline all three approaches that are stated in the rules.[151] They considered there could be more than one efficient financing approach and no single approach to measure the return on debt will be appropriate to all businesses.[152] Further, the ENA submitted that we could reject a service provider's proposal 'if it is not well reasoned in terms of the business recovering efficient financing costs'.[153] In this way, the ENA considered the potential 'strategic behaviour' associated with the 'menu approach' would be mitigated.[154] Jemena submitted service providers do not only face incentives to select the benchmark that results in the highest allowed revenue, they also seek stable cash flows. As a result it would be harder for service providers to raise the funds if they regularly switch between benchmarks.[155]

As further discussed in the next section, we acknowledge there may be a number of approaches to the return on debt estimation that could be consistent with the rules, the RPP, NEO and NGO. However, we consider that the rules do not require us to discuss and provide detail of all possible variations of approaches to estimation of return on debt. Rather, our task is to detail the methodologies we propose to use.[156]

In addition, we consider that, as long as the adopted approach satisfies the rules, the RPP, NEO and NGO, there is no need for it to be tailored to the individual circumstances of service providers.

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[146] See, for example: ENA, *Response to the AER's rate of return guidelines issues paper*, February 2013. p. 27–29.
[147] AER, *Rate of return consultation paper,* May 2013, p. 56.
[148] EUAA, *Response to the consultation paper*, June 2013, p. 7; PIAC, *Submission to the consultation paper*, June 2013, pp. 27–29.
[149] PIAC, *Submission to the consultation paper*, June 2013, pp. 29.
[150] MEU, *Response to the consultation paper*, June 2013, pp. 38–39.
[151] ActewAGL, *Response to the consultation paper*, June 2013, p. 2; ENA, *Submission to the consultation paper*, June 2013, p. 99.
[152] APA, *Submission to the consultation paper*, June 2013, p. 7; FIG, *Response to the consultation paper*, June 2013, p. 35; RARE, *Submission to the consultation paper*, June 2013, p. 2.
[153] ENA, *Submission to the consultation paper*, June 2013, p. 99.
[154] ENA, *Submission to the consultation paper*, June 2013, p. 99.
[155] Jemena, *Submission to the consultation paper*, June 2013, pp. 12–16.
[156] NER, cl. 6.5.2(n) and 6A.6.2(n), NGR, r.87(14).

Further, we consider that one of the objectives of the guideline and the Better Regulation program is to provide regulatory certainty and transparency. As PIAC stated in its submission to the consultation paper:[157]

> Consistency in regulatory approach is an important objective and, therefore, while the AER now has the flexibility under the Rules to adapt its approach when circumstances change, this should only be done when there is unambiguous evidence that the changes represent a long-term shift, not a temporary aberration.

Regulatory certainty is also highly valued by service providers and their investors:[158]

> Regulatory uncertainty is the most significant concern for investors in ASX listed network utilities.

As identified above, we propose to adopt the trailing average portfolio approach to estimation of the return on debt allowance. We consider that adoption of this approach is a major change in the regulatory framework. We arrived at this decision through an extensive consultation process and analysis. A major change in regulatory approach requires a strong level of commitment from all stakeholders. We do not think that the use of a 'menu approach' would be consistent with the commitment required for this regulatory change.

Further, as we stated in the consultation paper we consider that the 'menu approach' would not be consistent with the principles of incentive-based regulation.[159] Specifically, it would not encourage efficient debt financing. A service provider would have an incentive to choose the option that maximises its total revenue. For instance, the prevailing rate of return on debt at the start of a regulatory control period may be high relative to its historic average. If so, a service provider might prefer the 'on the day' approach to a portfolio approach. If the prevailing rate of return on debt subsequently fell by the beginning of the next regulatory control period, its preferences may change in favour of a portfolio approach.

These gaming incentives may be reduced by introducing transitional arrangements between the approaches. However, a 'menu approach' coupled with transitional arrangements would still raise concerns. If a service provider chose to switch back to a different approach at a later day, the regulator would potentially face the complex task of working out a transitional arrangement to apply within another transitional arrangement. We do not consider this to be a desirable outcome.

For the above reasons, we consider that it is preferable to set out one approach in the guideline rather than providing a menu of possible approaches. Therefore, we propose to use a single approach to estimating the return on debt for the benchmark efficient entity in the draft guideline.

### 6.3.3   Efficient debt financing practices

The following subsection considers what economic efficiency implies in the context of debt financing, discusses the role of financial risk management principles in assessing efficiency, and examines the relationship between the regulatory framework and debt financing practices of regulated entities.

#### Economic efficiency of debt financing

The allowed rate of return objective requires '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

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157   PIAC, *Submission to the consultation paper*, June 2013, p. 6.
158   Paul Johnston, *Investor perspectives on energy market reform*, Presentation to ENA forum, 24 July 2013, p. 2.
159   AER, *Rate of return consultation paper*, May 2013, p. 52.

risk as that which applies to the [service provider] in respect of the provision of [regulated services]'.[160] Therefore, it is important to be clear about how we identify efficiency and what would represent efficient debt financing costs.

Economists typically think of efficiency in three dimensions: productive, allocative and dynamic.[161] In the context of debt financing, we consider:

▪ productive efficiency refers to least cost financing (i.e. the lowest required return on debt)

▪ allocative efficiency refers to the allowed return on debt reflecting the expected required return on debt, and

▪ dynamic efficiency refers to the existence of appropriate incentives for inter-temporal decisions of energy consumers and investors.

To achieve productive efficiency we need service providers to face incentives to seek the lowest cost financing. Allocative efficiency can be achieved by setting the allowed return on debt such that it reflects the lowest debt financing cost that a benchmark efficient entity could realistically achieve. We can encourage dynamic efficiency by setting an allowance that reflects the expected required return on debt.

The AEMC's rule change determination recognised the above considerations. It noted that the rate of return on debt framework should reflect the allowed rate of return objective and:[162]

> ...should try to create an incentive for service providers to adopt efficient financing practices and minimise the risk of creating distortions in the service provider's investment decision.

The above considerations are also consistent with the RPP, NEO, and NGO. In particular, achievement of the allowed rate of return objective together with productive and allocative efficiency is consistent with the requirement to provide a service provider with a reasonable opportunity to recover at least efficient costs.[163] Similarly, ensuring a dynamically efficient outcome reflects the requirements to provide a service provider with effective incentives in order to promote efficient investment and to have regard to the economic costs and risks of the potential for under and over investment.[164] Further, inefficient debt financing practices are unlikely to result in an efficient regulatory outcome with respect to investment in, operation and use of electricity and natural gas services for the long term interests of consumers. As summarised by Jemena:[165]

> Efficient investment is linked directly with the concept of 'efficient financing costs', as set out in the allowed rate of return objective…The argument goes that if the rate of return is based on efficient costs then this should attract efficient investment. For the cost of debt benchmark specifically, this means ensuring that NSPs can attract sufficient debt in the short-term to fund efficient long-term investment in their networks.

Accordingly, considerations of productive, allocative, and dynamic efficiency of debt financing are also aligned with NEO and NGO.

In its submission to the consultation paper the APIA submitted that:[166]

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160 NER, cl. 6.5.2(c) and cl. 6A.6.2(c), NGR, r.87(3).
161 Australian Government, *National Competition Policy Review*, 25 August 1993, pp. 3–4.
162 AEMC, *Rule Determination*, 29 November 2012, p. 73.
163 NEL, s. 7A(2); NGL, s.24(2).
164 NEL, s. 7A(3), s. 7A(6); NGL, s.24(3), s.24(6).
165 Jemena, *Submission to the consultation paper*, June 2013, p. 9.
166 Australian Pipeline Industry Association (APIA), *Response to the AER's rate of return guidelines consultation paper*, June 2013, p. 34.

> …allocative efficiency is not one of the factors that the AER must give regard to in determining the return on debt (see Section 87(11) of the NGR).

We disagree. Allocative efficiency is an integral part of the overall efficiency framework. The allowed rate of return objective requires us to have regard to the efficient financing costs of a benchmark efficient entity.[167] In addition, the rules require us to have regard to 'the desirability of minimising any difference between the return on debt and the return on debt of a benchmark efficient entity referred to in the allowed rate of return objective'.[168] This requirement is consistent with allocative efficiency.

## Role of financial risk management principles in assessing efficiency

As we stated in the consultation paper, when assessing different interpretations of efficiency, it is important that we consider any practical constraints for debt financing. These include imperfect information, transaction costs, liquidity constraints and limitations in accessing markets.

We acknowledge the QTC's view on the relevance of financial risk management principles in assessing the efficiency of different return on debt approaches:[169]

> These principles allow the broader objectives of debt management to be considered, such as managing various risks to reduce the probability of financial distress. The principles can also capture the risks faced by consumers under different return on debt approaches.

> …an efficient debt financing strategy is one that results in a business's equity providers being exposed to an acceptable level of refinancing and interest rate risk, taking into account the business's size, asset life, capital structure and the characteristics of the firm's cash flows.

In the 2009 WACC review we recognized that 'the central task of the Treasury function at [regulated energy network] businesses is to manage risks (i.e. refinancing, interest rate and currency risks) at the lowest possible costs' and the 'complex trade-off between refinancing risk and the cost of debt':[170]

> …it is clear that the preference for long term debt is balanced with the competing objectives of:

> ▪ the need to diversify across different maturities, and

> ▪ minimising the overall cost of debt.

We also observed that 'according to the Treasurers, having a debt portfolio with staggered maturity dates is critical to mitigating refinancing risk'.[171] The issues related to the benchmark debt maturity are discussed in more detail in section 7.3.3. In this chapter we focus on the key aspects of the efficient debt financing practices that allow us to assess the conceptual approaches to estimating the allowed rate of return on debt.

Service providers submitted that, since financial markets are imperfect, a service provider's optimal approach to financing depends on the exposure to potential refinancing risk, as well as other practical constraints in debt financing.[172]

Refinancing risk is the risk that a firm would not be able to efficiently finance its debt at a given point in time. This may be because the debt instruments that it seeks are not available to it, or because they are expensive. Refinancing risk is often due to systematic factors, such as macroeconomic

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[167]   NER, cl. 6.5.2(c) and cl. 6A.6.2(c), NGR, r.87(3).
[168]   NER, cl. 6.5.2(k)(1) and cl. 6A.6.2(k)(1), NGR, r.87(11)(a).
[169]   QTC, *Submission to the consultation paper*, June 2013, p. 21.
[170]   AER, *Final decision: WACC review,* May 2009, pp. 150, 152.
[171]   AER, *Final decision: WACC review,* May 2009, p. 151.
[172]   See, for example: CEG, *Efficiency of staggered debt issuance*, February 2013, (attachment to NSW DNSP, Submission to AER's rate of return guidelines issues paper,18 February 2013), pp. 9–13.

trends or changes in debt market liquidity. However, refinancing risk may also result from company-specific matters. For example, if lenders knew that a company needed to refinance its debt at a certain time or risk bankruptcy, they might raise the interest rates that they demand from the company.

The significance of refinancing risk as a concern for businesses can be noted from the view of credit rating agencies, such as Standard & Poor's. The rating agency stated that:[173]

> Even when analyzing highly creditworthy companies, it is necessary to be aware of the overall maturity structure and potential for refinancing risk.

Most service providers hold a diversified portfolio of different types of debt with staggered terms to maturity.[174] This ensures that a service provider will only have to refinance a proportion of its debt over time. This diversification of types of debt with different terms to maturity allows a service provider to manage its refinancing risk.[175,176] The majority of the stakeholders' submissions supported this view, for example, CitiPower, Powercor, and SAPN submitted that:[177]

> The characteristics of an Australian network business are such that it is efficient financing practice to stagger issuances to manage refinancing risk.

The need to manage refinancing risk is balanced against the overall cost of a service provider's debt portfolio. In particular, a longer average term of debt for a debt portfolio means lower refinancing risk. But it also means the total cost of the debt portfolio is higher. Hence, the efficient debt financing practices would address this trade-off.

## Relationship to the regulatory setting

During the rule change process the AEMC said:[178]

> …the long-term interests of consumers would be best served by ensuring that the methodology used to estimate the return on debt reflects, **to the extent possible**, the efficient financing and risk management practices that might be expected in the absence of regulation [emphasis added].

This statement was made in section 7.2.1 of the AEMC final rule change determination. Given the context of the section, it seems that the intention of the AEMC was to emphasise that some of the current debt financing practices of the regulated businesses are the product of the regulatory framework. In particular, they appear to result from the 'on the day' approach to estimating return on debt which we currently use. We do not interpret the above statement to mean that the risks regulated energy businesses face are identical to those unregulated businesses face.

Indeed, we consider that the benchmark efficient entity should be a regulated energy business. Regulated businesses align their business practices with the regulatory regime. Therefore, they may have a different risk exposure compared to unregulated businesses. Given the adopted regulatory approach to return on debt estimation, service providers choose their debt management strategies to

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173 Standard and Poor's, *2008 Corporate criteria: Analytical Methodology*, April 2008, pp. 31–32.
174 See, for example: ENA, Response, *Attachment 17: Debt strategies of utility businesses, CEG*, June 2013, pp. 16–22; SP AusNet, *Submission to the consultation paper*, June 2013, p. 1; NSW DNSP, *Submission to the consultation paper*, June 2013, p. 5.
175 NSW DNSP, *Submission to AER's rate of return guidelines consultation paper*, 21 June 2013, p. 3.
176 Public Advocacy Centre Ltd (PIAC), *Submission to the AER's rate of return* guidelines *consultation paper*, 21 June 2013, p. 20.
177 Citipower, Powercor and SA Power Networks, *Response to the AER's rate of return guidelines consultation paper*, 28 June 2013, p. 6.
178 AEMC, *Final rule change determination*, 29 November 2012, p. 76.

best address refinancing risk and interest rate risk and 'seek to align their debt management practices with the approach':[179,180]

> The ability to emulate the benchmark debt management approach is essential to minimise the risk of significant mismatch between the regulatory cost of debt allowance and the regulated businesses' actual cost of debt. If the regulated businesses can engage in debt management practices that match the benchmark efficient approach, this provides a natural hedge to the regulatory benchmark. This is highly attractive for regulated network businesses, especially when debt markets are volatile. In turn, the desire to achieve a natural hedge ensures that regulated network businesses actually engage in the efficient benchmark debt management practice.

That is, each approach to estimating return on debt corresponds to a set of debt financing practices a service provider would use to manage the financial risks it faces. Therefore, each approach should be assessed on the basis of whether those debt financing practices are efficient and promote overall efficiency in a manner consistent with the NGO and NEO. An approach that reflects efficient financing practices of unregulated businesses would be desirable if it achieves the NGO and NEO and satisfies the RPP.

At the same time, Jemena points out that there might be other approaches that achieve the same purpose:[181]

> Some may argue that the regulatory framework should seek to replicate a competitive market. But this is not actually required by the National Gas Rules (NGR) or Law (NGL), or the National Electricity Rules (NER) or Law (NEL) (see section 3). Instead these rules and laws seek to establish incentives for NSPs and set tariffs in a way that promotes the long-term interests of consumers – as embodied in the National Gas Objective (NGO) and National Electricity Objective (NEO).

> Thinking about the regulatory framework in this way is not new. In fact, the current approach used to set the regulatory asset base (RAB) is also a regulatory bargain where NSPs are protected from random shocks to the value of its assets. This protection materially reduces risks to NSPs, which is passed on to consumers in the form of more stable (and lower) tariffs over time.

As we stated in section 6.3.2, we acknowledge there may be a number of approaches to the return on debt estimation that could be consistent with the rules, the RPP, NEO and NGO. However, we consider that the rules do not require us to discuss and provide detail of all possible variations of approaches to estimation of return on debt. Rather, our task is to detail the methodologies we propose to use.[182]

### 6.3.4 Consideration of the three approaches

This section provides a brief outline of each of the approaches identified in the rules.

#### On the day approach

Our current methodology is an 'on the day' approach. It estimates the return on debt of a service provider as the prevailing return on debt as close as possible to the start of the regulatory control period.[183] Conceptually, the 'on the day' return on debt estimate would reflect the return on debt of the benchmark efficient entity that raises all debt required to satisfy its financing needs once (i.e. just ahead of the start of each regulatory control period).

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[179]   SFG Consulting, *Rule change proposals relating to the debt component of the regulated rate of return*, Report for AEMC, 21 August 2012, p. 5.
[180]   NSW DNSP, *Submission to the consultation paper*, June 2013, p. 5.
[181]   Jemena, *Submission to the consultation paper*, June 2013, p. 3.
[182]   NER, cl. 6.5.2(n) and 6A.6.2(n), NGR, r.87(14).
[183]   In practice, this approach uses a short averaging period of 5-40 days shortly before the determination is made. See, for example: AER, *Final decision: WACC review,* May 2009, pp. 19–20, 171.

A service provider can align its debt management practices with the 'on the day' approach if it engages in one of the following debt financing practices:

- It refinances the entirety of its debt in the prevailing market conditions at the beginning of the regulatory control period.

- It engages in some other financing practice, but enters into hedging arrangements to replicate a borrowing cost structure that would arise if it did refinance the entirety of its debt at the beginning of the regulatory control period.

As we discuss in section 6.3.3, raising the entirety of the benchmark efficient entity's debt once for every regulatory control period would expose the benchmark efficient entity to substantial refinancing risk. Therefore, it may not be an efficient financing practice. As the QTC stated in its submission to the consultation paper:[184]

> When using risk as the criteria to assess efficiency, the 'on the day' approach is clearly inefficient because the implied debt funding strategy would expose a stand-alone service provider to an unacceptably high level of refinancing risk. In practice, it would not be possible for the majority of businesses to implement this strategy.

Further, holding a portfolio of debt with staggered maturities has the potential to result in a mismatch between the regulatory return on debt allowance and the actual return on debt of a service provider. This is referred to as interest rate risk. Some service providers may consider that any interest rate risk is acceptable and therefore not engage in any risk mitigation. However, some service providers may choose to mitigate this interest rate risk, through hedging the base rate component of the return on debt.[185] However, as Chairmont Consulting pointed out:[186]

> For an Australian efficient operator there is no market to effectively, and in a cost efficient manner, hedge their DRP.

Hence, irrespective of a service provider's debt financing and hedging practices the service provider is not able to alleviate all of the mismatch in relation to the debt margin component of the return on debt, unless it issues the entirety of its debt during the averaging period.

The above issues were raised in stakeholder submissions to the consultation paper. For instance, Jemena submitted that:[187]

> In practice, no NSPs regulated by the AER actually refinance their entire debt portfolio during the averaging period. Doing so would expose most NSPs to an unacceptable risk that they are unable to raise debt during the short-term averaging period. Capital markets are constantly changing so there is no guarantee that an NSP could get a debt issue away over that period. For larger NSPs with much larger debt portfolios, this concern is compounded by the uncertainty over whether these markets are deep enough to handle their refinancing needs.
>
> Instead, NSPs typically use swap transaction to hedge interest rate exposure for the duration of the regulatory period…and issue timing and market choice to manage risks in the DRP component.

The methodology we currently adopt is only one example of an 'on the day' approach. 'On the day' approaches contain a range of methods that can differ with respect to the length and timing of the averaging period, as well as the structure of the return on debt allowance. For instance, another example of an 'on the day' approach would be to align the term of the base rate of the return on debt

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184    QTC, *Submission to the consultation paper*, June 2013, p. 21.
185    For example, the service provider can achieve this by issuing floating-rate debt in a staggered fashion and then entering 'pay fixed' interest rate swaps during the averaging period.
186    Chairmont Consulting, *Comparative Hedging Analysis*, 12 June 2013, p. 17.
187    Jemena, *Submission to the consultation paper*, June 2013, p. 19.

allowance with the length of the regulatory control period and its credit margin component with the benchmark debt maturity.[188]

## Trailing average portfolio approach

The trailing average portfolio approach estimates the return on debt as 'the average return that would have been required by debt investors in a benchmark efficient entity if it raised debt over an historical period prior to the commencement of a regulatory year in the regulatory control period'[189]. This reflects the forward-looking return on debt that would be incurred by the benchmark efficient entity for debt raised incrementally.

In practice, the return on debt produced by a benchmark debt portfolio with staggered maturity dates can be estimated as a trailing average of the total return on debt over a period spanning up to the start of the regulatory period (or regulatory year). The length of this period would be informed by the benchmark debt maturity.

The trailing average portfolio approach recognises that the lowest cost financing for the benchmark efficient entity may be to spread its borrowing requirements over a time period, thus reducing overall refinancing risk. Furthermore, this approach is consistent with the nature of regulated services. It reflects the need to finance investment in long-lived assets. A service provider can implement such a debt management strategy by holding a portfolio of fixed-rate debt with staggered maturity dates. It could also engage in some other financing practice and enter into hedging arrangements to replicate a borrowing cost structure that would arise if it held a portfolio of fixed-rate debt with staggered maturity dates.

The trailing average portfolio approach allows a service provider to manage interest rate risk arising from a potential mismatch between the regulatory return on debt allowance and the actual return on debt of a service provider without exposing itself to substantial refinancing risk.

## Hybrid portfolio approach

The hybrid portfolio approach incorporates elements from the 'on the day' and trailing average portfolio approaches. Under this approach, the estimate of the risk free rate roughly corresponds to the one derived under the 'on the day' approach (i.e. reflecting market conditions around the time of the determination). The DRP estimate roughly corresponds to the one derived under the trailing average portfolio approach (i.e. a long-term estimate). A service provider can implement such a debt management strategy by holding a portfolio of floating-rate debt with staggered maturity dates and using an interest rate swap overlay. It could also engage in some other financing practice that would result in the same borrowing structure.[190] We note that this approach relies on the assumption that the benchmark efficient entity would engage in hedging practices, for example, through entering into interest rate swap contracts.

Similar to the trailing average portfolio approach, the return on debt estimate under the hybrid portfolio approach reflects the forward-looking return on debt that would be incurred by the benchmark efficient entity for debt raised incrementally.

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[188] M.Lally, *Estimating the cost of debt of the benchmark efficient regulated energy network businesses*, 16 August 2013, p. 8.
[189] NER, cl. 6.5.2(j)(2) and cl. 6A.6.2(j)(2), NGR, r.87(10)(b).
[190] For example, it could hold a staggered portfolio of fixed-rate debt and enter into 'receive fixed' interest rate swap contracts at the time of debt issuance and then lock in the base rate at the beginning of the regulatory control period by using 'pay fixed' interest rate swaps.

The hybrid portfolio approach recognises that holding a portfolio of debt with staggered maturity dates is an efficient financing practice for both regulated and unregulated businesses. At the same time, it acknowledges that regulated network businesses function under a regulatory compact, and would align their debt financing practices with the adopted return on debt approach.

## Our preferred approach: overall considerations

Our preferred approach to estimation of allowed return on debt is the trailing average portfolio approach. As we state in section 6.3.2, our position is that the guideline should specify a single approach to estimating the return on debt for the benchmark efficient entity.

In the presence of refinancing risk, it is efficient for a service provider to hold a portfolio of debt with staggered maturity dates. The allowed return on debt under the trailing average portfolio approach reflects the financing cost of a benchmark efficient entity with such a staggered portfolio. Further, we consider the approach promotes productive, allocative, and dynamic efficiency of debt financing practices.

Specifically, for the approach to be productively efficient, it needs to provide incentives for service providers to seek the lowest cost debt financing. Other things being equal, any approach that sets an allowance ex ante would provide such incentives, as service providers are able to retain the benefits of 'beating' the regulator's estimate.

If a benchmark efficient entity holds a staggered debt portfolio, the expected required return on debt for any regulatory year can be computed as follows. It is a weighted average of the returns on debt issued prior to that regulatory year and the expected returns on debt issued during the regulatory year, where weights depend on the size of each particular issue. We discuss the choice of a weighting scheme and annual updating of the return on debt estimate in more detail in sections 6.3.6 and 6.3.5, respectively. Overall, we are satisfied that the chosen specification of the trailing average portfolio approach performs well in terms of minimising the potential difference between the return on debt allowance and the expected required return on debt of the benchmark efficient entity. Annual updating of the trailing average improves the match between the return on debt allowance and the expected required return on debt, as it allows the incorporation of newly revealed market information into the estimate more frequently. We consider this is consistent with the principle of allocative efficiency.

Dynamic inefficiency may exist if the actual return on debt (and equity) raised in a period is different from the return on debt (and equity) allowance for the period, as this difference may distort intertemporal investment and consumption decisions. In particular, the return on debt allowance below the actual return on debt might result in under-investment. On the other hand, if the return on debt allowance is above the required return on debt this may inefficiently lower energy consumption due to higher energy prices. Under a portfolio approach, movements in the market return on debt from year to year are reflected in the allowed return on debt. That is, for example, if a service provider with a $700 million RAB raises $100 million with a seven year maturity in year two of the regulatory period at a benchmark cost of 7.0 per cent, the incremental change in the trailing average for the return on debt will reflect the cost of its borrowings in that period. By reflecting market changes during the regulatory control period, the scope for sub-optimal investment and consumption levels is reduced. We discuss annual updating in section 6.3.5 and different weighting schemes in section 6.3.6. Overall, we are satisfied that the trailing average portfolio approach promotes dynamic efficiency.

To summarise, we are satisfied that the trailing average portfolio approach is consistent with the allowed rate of return objective and recognises 'the desirability of minimising any difference between

the return on debt and the return on debt of a benchmark efficient entity referred to in the allowed rate of return objective'.[191] Further, it provides service providers with incentives to engage in efficient debt financing practices and hence promotes overall efficiency of investment, operation and use of, electricity and natural gas services for the long term interest of consumers in a manner consistent with the NEO and NGO. Finally, the trailing average portfolio approach is capable of providing the benchmark efficient entity with a staggered debt portfolio with a reasonable opportunity to recover at least the efficient debt financing costs. This implies that a service provider with a similar degree of risk is also provided with the same opportunity. Thus, if the parameters of the trailing average are chosen to reflect the degree of risk that applies to the service provider in respect of the provision of regulated services, the trailing average portfolio approach is consistent with the NEL and NGL.

In addition to the considerations above, the trailing average portfolio approach provides the following benefits:

- It smooths movements in the return on debt over a number of years, which would result in lower price volatility for energy consumers and more stable returns for investors than the "on the day" approach.

- It minimises the consequences of a single measurement error.[192]

- It is more reflective of the actual debt management approaches of non-regulated businesses and, therefore, is more likely to represent efficient financing practice.

The majority of stakeholders supported the trailing average portfolio approach in their submissions to the consultation paper.[193] At the same time, the stakeholders expressed preferences regarding certain aspects related to implementation of the approach, such as annual updating, particular weighting schemes, benchmark term, presence of transitional arrangements, and so forth. We discuss these aspects in the relevant sections of the explanatory statement.

Further, some stakeholders submitted that the trailing average portfolio approach might not be the only approach that best reflects efficient financing practices of an energy network.[194] Finally, the ENA and Jemena submitted that some businesses might consider that 'a hybrid approach will better reflect their own efficient debt management practices' and that the trailing average portfolio approach 'has some material negative consequences for smaller network service providers'.[195] As we discuss in section 3.3.4, we propose not to use size as a part of the benchmark efficient entity definition. We discuss Jemena's submission in more detail further in this section.

Several stakeholders pointed out that the trailing average approach, results in lower volatility with respect to regulated revenues and energy prices from one regulatory period to the next.[196] The inter-period volatility is further reduced if the allowed return on debt is updated annually rather than through a retrospective NPV-neutral true up. At the same time, annual updating may result in some price

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[191]  NER, cl. 6.5.2(k)(1) and cl. 6A.6.2(k)(1); NGR, r.87(11)(a).
[192]  Since a larger number of observations are used to come up with the final estimate, a single measurement will have a smaller distorting impact on the overall estimate than with the short averaging period used for the "on the day" approach.
[193]  For example, see TransGrid, *Response to the consultation paper*, June 2013, p. 2; PIAC, *Submission to the consultation paper*, June 2013, pp. 30-31; ActewAGL, Response *to the consultation paper*, June 2013, p. 2; QTC, *Submission to the consultation paper*, June 2013, p. 3; NSW DNSP, *Submission to the consultation paper*, June 2013, p. 1; Envestra, *Submission to the consultation paper*, June 2013, p. 14; Citipower, Powercor and SA Power, *Response to the consultation paper*, June 2013, pp. 6-7; ENA, Response to the consultation paper, June 2013, pp. 6-7.
[194]  Citipower, Powercor and SA Power, *Response to the consultation paper*, June 2013, pp. 6-7.
[195]  ENA, *Response to the consultation paper*, June 2013, pp. 6-7; Jemena, *Submission to the consultation paper*, June 2013, p. 1.
[196]  TransGrid, *Response to the consultation paper*, June 2013, p. 3; QTC, *Submission to the consultation paper*, June 2013, p. 22; ENA, *Submission to the consultation paper*, June 2013, p. 6.

volatility within a regulatory control period. Consideration of consumer price volatility is an important factor, since the price volatility affects intertemporal decisions of energy consumers and hence affects the overall efficiency of economic outcome. In their submissions to the consultation paper consumer groups supported this proposition. PIAC submitted:[197]

> This choice is to forgo the prospect of some compensation for paying more than the efficient cost of capital (particularly cost of debt) in the previous regulatory period, and accept that the long-term interests of consumers lie in adopting a more stable and predictable trailing average /portfolio approach, that may:
>
> - reduce the volatility in network pricing both within and between regulatory periods;
>
> - therefore allow consumers and businesses to plan more effectively, with efficiency benefits for the broader community;
>
> - reduce the scope for gaming the regulator (and consumers); and
>
> - encourage the NSPs to focus on ways to perform better than the benchmark rather than ways to manipulate the benchmark.

While the EUAA submitted:[198]

> [The EURCC] proposal was that this would address the problem of volatile estimates of debt costs when sampled over a short period of time, and it would also address the problem of windfall gains and losses that arise when there are differences between the embedded and future costs of debt.

In the submission to the consultation paper, the NSW DNSPs state that ' [a]n additional benefit of the trailing average approach over the 'on the day approach' is that network businesses are actually able to implement the approach in practice'.[199] Similarly, the ENA points out that for the majority of service providers 'a trailing average better reflects what they (sic) businesses actually do and, for them, is more easily hedged than the alternative benchmarks' and hence, 'a trailing average has the potential to lower transaction costs'.[200] On the other hand, Jemena submits:[201]

> - NSPs like JEN and JGN with smaller debt portfolios are unable to issue debt evenly over the trailing average period (or use swaps to mimic this) – as is assumed by the benchmark – without facing extra financing costs and risks
>
> - NSPs like JEN and JGN with lumpy debt, which is more common among smaller NSPs, will struggle to transition their debt portfolios to mimic the trailing average benchmark – and any transition to this benchmark will further increase financing costs and risks for these NSPs
>
> - NSPs like JEN and JGN that are unable to mimic the trailing average benchmark effectively may have to adopt debt management practices that differ from those assumed for this benchmark – and so the incentives that these NSPs face may differ materially from the benchmark efficient NSP with unintended consequences, such as taking on extra exposure to interest rates in a way that undermines efficient investment in network assets.

And further:[202]

> If the AER were to adopt the trailing average benchmark, then these extra costs and risks should be compensated through higher cost of debt or equity allowances, or both – for instance, through a higher equity beta or lower credit rating. Otherwise, the affected NSPs will not have a reasonable opportunity to recover at least their efficient cost of funding…

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[197] PIAC, *Submission to the consultation paper*, June 2013, pp. 30-31.
[198] EUAA, *Response to the consultation paper*, June 2013, p. 12.
[199] NSW DNSP, *Submission to the consultation paper*, June 2013, p. 5.
[200] ENA, *Response to the consultation paper*, June 2013, p. 99.
[201] Jemena, *Submission to the consultation paper*, June 2013, p. 1.
[202] Jemena, *Submission to the consultation paper*, June 2013, pp. 1-2.

First, as we discuss in section 3.3.4, we do not consider that risks associated with difference in size of service providers should be rewarded through the allowed rate of return on capital. Thus, to the extent that Jemena is facing higher risks due to its smaller size, these risks should not be compensated through the rate of return allowance.

Second, as the EUAA points out:[203]

> …fundamentally, the specification of a regulatory control – whether for the cost of debt or equity, capex, opex or service standards can not be taken to imply that NSPs are required to run their businesses according to those controls. To the contrary regulatory controls establish incentives and NSPs have every reason to look for innovative ways to beat those controls. The regulator has no basis to suggest that an NSP should structure its operations to reflect regulatory benchmarks. If they have, that is a matter for them, and should not affect regulatory perspectives on the changes to regulatory methodologies. (…) there is no reason to believe that with a rolling average cost of debt, NSPs will necessarily issue debt to match the rolling average calculation.

Indeed, as long as the return on debt allowance is specified ex ante, service providers have the incentive to use debt financing practices in a way that allows them to seek least cost debt financing and manage their refinancing and interest rate risks. For example, the choice of the trailing average portfolio approach with uniform weights does not mean that a service provider has to issue an evenly spread staggered debt portfolio. A service provider is free to choose whatever debt financing practices it sees fit, given the incentives provided by the regulatory framework. For example, the QTC suggested a hedging strategy a service provider can implement in case it prefers to hold a portfolio of debt other than that of the benchmark efficient entity.[204]

The relevant question, then, is whether and to what extent would adoption of the trailing average portfolio approach distort investment decisions of smaller service providers like Jemena and thus, result in an inefficient outcome? Investment distortions can result from a mismatch between the allowed return on debt and the expected required return on debt of a service provider. We note that for the same benchmark definition both the trailing average portfolio approach and the hybrid portfolio approach (Jemena's preferred option) expose a service provider to similar interest rate risk with respect to the credit margin component of the rate of return. Then, the only source of a potentially higher mismatch is in relation to the base rate allowance. At this point we are not persuaded that Jemena provided enough supporting evidence that adoption of the trailing average portfolio approach would indeed result in significant distortion of its investment decisions. As noted by the QTC, firms such as Jemena, can implement financing strategies that allow them to achieve a level of consistency with the trailing average portfolio approach, if they so choose.

### 6.3.5 Annual updating

The rules allow for two options in designing the return on debt estimation methodology:[205]

1. The same estimate applies to each regulatory year within the regulatory control period.

2. The estimate can be (potentially) different for different regulatory years within the regulatory control period.

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203 EUAA, *Response to the consultation paper*, June 2013, p. 17.
204 QTC, *Moving average approach - detailed design issues: Supplementary submission to the economic regulation of network service providers rule change process*, 8 June 2012, pp. 7-8.
205 NER, cls. 6.5.2(i) and 6A.6.2(i); NGR, r. 87(9).

Under the trailing average portfolio approach, the first option implies that the trailing average is computed at the start of the regulatory control period and not updated until the next regulatory control period. The second option is consistent with the trailing average estimate being updated annually.

In the consultation paper we observed that the second option can be implemented either by annually updating the allowed revenue in each regulatory year of a regulatory control period, or via a retrospective (net present value-neutral) true up at the next determination. We also discussed advantages and disadvantages of each option and the implementation issues.[206]

In particular, we stated that the key concern regarding option one is that it may lead to mismatches between the benchmark efficient entity's return on debt during the regulatory control period and the rate of return on debt that is included in the building block allowance. This could create investment distortions for the benchmark efficient entity. The paper by the ACCC's Regulatory Development Branch (RDB) on the return on debt argues that the issue is partly resolved due to the inherent lagged self-correction mechanism that accounts for the changes in the return on debt at the next determination.[207] However, such self-correction does not take into account the time value of money.

On the other hand, option two minimises the mismatches between the benchmark efficient entity's return on debt and allowed return on debt during the regulatory control period. However, as we noted, it introduces additional complexity to the tariff computation (i.e. the CPI-X profile would need to be recalculated annually). Option two may also be more resource-intensive on both the AER and stakeholders. In addition, any difference between the benchmark rate of return on capital computed with and without annual updating becomes less significant if the benchmark debt tenor is long.

We emphasised that since we are required to apply annual adjustments in an automatic way, the decision on whether to use annual adjustments or not cannot be made without also considering the implementation issues.[208] Specifically, whether the return on debt is estimated using a third-party dataset (such as the ones produced by Bloomberg) or an AER-created dataset.

Further, we asked the stakeholders whether we should make annual adjustments to the return on debt.

There appears to be a divergence of views on the need for annual updating in submissions we received from consumer groups. Specifically, PIAC submitted:[209]

> Given the information provided to date, PIAC is of the view that the historical averaging approach with no annual updating of the rate of return achieves the best balance between (a) stability of investment and pricing over time and (b) the long-term interests of consumers for these low risk, long-life asset businesses.

The MEU submitted:[210]

> On balance the MEU considers that an annual adjustment does not add an onerous imposition, will provide a smoother price path, is more reflective of what occurs in the wider economy and reflects the aim that the allowed cost of debt should be as close as possible to the actual cost.

Finally, the EUAA submitted that 'this is an empirical issue' and noted 'the difference in the views set out by CEG (Tom Hird) and QTC (David Johnstone)', and concludes that it is 'not resolved on this specific issue'.[211]

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[206]   AER, *Rate of return consultation paper*, May 2013, p. 53-55, 113-14.
[207]   RDB, *Estimating the return on debt*, April 2013, pp. 30-35.
[208]   NER, cls. 6.5.2(i), 6.5.2(l), 6A.6.2(i) and 6A.6.2(l); NGR, rs. 87(9) and 87(12).
[209]   PIAC, *Submission to the consultation paper*, June 2013, p. 9.
[210]   MEU, *Response to the consultation paper*, June 2013, p. 44.

Submissions from industry stakeholders expressed a strong preference in favour of annual updating compared to both no annual updating and use of a retrospective true up.[212] Industry stakeholders submitted that:

- Without annual updating (either in every regulatory year or via a true up), there is likely to be a mismatch between the regulatory allowance and the return on debt of the benchmark efficient entity. This mismatch could potentially result in inefficient levels of investment. This problem would be exacerbated where there is a prolonged period of increasing / decreasing rates of return.[213]

- Use of a retrospective true up would potentially lead to higher volatility of consumer prices and revenues of service providers from one regulatory period to the next.[214]

- Use of a retrospective true up would result in high cash flow mismatches for service providers within a regulatory control period, which would flow through to equity holders.[215]

The overall position of industry stakeholders is summarised by the ENA:[216]

> Support for a trailing average approach is conditional on automatic updating both during any transitional period, and during following periods. Network businesses consider that the revenue and pricing volatility as well as cash-flow implications of a potentially significant mismatch between actual and benchmark costs arising from a lack of updating strongly suggest this approach is to be preferred. The ENA notes that the AEMC included a mechanism in the Rules to allow for automatic updating to occur.

The QTC and CEG provided quantitative studies as a follow-up to the return on debt workshop of June 3, 2013.

The aim of the exercise performed by CEG was to quantify 'the impact on revenue profiles of adopting a 'true up' at the end of the regulatory period rather than annual updating of the cost of debt during the regulatory period'.[217] CEG concluded that:[218]

> Application of a true up mechanism will significantly increase contribution made by changes in the cost of debt to the volatility of revenues and prices. This is because
>
> - the size of the true up itself can be material…;
>
> - the size and sign of the true up is strongly correlated with the size and sign of the natural change in the trailing average.

211   EUAA, *Response to the consultation paper*, June 2013, p. 8.
212   APIA, *Response to the consultation paper*, June 2013, p. 37; Citipower, Powercor and SA Power, *Response to the consultation paper*, June 2013, p. 7; ENA, *Response to the consultation paper*, June 2013, p. 100; Envestra, *Submission to the consultation paper*, June 2013, p. 10; NSW DNSP, *Submission to the consultation paper*, June 2013, pp. 6-7; QTC, *Submission to the consultation paper*, June 2013, p. 17; SP AusNet, *Submission to the consultation paper*, June 2013, pp. 2-3; TransGrid, *Response to the consultation paper*, June 2013, Attachment p. 3.
213   NSW DNSP, *Submission to the consultation paper*, June 2013, pp. 6-7; Citipower, Powercor and SA Power, *Response to the consultation paper*, June 2013, p. 7; ENA, *Submission to the consultation paper*, June 2013, p. 100; SP AusNet, *Submission to the consultation paper*, June 2013, pp. 1-2; QTC, *Submission to the consultation paper*, June 2013, pp. 2-3, 8, 17.
214   NSW DNSP, *Submission to the consultation paper*, June 2013, p. 7; Envestra, *Submission to the consultation paper*, June 2013, p. 10; Citipower, Powercor and SA Power, *Response to the consultation paper*, June 2013, p. 7; ENA, *Submission to the consultation paper*, June 2013, p. 7; TransGrid, *Response to the consultation paper*, June 2013, Attachment p. 3; SP AusNet, *Submission to the consultation paper*, June 2013, p. 3; APIA, Response *to the consultation paper*, June 2013, p. 37; QTC, *Submission to the consultation paper*, June 2013, p. 2.
215   Citipower, Powercor and SA Power, *Response to the consultation paper*, June 2013, p. 7; ENA, *Submission to the consultation paper*, June 2013, pp. 7, 100; SP AusNet, *Submission to the consultation paper*, June 2013, p. 2.
216   ENA, *Response to the consultation paper*, June 2013, p. 7.
217   CEG, *Impact of annual updating on revenue smoothing, Memorandum*, 17 June 2013, p. 1.
218   CEG, *Impact of annual updating on revenue smoothing, Memorandum*, 17 June 2013, p. 6.

The QTC submitted 'the results of simulation analysis that quantifies the potential mismatch between a portfolio cost of debt that changes annually and a benchmark return on debt without annual updates or a true-up at the end of each 5-year regulatory period'.[219] The QTC's conclusion was:[220]

> Based on the simulation results, a service provider could expect to experience annual mismatches of between ± 76 basis points if the return on debt is not updated annually. The annual mismatches are positively correlated and there is also a slight positive correlation in the average mismatch across consecutive 5-year periods.
>
> The mismatches based on actual interest rate data are larger than the simulated mismatches and display a much higher level of persistence over time. These results demonstrate that large cumulative mismatches can occur during trending interest rate environments.
>
> …In QTC's view, not making annual adjustments to the benchmark return on debt will significantly diminish the benefits of a portfolio approach, create unnecessary risks for consumers and service providers, and will produce outcomes that are inconsistent with clause 6.5.2(k)(1) of the Rules.

Both studies, at least in part, make use of the Moody's Seasoned Baa US Corporate Bond yield data available from the Federal Reserve Bank of St. Louis. The data series span from 1919 to present. We understand that the choice of this data sample was due to the lack of long Australian data series suitable for similar analysis. However, we note that the resulting quantitative estimates should be interpreted with caution. Specifically, since the early 1900s, the US monetary policy has undergone significant changes. It should be recognised that monetary policy influences the inflation rate and nominal rate of return on debt. For example, it is not surprising that mismatches between the rate of return on debt and regulatory allowance computed without annual adjustment would be persistent and substantial in a prolonged period of high inflation. However, it is not clear if this observation is of direct relevance to the current domestic capital market that functions under inflation targeting.

With respect to the simulation analysis performed by the QTC, the outcomes are based on modelling assumptions regarding short term movements in interest rates. Specifically, we note that the Brennan-Schwartz model is not the only single-factor theoretical model describing short-term interest changes. Therefore, we consider that its estimation should be coupled with tests of alternative model specifications. Thus, again, we consider that the results of the simulation analysis should be interpreted with caution. Nevertheless, we consider that the two studies suggest that annual updating may be in some circumstances preferable to no annual updating or a retrospective true up. This is particularly the case where there are prolonged periods of increasing or decreasing rates of return on debt and when the return on debt displays significant autocorrelation.

We propose the use of a third-party data service provider to estimate the allowed return on debt. We consider that in this case, on balance, the advantages of annual updating outweigh the associated additional resource requirement and other potential disadvantages, such as potentially higher volatility of consumer prices within a regulatory control period. Therefore, we propose to update the allowed return on debt estimate in each regulatory year of a regulatory control period. The draft guideline outlines the annual updating process.

## 6.3.6 Weighting

As the term suggests, the trailing average estimate of the return on debt is a weighted average of individual rates of return on debt within a certain time period. The choice of individual weights depends on the assumptions we make about the efficient financing practices and debt profile of the benchmark efficient entity. If we assume the benchmark efficient entity issues debt uniformly over

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[219] QTC, *Submission to the consultation paper*, June 2013, pp. 29-38.
[220] QTC, *Submission to the consultation paper*, June 2013, p. 36.

time in tranches of equal size (i.e. the debt balance remains constant over time), it is reasonable to apply equal weights. That is, for a benchmark term of seven years, a weight of 1/7 would be given to each year in the trailing average.[221] We refer to such a weighting scheme as simple (unweighted) average. If the benchmark efficient entity has an increasing (or decreasing) debt balance, using a simple trailing average might result in a mismatch between its return on debt and the allowed return on debt. This mismatch might distort investment decisions.

In the consultation paper, we considered the following alternatives to simple trailing average suggested by stakeholders:[222]

- weights based on the actual debt issuance data

- weights based on the actual changes in RAB, adjusted by the benchmark gearing

- weights based on the debt issuance assumptions in the Post Tax Revenue Model (PTRM)

We noted that these approaches raise the following set of concerns:

- All three approaches imply that the weights used in a trailing average would be different for each individual service provider. As such, this represents a departure from the benchmarking approach and the allowed rate of return objective.

- Weighting schemes based on actual data (the first two approaches) may not provide a service provider with incentives to minimise its return on debt and, therefore, to engage in efficient financing practices.

- The third approach may also lead to investment distortions. During the regulatory control period, a service provider minimising its return on debt might choose not to follow the debt issuance profile assumed in the PTRM. For example, it might choose to postpone investment if the prevailing rate of return on debt is high. However, the incentive to delay the investment would be weaker if a trailing average based on the PTRM assumptions is used. This outcome is not desirable, since it would lead to financing practices that are unlikely to be efficient.

We considered that, on balance, a simple trailing average would provide a better incentive for service providers to seek efficient financing. It is also computationally and conceptually simple. In addition, if the changes in the debt balance are small relative to overall debt balance, a simple trailing average is a good approximation of a trailing average based on the benchmark debt profile. Therefore, we expressed our preference in favour of a simple trailing average should we decide to adopt a portfolio approach.

The majority of submissions to the consultation paper did not discuss the appropriate weighting scheme. The ENA submitted that it 'currently does not have a firm position' on this issue.[223] The NSW DNSPs and two consumer groups, the MEU and PIAC supported the use of a simple trailing average. In particular, NSW DNSPs submitted:[224]

> …weighting each year's cost of debt estimate based on actual or forecast debt issued in that year results in greater chance of estimation error. A simple equal weighted average reduces the risk of estimation error when setting the allowed cost of debt.

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[221] See section 7.3.3 for further detail on the proposed benchmark term of debt.
[222] AER, *Rate of return consultation paper,* May 2013, pp. 111–113.
[223] ENA, *Response to the consultation paper*, June 2013, p. 101.
[224] NSW DNSP, *Submission to the consultation paper*, June 2013, p. 7.

The MEU noted that the weights based on forecast data 'might provide a more accurate forecast of the total cost of debt, but it also provides the opportunity to game the process, introduce debates as to what the forecast debt profile might be and therefore what weightings should be used'[225]. Further, the MEU commented:[226]

> In practice, actual capex varies from forecasts anyway, but the actual impact of capex in relation to the overall debt portfolio is relatively small – annual capex as a proportion of RAB usually lies in the range of 5-15%, so variations in capex will have a marginal impact

PIAC submitted that weighting of the components of trailing average 'would be seeking a level of precision in the outputs that is not warranted by the accuracy of the inputs and the models' and that:[227]

> In addition, it appears that the weighting would be based on the forecast profile of capital expenditure. However, the NSP has no obligation to actually invest capital in accordance with that profile, and the weightings could open the door to further gaming of the actual investment profile—an outcome that should be avoided.

At the same time, the APIA noted that '[i]t is simply not the case that firms adopt a[n] even weighting of the same sized tranche of debt each year…or indeed any other weighting' and that:[228]

> …the AER would need to show that the only reason why different firms have different weights to their tranches of debt is because they are inefficient. Failure to do so would render the AER in breach of rule 87(2) of the NGR, because it would leave open the possibility that different weights merely reflect different risk profiles at the relevant firms.

We do not agree that using one set of weights to compute the allowed return on debt for different service providers would breach the allowed rate of return objective. The allowed rate of return should 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 respect of the provision of reference services'.[229] We consider that using one benchmark definition is appropriate. Therefore, using one set of weights is consistent with the allowed rate of return objective, as long as the resulting estimate is commensurate with efficient financing costs of the benchmark efficient entity.

Finally, the QTC submitted that a weighted trailing average, where ' the borrowings made to fund the debt portion of new capital expenditure [are] compensated at the prevailing 10-year cost of debt' is 'consistent with benchmark regulation'.[230] The QTC considered that 'this will reduce the potential for investment distortions in the long-term interests of consumers'.[231] Further:[232]

> To the extent that service providers can adjust their expenditure and borrowing profile or enter into forward interest rate contracts in response to differences between prevailing and long-term interest rates, under a simple average approach service providers could derive significant windfall gains at the expense of consumers.

We recognise that the use of a simple trailing average might result in a mismatch between the return on debt allowance and the expected required return on debt of a service provider. In particular, this might be the case if the service provider's debt balances are increasing and the prevailing rate is

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[225] MEU, *Response to the consultation paper*, June 2013, p. 42.
[226] MEU, *Response to the consultation paper*, June 2013, p. 43.
[227] PIAC, *Submission to the consultation paper*, June 2013, p. 33.
[228] APIA, *Response to the consultation paper*, June 2013, pp. 34–35.
[229] NGR, r. 87(3).
[230] QTC, *Submission to the consultation paper*, June 2013, p. 1.
[231] QTC, *Submission to the consultation paper*, June 2013, p. 1.
[232] QTC, *Submission to the consultation paper*, June 2013, p. 1.

different from the simple trailing average. However, we are not persuaded that this mismatch would be material.[233]

In addition, we agree with PIAC's point that the service providers might not (and indeed, often do not) follow their forecast PTRM profile—sometimes for reasons outside of their control. In this case, using PTRM-based weight is not guaranteed to narrow the mismatch.

Further, we maintain that return on debt allowance that relies on the historical value of a parameter that the service provider can influence (such as debt balances and capex) is not consistent with incentive-based regulation. In addition, the weighting based on the actual changes in RAB is flawed. This is because a constant RAB does not imply zero debt issuance (due to depreciation and potential changes in debt-to-equity ratio). Finally, the weighting based on the actual changes in RAB (or, for that matter, any historical values) would need to be implemented via a retrospective (NPV-neutral) true up. This would increase the complexity of the estimation process.

Overall, we consider that we should adopt a simple trailing average.

### 6.3.7 Transitional arrangements

In this section we discuss whether transitional arrangements are warranted in moving to a trailing average.

#### Background

Our decision to adopt the trailing average approach as the only approach to estimation of the allowed return on debt raises a question of whether we need a transition to move away from the 'on the day' approach. An alternative would be to apply the trailing average approach to service providers immediately at the start of their new regulatory control period.

The amended rules allow us to apply a transition if considered appropriate. The rules state that in estimating the return on debt regard must be had to the following (transition) factor:[234]

> ...**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... [emphasis added]

We note that the term 'any impact' allows us to address a wide range of concerns. The AEMC in its reasons accompanying the final rule determination stated that the purpose of this factor was:[235]

> The purpose…is for the regulator to have regard to the impacts of changes in the methodology for estimating the return on debt from one regulatory control period to another. Consideration should be given to **the potential for consumers and service providers to face significant and unexpected change in costs or prices** that may have negative effects on confidence in the predictability of the regulatory arrangements. [emphasis added]

The AEMC then further stated:[236]

> Its purpose is to allow consideration of transitional strategies so that any **significant costs and practical difficulties** in moving from one approach to another is taken into account. [emphasis added]

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[233] See appendiX l for analysis of materiality.
[234] NER, cls. 6.5.2(k)(4) and 6A.6.2(k)(4); NGR, r. 87(11)(d).
[235] AEMC, *Final rule change determination*, 29 November 2012, p. 85.
[236] AEMC, *Final rule change determination*, 29 November 2012, p. 85.

In the consultation paper we specified that we do not support the notion that transitional arrangements should be specific to individual service providers' debt financing practices.[237] Such an approach would be inconsistent with the allowed rate of return objective and represent a break from the fundamentals of incentive-based regulation.

We also pointed out that we would seek any transition to take place over the shortest period that is appropriate, preferably no longer than a single regulatory control period. We also said we would not expect transition to occur more than once for each service provider, unless we were to change the approach to estimating the return on debt again in future guidelines.

We suggested that one of the key considerations in deciding on whether a transition is required is the impact of the change of approach on the service provider's expected cash flows in the PRTM, and on the allowed revenue profile. For instance, in its report to the AEMC, SFG stated that if a rule change was not accompanied by transitional arrangements:[238]

> …it may be viewed by the market for funds as a signal that a higher degree of regulatory risk should be priced into their provision of funds, and the AEMC would have to consider whether that would be consistent with the NEO and RPP.

The consumer group submissions to the consultation paper demonstrate a variety of views on transition, ranging from the view that no transition is required to the view that the service providers should not be compensated for any costs associated with moving to a new approach to estimating the return on debt.[239] Overall, the energy consumer groups do not appear to have a preference in favour of transition.

The EUAA discussed the arguments presented to date by the AER, ACCC, QTC, and other stakeholders during the consultation process and concluded that:[240]

> …the arguments in favour of transition arrangements are not robust, and accordingly we see no need for such arrangements.

The MEU submitted that:[241]

> Whilst there are some regulatory activities that do require a transition, the MEU does not see a transition program is need for a change in the setting of the cost of debt…In contrast, if the change was to be from a trailing average approach to an "on the day" approach, the MEU would consider that there is a need for a transition as the risk increases for NSPs

Finally, PIAC suggested that various approaches to transition:[242]

> …need to be critically examined to assess if the benefits to NSPs and consumers of a transitional approach significantly outweigh the complications of various approaches to transitioning.

Further, PIAC submitted that:[243]

> …it is essential that any transitional arrangements recognise that the current position unduly rewards NSPs for the cost of capital, as seen in the above average returns to shareholders (including state government shareholders) over the past few years. As highlighted previously, there is no need, in terms of financial

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[237]   AER, *Rate of return consultation paper, May 2013*, p. 115.
[238]   SFG Consulting, *Rule change proposals relating to the debt component of the regulated rate of return*, Report to the AEMC, 21 August 2012.
[239]   MEU, *Response to the consultation paper*, June 2013, p. 44; PIAC, *Submission to the consultation paper*, June 2013, p. 31; EUAA, *Response to the consultation paper*, June 2013, pp. 8, 12, 15–17.
[240]   EUAA, *Response to the consultation paper*, June 2013, p. 15.
[241]   MEU, *Response to the consultation paper*, June 2013, p. 44.
[242]   PIAC, *Submission to the consultation paper*, June 2013, p. 5.
[243]   PIAC, *Submission to the consultation paper*, June 2013, p. 31.

resilience of the NSPs, to compensate the NSPs for costs or loss of expected earnings from this transition. If consumers have foregone lower prices in the past as a result of the regulatory framework, it is unreasonable to expect consumers to incur additional costs going forward as a result of the change in the regulatory framework. [emphasis added]

On the other hand, the industry group submissions to the consultation paper show that there is no agreement among the industry stakeholders on whether transition is needed and, if so, whether it should be specific to service providers' individual circumstances or not.

In their submissions to the consultation paper several service providers stressed that transitional approach should take into account individual circumstances of businesses and, in particular, their debt financing practices. For instance, the ENA submitted that:[244]

> …the purpose of transitional arrangements is to provide a mechanism (or mechanisms) to ensure that businesses are **able to meet their new regulatory obligations and have the opportunity to recover at least their efficient costs**. The ENA considers that any transition arrangements need to be **fair and reasonable**. This may require the AER to take into account the **individual circumstances** of the business in question and, in some circumstances, **it may be that no transition is required if the business already uses a debt financing approach consistent with the efficient benchmark** or this is the best way of facilitating a business to hedge its efficient interest costs to the regulatory allowance. [emphasis added]

The APIA submitted:[245]

> Transitional approach should be based on the simple proposition that it **should emulate what a business would do if it was moving from one approach to debt financing to another**, with the proviso that different firms may adapt in different ways (**depending upon individual circumstances**) and still be efficient; we can see no reason to insist on one transition approach. This would preserve the benchmark efficient firm requirement and would inherently preserve the incentive properties required by the NGR. [emphasis added]

Further, some service providers stressed that their individual circumstances and debt financing practices are such that no transition would be required.[246] For instance, TransGrid submitted that:[247]

> TransGrid's current debt management practice is already consistent with the benchmark efficient portfolio approach and therefore only an immediate cutover would be appropriate.

> Any other form of transition has the potential to create a significant mismatch between the efficient debt management practices of network businesses like TransGrid and the regulatory benchmark approach. It would also have the effect of distorting investment decisions.

With respect to the above submissions, we consider that a transition tailored to the debt financing practices of individual service providers would be inconsistent with the allowed rate of return objective and represent a break from the fundamentals of incentive-based regulation.

Other submissions from service providers suggested a transition method would need to satisfy general criteria that do not rely on individual debt financing practices.[248] For example, the QTC suggested that:[249]

> …transitional arrangements could be put in place **to manage any impact on the benchmark efficient entity and consumers** arising from the change in the approach. [emphasis added]

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[244]   ENA, *Submission to the consultation paper*, June 2013, pp. 101–102.
[245]   APIA, *Response to the consultation paper*, June 2013, p. 37.
[246]   Envestra, *Submission to the consultation paper*, June 2013, p. 16; TransGrid, *Response to the consultation paper*, June 2013, pp. 3–4; NSW DNSP, *Submission to the consultation paper*, June 2013, pp. 1, 7–9.
[247]   TransGrid, *Response to the consultation paper*, June 2013, p. 3.
[248]   QTC, *Submission to the consultation paper*, June 2013, p. 1; SP AusNet, *Submission to the consultation paper*, June 2013, pp. 4–5.
[249]   QTC, *Submission to the consultation paper*, June 2013, p. 1.

The QTC submitted that the approach it previously outlined:[250]

> …would allow a service provider **to transition from a strategy that aimed to minimise interest rate risk under the 'on the day' approach** to transition to the portfolio approach. Under this approach…there would be no short term impact on consumers. [emphasis added]

Further, while Jemena expressed a preference for the hybrid portfolio approach, Jemena submitted that a transition would be needed if the trailing average portfolio approach is adopted:[251]

> Importantly, Jemena supports a transition mechanism with annual tariff updates if the trailing average were applied. Both are needed to ensure that **the efficient debt management practices assumed in the current (rate on the day) benchmark are fairly transitioned to the new (trailing average) benchmark**. [emphasis added]

Further, SP AusNet submitted that an appropriate transition path:[252]

- Should compensate businesses consistent with NER 6.5.2(c). Note that this refers to 'efficient financing costs of a benchmark efficient entity'.

- Should **avoid large step changes in prices** as this could create problems for customers to manage.

- Should **maximise certainty** for customers and businesses (consumers interested in certainty over prices so they can plan for changes, and businesses interested in certainty of cash flows). [emphasis added]

SP AusNet also stated that:[253]

> SP Ausnet also recognises the AER's concern around transitioning from existing business practice leading to multitude of transition paths. Therefore, a **pragmatic approach**, recognising both the current benchmark and efficient financing principles, is required to satisfy the criteria above. The transition path outlined by QTC is an example of such a pragmatic approach…This approach will not result in windfall gains or losses for either network businesses or customers, and uses forward looking data only. [emphasis added]

## Overall considerations

As outlined above, the AEMC's reasoning for us to consider whether a transitional arrangement is necessary in moving from the current 'on-the-day' approach to the trailing average portfolio approach focuses on the potential for:

- stakeholders to face significant and unexpected change in costs/prices

- practical issues that may arise from moving to another approach for estimating the return on debt

We consider that the AEMC's reasoning provides us with some guidance regarding important considerations for determining whether a transitional arrangement is required. Further, we agree that an appropriate transition path should satisfy the criteria suggested by SP AusNet (listed above). In forming our position, we have also taken into account the considerations submitted by the QTC, PIAC, and Jemena.

Overall, we consider that there should be a transition from the 'on the day' approach to the trailing average portfolio approach. Consistent with the first bullet point above, we consider a transition is necessary to provide a gradual adjustment to the change of approach to the allowed return on debt estimation. This would accommodate any potential discrepancy between the new approach to

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[250] QTC, *Submission to the consultation paper*, June 2013, p. 26.
[251] Jemena, *Submission to the consultation paper*, June 2013, p. 32.
[252] SP AusNet, *Submission to the consultation paper*, June 2013, p. 4.
[253] SP AusNet, *Submission to the consultation paper*, June 2013, pp. 4–5.

estimating the return on debt and reasonable expectations consumers, service providers, and investors formed before the rule change.

In particular, unexpected and immediate changes in approaches to setting allowances for the return on debt can be disruptive to both businesses and consumers (to the extent that they may result in significant changes in energy prices and cash flows compared to the expected levels). Appropriate, gradual changes to the regulatory framework may be more desirable. For instance, under the 'on the day' approach energy consumers reasonably expected energy prices to be volatile from one regulatory control period to the next. In particular, to the extent that the prevailing market rate of return on debt is mean-reverting, consumers would expect that if they face higher than average energy prices today, they would face lower that average prices in the future.

The reasonable expectations of the consumers would not be met if a switch to the trailing average portfolio approach were implemented without a transition. A transition can allow for more gradual adjustment to the change in regulatory approach. The same logic, of course, also applies to the reasonable expectations formed by service providers.

We have also had regard to practical considerations. Without a transition, we would need to estimate the trailing average of the return on debt for each service provider at the commencement of the next regulatory control period. Some elements of the average would be based on historical data that might not be readily available, depending on the choice of a specific third-party data set. We would also need to reach an agreement with each service provider on the averaging periods for historical data where there is no transition. In this case, a service provider may prefer the averaging periods that deliver the highest estimates of the past rates of return. A transition that does not use historical data would avoid this issue.

Finally, as we discussed earlier, there is a concern that, given the guideline is not binding, service providers would seek to switch from one return on debt approach to another and back at the time of their determinations, depending on which approach provides them with the highest return on debt. The implementation of a transitional arrangement may deter a service provider from seeking to opportunistically switch between approaches given this would require a further transitional arrangement. Any further transitional arrangement would delay the full commencement (and any 'windfall gains' received by the service provider) of any new approach to the return on debt. Any transitional arrangement where only forward-looking data is used to estimate the return on debt allowance would be effective in deterring service providers from gaming in this manner.

We consider that a single approach to estimating the return on debt and a single definition of the benchmark efficient entity goes some way to addressing this concern. In particular, we propose specifying one approach in the draft guideline. Therefore, a service provider would need to provide a compelling case to move away from the approach adopted in the guideline.

We maintain our position expressed in the consultation paper that a transition tailored to the debt financing practices of individual service providers would be inconsistent with the allowed rate of return objective and represent a break from the fundamentals of incentive-based regulation.

On balance we support a single transitional arrangement (and a single method) in moving to the trailing average return on debt to apply to all service providers. This is based on the following considerations:

- providing a gradual transition to the trailing average approach given a possible change in prior expectations regarding the regulatory framework by stakeholders

- practical considerations regarding use of historical information (and possible agreement) to calculate the return on debt

- minimising potential gaming opportunities for service providers.

We consider that the 'QTC method' of transition, modified to be consistent with the benchmark tenor of seven years and simple weighting, addresses all of the objectives specified above. In addition, the 'QTC method' received the most support from stakeholders throughout the guideline process. We provide details on the 'QTC method' below.

## The 'QTC method'

The QTC described its approach to transition in its supplementary submission during the AEMC rule change process:[254]

> Under this rule, at the time the NSP elects to use the moving average approach, the prevailing rate during the next rate reset period will apply for the first year. In the second year, the first year rate will in effect have a 90% weighting, absent any increases in debt which affect the weighting, and that weighting will diminish by 10% each year. Based on a ten year averaging period and quarterly observations, this is equivalent to setting the initial forty observations in the moving average to equal the average prevailing rate during the next rate reset period.

The same idea can be applied in case of a seven-year benchmark tenor with minor modifications.

In particular, we assume that the benchmark efficient entity refinances / issues the entirety of its debt portfolio in the beginning of the first year of the transition. Thus, the allowed return on debt in the first year is the prevailing rate.

In the second year, the benchmark efficient entity retires one-seventh of its debt and replaces it by newly issued seven-year debt. Then, the allowed return on debt is a weighted sum of the prevailing rates in the first and second years (with weights of 6/7 and 1/7, respectively). In the third year, the benchmark efficient entity retires another one-seventh of the debt it issued in the first year and replaces it with newly issued seven-year debt.

In the seventh year, the benchmark efficient entity replaces another one-seventh of the original debt issued in the first year with newly issued seven-year debt. The allowed return on debt in the seventh year is an equally weighted (with weights of 1/7) sum of the prevailing rates in the seven years of transition. At this stage the transition is complete.

Refer to appendix J for illustration of this transitional approach.

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[254] QTC, *Moving average approach - detailed design issues: Supplementary submission to the economic regulation of network service providers rule change process*, 8 June 2012, p. 2.

# 7 Return on debt: implementation

This chapter deals with the implementation issues related to return on debt estimation. Sections 7.1 and 7.2 present the issue and the approach we propose in the guideline. Section 7.3 elaborates on the reasoning for the proposed approach.

## 7.1 Issue

In the consultation paper we sought views regarding implementation issues for estimating the return on debt. Specifically, we need to make decisions on the following matters:

- Whether to use a third party data service provider (such as Bloomberg) or produce an estimate in-house.

- Inputs to estimate the return on debt, these include the benchmark term of maturity of debt and credit rating.

## 7.2 Proposed approach

After further consideration of the issues and submissions to the consultation paper, we propose to:

- use an independent third party data service provider

- use an averaging period of 10 or more consecutive business days from published yields to estimate the prevailing return on debt

- assume a benchmark credit rating of BBB+ or its equivalent and a benchmark term of debt of seven years.

## 7.3 Reasoning

In the consultation paper, we sought stakeholder views on whether to use a third party data service provider or produce a dataset in-house to estimate the return on debt. We also sought views on the assumed credit rating and average term of debt.

Each of these issues is discussed in turn below.

### 7.3.1 Third party data service provider

The return on debt could be estimated either by reference to an estimate developed by a third party dataset service provider, or by an AER in-house method. We currently use the BBB seven year Bloomberg fair value curve (FVC), extrapolated to a 10 year maturity (based on a benchmark credit rating of BBB+ and a 10 year term to maturity).

We are proposing to estimate the return on debt using a third party data service provider. We consider that using a third party data service provider has the following advantages:

- Third party data sources are provided for use by market practitioners and developed independently from the regulatory process.[255]

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[255] APIA and ENA supported this view see APIA, *Submission to the Consultation Paper*, June 2013, p. 37; ENA, *Submission to the Consultation Paper*, June 2013, pp. 95–98.

- This data source has been constructed by experts with access to a comprehensive financial database, where judgements are made in terms of debt selection and any necessary adjustments to yields.

- Using an independent third party also reduces the scope for debate on debt instrument selection issues and curve fitting or the use of some form of averaging methods to derive the estimate of the return on debt. In particular, if we used an in-house method, we would need to develop and apply:

  - detailed criteria for selecting debt instruments with appropriate specification of contingencies to allow automatic updating.

  - a detailed description of the estimation method (that is, curve fitting technique or some form of averaging observed yields—for example, Nelson–Siegel, Svensson or spline based approaches).[256]

- It can be more readily implemented in the context of automatically updating a trailing average of the return on debt as required by the NER/NGL (see chapter 6).

In general service providers supported the continued use of the Bloomberg FVC.[257] In particular, some submissions supported the use of a third party dataset on the basis that the source of data should be independent from the regulatory process and expert.[258]

Submissions also raised issues around the complexity of constructing a yield curve in the event that an AER dataset was used to estimate the return on debt.[259]

In addition to added complexity in specifying the exact formula for its implementation, the adoption of an in-house approach requires us to invest considerable additional resources. This would require the development and maintenance of the AER dataset on a regular basis. A number of issues would arise requiring the exercise of judgement, including the need to:

- perform regular downloads of debt data satisfying the selection criteria (possibly selecting from several data sources, including Bloomberg and UBS)

- maintain data on historical credit ratings (sourced from Bloomberg or rating agencies)

- perform regular downloads of interest rate swap rates (and exchange rate swap rates) and convert the yields on floating rate notes and foreign currency bonds into fixed-rate AUD yields (depending on whether floating rate notes and foreign currency bonds are used in the dataset, respectively)

- adjust the observed yields on the embedded options for callable bonds if considered necessary

- periodically consult market experts on whether the selection criteria need to be adjusted for changes in market conditions.

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[256] M. Lally, *Estimating the cost of debt of the benchmark efficient regulated energy network business*, 26 June 2013, pp. 17–18.

[257] APIA, *Submission to the Consultation Paper*, June 2013, p. 37; CitiPower et al, *Submission to the Consultation Paper*, June 2013, p. 8; ENA, *Submission to the Consultation Paper*, pp. 95–98; Envestra, *Submission to the Consultation Paper*, June 2013, p. 14.

[258] APIA, *Submission to the Consultation Paper*, June 2013, p. 37; ENA, *Submission to the Consultation Paper*, June 2013, pp. 95–98.

[259] Envestra, *Submission to the Consultation Paper*, June 2013, p. 14.

At the same time while we propose to rely on a third party data service provider such as Bloomberg for the estimation of return on debt, we acknowledge the known issues with this dataset or potential issues with using a third party dataset. In particular:

- the third party data service provider may stop publishing data[260]

- the third party data service provider may stop publishing the data at maturities and/or credit ratings that are consistent with the definition of the benchmark efficient entity[261]

- the methodology used by the third party data service provider may not be shared publicly thus reducing transparency and making it harder to identify any divergences between the estimates derived from this source and the return on debt of the benchmark efficient entity

- the lack of transparency around the methodology may also reduce confidence in the consistency of estimates over time and between different points on the curve.

## Availability of third party data service providers

At this time, Bloomberg is the only independent third party data service provider that publishes a FVC since CBA Spectrum ceased publishing. We note ENA's submission that Bloomberg does not produce its FVC specifically with the rules in mind. This is both an advantage (in terms of the independence of the Bloomberg estimate from any single stakeholder) and a disadvantage (in terms of failing to include bond data that may be relevant to the benchmark efficient entity). In the ENA's opinion, when the advantages and disadvantages of using Bloomberg FVC are weighed against each other the Bloomberg FVC remains the best source of an estimate of the benchmark cost of debt.[262] PIAC also support the continued reliance on Bloomberg to estimate the return on debt.[263]

Other submissions in support of an AER developed dataset and estimation technique agreed with the issues with Bloomberg FVC outlined in consultation paper and also noted that:

- to address the risk that Bloomberg ceases to produce seven year BBB FVC, the best way is to develop a yield curve-fitting method based on the Nelson-Siegel yield curve model[264]

- the Bloomberg FVCs are not representative of the credit rating of service providers and require both extrapolation and interpolation.[265]

As discussed in our consultation paper, there are known issues with relying on Bloomberg FVC. We consider that the issue of the Bloomberg FVC over or under-estimating the regulated service providers return on debt becomes less problematic when the return on debt is estimated using a portfolio approach, such as the adoption of a trailing average of a portfolio of debt. This is because the approach estimates the return on debt as an average of a number of Bloomberg FVC estimates. The process of averaging may result in periods where the Bloomberg FVC over-estimates the benchmark return on debt being offset by periods where the Bloomberg FVC under-estimates the return on debt. The QTC submitted that using a portfolio approach to calculate the return on debt

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[260] We previously considered CBA Spectrum dataset. However, it ceased publishing its estimates of fair yield curves across all credit ratings for Australian corporate bonds in September 2010.

[261] Bloomberg had ceased providing yield estimates beyond 7 years from 18 August 2009. In addition, the Bloomberg only publishes its estimated fair yield curves for broad rating categories. The definition of the benchmark efficient entity might refer to a specific rating notch.

[262] ENA, *Submission to the consultation paper*, June 2013, pp. 96–97.

[263] PIAC, *Submission to the Consultation Paper*, June 2013, p. 35.

[264] QTC, *Submission to Consultation Paper*, June 2013, pp. 12–13.

[265] MEU, *Submission to the Consultation Paper*, June 2013, p. 45.

should alleviate any concerns regarding the perceived quality of the Bloomberg FVC when calculating an average return on debt over a 10 year period.[266]

Figure 7.1 indicates that under the current 'on-the-day' approach the Bloomberg FVC over or under-estimates the return on debt at any given point in time by sometimes a significant amount. This is a concern if the return on debt is estimated at a point where Bloomberg FVC diverges from selected bond sample yields.

**Figure 7.1      Spreads between BBB 5 year BFV and average yield on bonds with maturity of 3 to 7 years and BBB band credit rating**
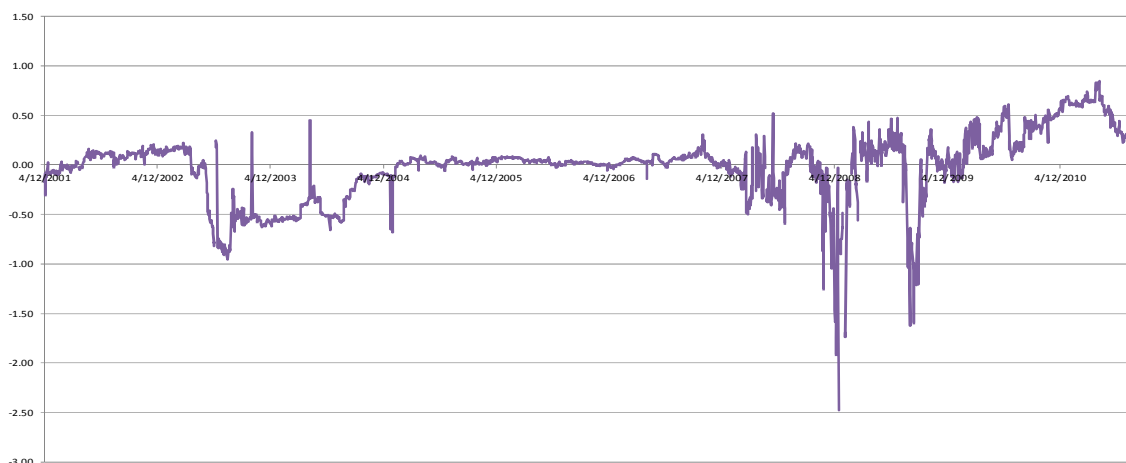


Source:    Smyczynski and Popovic, *Estimating the Cost of Debt: A Possible Way Forward*, Regulatory Development Branch, Australian Competition and Consumer Commission, April 2013, p. 44.

However, as outlined in figure 7.2 using an average in the portfolio approach, results in periods of over estimation being offset by periods of under estimation.

**Figure 7.2      Spreads between 5 year annual average BBB 5 year BFV and 5 year annual average of the average yield on bonds with maturity of 3 to 7 years and BBB band credit rating**
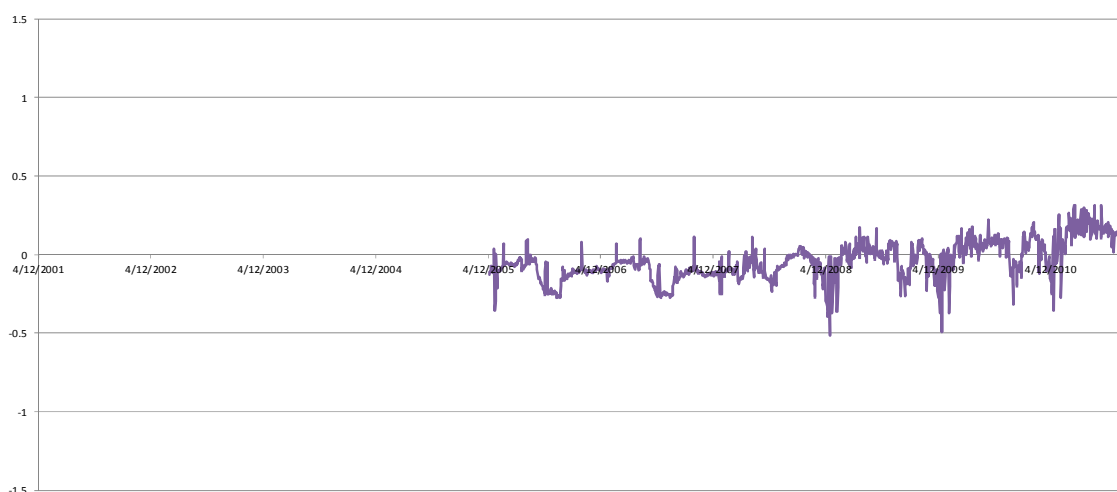


Source:    Smyczynski and Popovic, *Estimating the Cost of Debt: A Possible Way Forward*, Regulatory Development Branch, Australian Competition and Consumer Commission, April 2013, p. 44.

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[266]    QTC, *Submission to the Consultation Paper*, June 2013, pp. 12–13.

**Summary**

At this time we propose to use a third party data service provider as the source of an estimate of the benchmark return on debt. We have a preference for using an independent third party data service provider, where available and where the method for estimating the return on debt is transparent. At this stage, Bloomberg is the only independent third party data service provider that publishes a FVC. We propose to specify in a service provider's determination how an automatic update to the trailing average can be applied in circumstances where the method of calculating the allowed return on debt is no longer available or has been amended during a service providers regulatory control period.

## 7.3.2 Approach to calculate the averaging period to estimate the allowed return on debt

We propose to apply an averaging period to smooth out any short term volatility in the annually updated allowed return on debt. This smoothing can be achieved by averaging the daily yields published by a third party data service provider over a number of days. This is consistent with our current approach. Our current approach affords the service providers some discretion to choose an averaging period between 10 and 40 business days in length. This averaging is applied to the relevant Bloomberg FVC, where the averaging period is to commence as close as practically possible to the start of the regulatory control period. In addition, the averaging period chosen for the return on debt has been consistent with that of the risk free rate, which is also used to estimate the required return on equity.

The current rules require us to have regard to the desirability of using an approach that leads to the consistent application of any estimates of financial parameters.[267] However, the rules do not mandate a consistent (or, any) averaging period across the return on equity and return on debt. We are proposing to estimate the return on debt by directly referencing the published yields from an independent third party data service provider. The return on debt estimates sourced from an independent third party data provider does not require separate risk free rate estimation. The risk free rate used for return on equity estimation is only set once at the start of the regulatory control period, while we propose to update the return on debt annually. For these reasons, it is not necessary to apply a consistent averaging period for the risk free rate and return on debt.

In the consultation paper, we did not explicitly seek comment on the appropriate averaging methodology for the estimating the allowed return on debt. As a result, we note only the QTC made a suggestion in relation to this issue. In both QTC's submission to the issues paper and submission to the consultation paper, it suggested that the allowed return on debt could be estimated on a quarterly basis—where each estimate is equal to the average of the daily estimates during March, June, September and December.[268] However, the QTC provided no evidence to support the assumption that a quarterly debt profile would be an efficient financing practice.

We propose for each regulatory year in the regulatory control period to estimate the prevailing allowed rate of return on debt as a simple average of the prevailing rates observed over a period of 10 or more consecutive business days. Further, such an averaging period should satisfy the following conditions:

▪ the period must be specified prior to the commencement of the regulatory control period

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[267] NER, cl. 6.5.2 (e) (2); cl. 6A.6.2 (e) (2); NGR, r.87(5) (b).
[268] QTC, *Submission to the consultation paper*, June 2013, p. 14; QTC, *Submission to the issues paper*, February 2013, p. 29.

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

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

- the specified periods for different regulatory years are not required to be identical.

The allowed return on debt averaging periods can be either:

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

- determined by the AER, and notified to the service provider within a reasonable time prior to the commencement of the regulatory control period, if the periods proposed by the service provider are not agreed by the AER.

We consider that regulatory gaming is less likely when the averaging periods are agreed upon or specified in advance as the returns on debt are unknown for those future periods.

## Averaging periods for service providers with regulatory years ending 31 December and 30 June

Under the rules, the electricity distribution service providers are required to submit to the AER a pricing proposal for each regulatory year of the regulatory control period.[269] The gas distribution and transmission service providers are also required to submit to us an annual reference tariff variation proposal to meet the requirements of their specific access arrangements. As we are proposing to update a service providers' allowed return on debt estimates on an annual basis, the updated annual return on debt estimates should be submitted and approved by us in advance of a service providers' annual pricing/tariff proposals.

The length of the regulatory processes for different service providers vary under the transitional rules. To minimise the likelihood of regulatory gaming, a service provider must propose future averaging periods for each regulatory year of the regulatory control period in their initial regulatory proposal.

The starting date for the first agreed averaging period should be a period after the submission of a service provider's regulatory proposal. Some service providers are subject to a 'preliminary determination with a mandatory re-opener'. The transitional arrangements require us to use our draft decisions as a placeholder for those service providers' revenue requirements and prices until the final decision is made. This is because we are expected to release our final decisions after the commencement of their next regulatory control periods.[270] In these circumstances, the ending date for the first agreed averaging period for these service providers should be no later than a month before the release of our draft decision. For the other service providers the end date for the first agreed averaging period should be no later than a month before the release of our final decision for that service provider.

Some service providers' regulatory years are based on calendar years (1 January to 31 December). We propose that the subsequent averaging period these service providers can be any consecutive 10 or more business day period within a 12 month period from 1 July to 30 June which is prior to the forthcoming regulatory year. This is to provide service providers with sufficient time to calculate return on debt and be approved by us before they submit their annual pricing proposals for the upcoming regulatory year.

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[269]    NER, cl. 6.18.2(a).
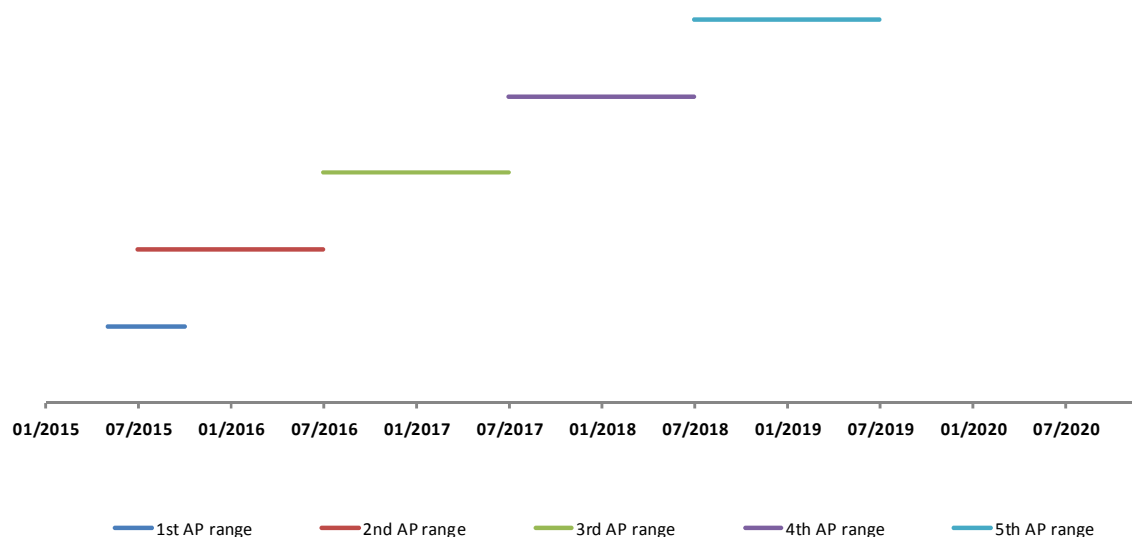[270]    AEMC, *Final rule change determination*, 29 November 2012, p. 214

Other service providers' regulatory years are based on financial years (1 July to 30 June). Therefore their averaging periods for the forthcoming regulatory years can be any consecutive 10 or more consecutive business day period within the latest calendar year before they submit their annual pricing proposals.

## An example of reasonable averaging periods for Victorian service providers

Figure 7.3 below illustrates the timing of each averaging period required to estimate annual return on debt for Victorian electricity distribution service providers. Victorian electricity distribution service providers have a five year regulatory period with their next regulatory control period starting on 1 January 2016. Under electricity transitional arrangements, they are required to submit regulatory proposals by 30 April 2015. The AER will publish its final decisions by 30 April 2016.[271] However, as they are subject to a 'preliminary determination with mandatory re-opener', we will use our draft decision as a placeholder. It is expected that we will publish our draft decisions by 31 October 2015.

When a Victorian electricity distribution network service provider submits its initial regulatory proposal by 30 April 2015, it will need to propose five future averaging periods for its annual return on debt calculation.[272] The first averaging period is to be 10 or more consecutive business day period from 1 May 2015 (after it submitted its regulatory proposal) to 31 March 2016 (a month before we publish our final decision). The next averaging period is to be any 10 or more consecutive business day period within the 12 month period starting on 1 July 2015 (6 months before the start of the regulatory control period) and ending on 30 June 2016 (6 months after the start of the regulatory control period). Similarly, the last averaging period that will be used to calculate return on debt for the fifth regulatory year is to be any 10 or more consecutive business day period within the 12 month period starting from 1 July 2018 and ending on 30 June 2019.

**Figure 7.3    Illustrative ranges for averaging periods for annual return on debt estimates**



Source:    AER analysis

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[271]    AEMC, *Final rule change determination*, 29 November 2012, p. 265
[272]    The number of averaging periods that will need to be proposed will depend on the number of years in the regulatory control period.

According to figure 7.3 above, a set of illustrative averaging periods for return on debt calculation for Victorian electricity distribution service providers could be:

- For the first regulatory year, the return on debt is based on 20 business day averages starting on the first business day of September 2015.

- For the second regulatory year, the return on debt is based on 20 business day averages starting on the first business day of September 2015.

- For the third regulatory year, the return on debt is based on 20 business day averages starting on the first business day of September 2016.

- For the fourth regulatory year, the return on debt is based on 20 business day averages starting on the first business day of September 2017.

- For the last regulatory year of the regulatory control period, the return on debt is based on 20 business day averages starting on the first business day of September 2018.

Note the averaging period for the first and second regulatory year in the new regulatory control period could be the same as the first two averaging period ranges overlap. Alternatively, the averaging periods do not need to be at the same time for each regulatory year in the regulatory control period.

### 7.3.3 Benchmark term of debt

We need to specify the benchmark debt term for a debt portfolio in order to estimate the allowed return on debt for a benchmark efficient entity. The benchmark debt term is relevant:

- to the period over which the trailing average is calculated; and

- as an input to obtaining yields to estimate the return on debt.

We are proposing an average term of debt for the benchmark debt portfolio of seven years. This conclusion is based on:

- the available evidence that suggests that the average term of debt is less than 10 years (that is, the average effective term of debt, which takes into account the 'swapping of the risk free rate', may be shorter than the average term at issuance)

- the requirement that automatic updating of the trailing average portfolio return on debt is mechanistic

- the difference in term premium between seven and 10 years is not material.

These issues are discussed below.

#### Evidence on weighted average term of debt

As noted in section 6.3.3 the assumed average term of debt will be informed by a consideration of efficient debt financing practices of the benchmark efficient entity. As discussed in section 6.3.3 a benchmark efficient entity will balance refinancing risk (or renegotiation risk) against the rate of return on a debt portfolio and interest rate risk. In particular, when a service provider seeks to refinance its debt, it faces the risk that the return on debt will be either higher or lower than that currently incurred or that it cannot obtain all of its debt requirements. This refinancing risk leads businesses to secure longer term debt and to diversify their debt portfolios by staggering the maturities on their debt. On the

other hand, assuming an upward sloping yield curve, longer term debt is more expensive. Accordingly, a benchmark efficient entity would choose its debt tenor to balance this trade-off. Lally supports the view that an efficient (unregulated firm) would optimally trade off the reduction in renegotiation risk from longer term debt and the increased interest rate risk arising from a shorter effective term of debt.[273]

In his report, Lally argues that in addition to financing its investment with long-term debt, the regulated businesses can make use of interest rate swaps to bring down the cost of debt without exposing themselves to refinancing risk. As noted above, Lally considers that this behaviour is efficient on the basis that as debt is progressively more expensive as its term increases an unregulated firm would optimally trade off the:

- reduction in renegotiation risk from longer term debt

- the increase in the risk free rate with the effective debt term

- the transaction costs of swap contracts

- the increased interest rate risk from a shorter debt term.[274]

For example, a business could issue 10-year debt and swap its risk free component into three year debt. The business would choose to do so only if this reduces the effective cost of debt. Thus, Lally argues that the regulator would need to observe not only the average term of debt, but the average reduction in the average term of debt resulting from swap contracts. Accordingly, any observations regarding the average term of debt from service providers may not be reliable. Further, as noted in section 6.3.3, while evidence from unregulated businesses could be considered to inform the weighted average term of debt at issuance, this may not be relevant given the regulatory regime may have a bearing on the efficient debt financing practices of service providers.

For the 2009 WACC Review, we requested data on the full debt portfolio from five of the regulated businesses. The estimated debt term at issuance, after accounting for floating rate notes and hedging, was estimated to be 7.37 years.[275]

Some businesses reported that their average debt term at issuance is around 10 years.[276] Others submitted that the average term should be around ten years because:

- this term is consistent with the long-lived nature of the assets

- this term is consistent our approach in the past

- an alternative choice of matching the debt term to the term of the regulatory period may introduce inefficient debt practices.[277]

PwC and CEG examined data for five energy businesses and also supported a 10 year term.[278] However, we do not consider that the results of PwC's and CEG's analysis may be relied upon due to issues with their methodology.

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[273]  M. Lally, *Estimating the cost of debt of the benchmark efficient regulated energy network business*, 26 June 2013, p. 11.

[274]  M. Lally, *Estimating the cost of debt of the benchmark efficient regulated energy network business*, 26 June 2013, pp. 11–12.

[275]  AER, *Final decision: Electricity transmission and distribution network service providers: Review of the weighted average cost of capital (WACC) parameters*, 1 May 2009, pp. 159–164.

[276]  Envestra, *Envestra Response to the AER Rate of Return Consultation Paper*, 28 June 2013, pp. 7–8.

[277]  ActewAGL, *Response to Rate of Return guidelines consultation paper*, 21 June 2013, pp. 1-2; APIA, *Submission to the Australian Energy Regulator's Rate of Return Guidelines May Consultation Paper*, June 2013, p. 27.

In particular, we found that there were significant differences between the data on debt collected by PwC from the Bloomberg and Loan Connector databases and the amounts in annual reports.[279] Further, PwC did not apply a consistent approach in reconciling the differences in data between the two databases and the annual reports. For example, where annual report amounts for bank debt were higher than the Bloomberg/Loan Connector data, it appears that PwC assumed a three year term for the bank debt differential.[280] In cases where the annual report amounts for debt were lower than the Bloomberg/Loan Connector amounts, each debt item was pro-rated by PwC so that amount equalled the annual report amounts for bank debt (and for bonds).[281] By pro-rating, PwC is making an assumption that the term for the differential between the annual report and database amounts is the same as that of the term for the debt in the databases. Importantly, PwC is assuming a term of debt, which is the issue that is being assessed.

In addition we note that PwC stated it was only for bank debt that the annual report amounts were higher than the Bloomberg/Loan Connector amounts. However, this does not appear to be the case from table A1 in the PwC report.[282] It is unclear how the reported differences for corporate bond amounts were treated by PwC. For example, the corporate bond amounts in the annual reports for the APA Group, Envestra and Spark Infrastructure were 17 per cent, 10 per cent and five per cent higher than the Bloomberg Loan Connector amounts, respectively.

The CEG analysis used Bloomberg data only for estimating the term at issuance which does not represent the full data on debt portfolios.[283] In particular, the Bloomberg dataset does not include comprehensive data on bank debt. We understand that bank debt accounts for around one third of the businesses portfolio. Given that bank debt tends to be a much shorter term at issuance, the lack of bank debt data in CEG's sample means that the term at issuance for the total debt portfolio is likely to be shorter than the estimates presented by CEG.

We also note that neither PWC or CEG make any adjustment for the likely swapping of the risk free rate as discussed above which may shorten the average term of debt.

As discussed, we consider that the average effective term of debt to be relevant in determining the average term of debt for a benchmark efficient entity. This is likely to be less than 10 years based on a consideration of the available evidence. Further, there is no evidence to suggest that service providers align the average term of debt with the asset life.

## Reliability regarding the automatic updating of the trailing average portfolio return on debt

We consider that it is preferable to use a third party data service provider for estimating the return on debt and to apply annual updating (see sections 7.3.1 and 6.3.5 respectively). Annual updating is required to be effected through the automatic application of a formula.[284]

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[278]   PwC, *Energy Networks Association: Benchmark term of debt assumption*, June 2013; CEG, *Debt strategies of utility businesses*, June 2013; The five companies were APA Group, DUET Group, SP AusNet, Envestra and Spark Infrastructure.

[279]   PwC, *Energy Networks Association: Benchmark term of debt assumption*, June 2013, Table A1, p. 14.

[280]   PwC, *Energy Networks Association: Benchmark term of debt assumption*, June 2013, Table 3.1 note a), p. 10.

[281]   PwC, *Energy Networks Association: Benchmark term of debt assumption*, June 2013, p. 9.

[282]   PwC, *Energy Networks Association: Benchmark term of debt assumption*, June 2013, Table A1, p. 14.

[283]   CEG, *Debt strategies of utility businesses*, June 2013, footnote 3, p. 8.

[284]   NER, cls. 6.5.2(l), 6A.6.2(l), NGR, r. 87(12).

Bloomberg ceased publishing a 10 year BBB FVC in October 2007 and a 10 year AAA FVC in June 2010. Due to the 'thinness' of the Australian bond market beyond five years, it is unlikely that a 10 year BBB FVC will be produced in the near future.

In order to estimate the yield on a 10 year debt term the AER currently adds the yield on the 10 year Commonwealth Government Security bond, which proxies for the risk free rate, to the yield for the 10 year debt risk premium (DRP). The 10 year DRP is calculated by adding to the Bloomberg seven year BBB FVC DRP, a term premium extrapolation of seven to 10 years. The paired bond extrapolation method is currently employed by us.

In attempting to automate the current paired bonds extrapolation method, we have found difficulties in specifying binary requirements which enable choosing two bonds for a company, with a term approximating seven years and another approximating 10 years. There is a trade-off between specifying the term requirements too tightly, such that a pair of bonds is not found, and specifying the term requirements too loosely, such that the yield curve differences for the two terms lead to unacceptable error in the DRP term differences. It is also difficult to specify factors which would lead to the exclusion of bonds on the basis of unusual trading activity. For example, if the company was subject to merger and acquisition activity.

The AER considered alternative extrapolation methods including:

- adding 1.5 times the difference between the five year and seven year yields from the Bloomberg BBB FVC to the seven year Bloomberg BBB FVC yield[285]

- adding the difference between the 10 year and seven year yields from the US Bloomberg BBB FVC (swapped backed into AUD) to the AUD seven year Bloomberg BBB FVC.

In relation to using the five year and seven year yields from the Bloomberg FVC, PwC reported that:[286]

> [w]e have also recognised that at times of increased uncertainty in debt markets, reliance on a straight line extrapolation may be inaccurate, which means that supplementary information about the likely rise in the longer section of the curve should be examined for confirmatory evidence. This is because straight line extrapolation based upon the Bloomberg yield estimates at 5 and 7 years is sensitive to the slope of the Bloomberg curve between those points, which can be erratic and sensitive to the composition of bonds around those particular maturities.

We have explored various extrapolation methods and found that over the period from 10 November 2005 to 9 October 2007 the linear extrapolation based on the five year and seven year yields from the Bloomberg BBB FVC resulted in a much larger error than other extrapolation methods.[287] We consider that a linear extrapolation based on the five year and seven year Bloomberg BBB FVC yield differential would require an overall constraint to be specified in the automation process to address the likelihood of unacceptable error. We also consider that it will be difficult to specify such a constraint. Furthermore, if this constraint is tightly specified, which would be desirable to avoid error, there is a likelihood that the extrapolation will be rejected, requiring a contingent position. This would

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[285]   We add 1.5 times the seven and five year difference as we wish to extrapolate from a 2 year difference to a 3 year difference of ten and seven years.

[286]   PwC, *Powerlink Methodology to estimate the debt risk premium: Report to Powerlink Queensland*, April 2011, p. 11.

[287]   The difference between the extrapolated curve and the actual Bloomberg BBB fair value curve on each day during the period is squared and then averaged. This   period is squared and then averaged. The resulting average squared error was 0.0122 for the 5 year / 7 year Bloomberg BBB FVC compared with 0.0025 for the 10 year/ 7 year Bloomberg AAA fair value curve. AER, *Final decision Jemena Gas Networks, Access arrangement proposal for the NSW gas networks*, June 2010, p. 188.

introduce uncertainty and continued debate over the extrapolation method which would be undesirable.

In relation to the use of the 10 year and seven year yields from the US Bloomberg FVCs, we consider that there are likely to be different risk exposures for a business operating in the US compared with one operating in Australia. As such, we consider that using the US Bloomberg curves to proxy for Australia is likely to result in unacceptable estimation error.

We also recognise that any extrapolation issue can be avoided if we use an in-house dataset. However, as discussed in section 7.3.1 an in-house dataset is not preferred by us.

**Materiality of the difference in term premium between seven and 10 years**

The AER has calculated the average difference in the yield between the 10 year and the seven year Bloomberg BBB fair value curve for all currently available data. From December 2001 to October 2007 the average difference in yield is 21 basis points.[288] PwC estimated a 7.6 basis points annual increment using the paired bond approach over the 20 day period ending on 16 December 2011.[289]

We consider that the debt term is likely to be less than 10 years, that there is a practical difficulty in automating annual updates and that the term premium difference is small. In light of these points, the AER considers that a debt term of seven years should be adopted.

**Different term between debt and equity**

We are proposing a debt term of seven years, which differs from the proposed equity term of 10 years. This is due to different considerations driving the choice of term for the return on debt and the return on equity (see appendix D for the discussion of the term for the return on equity).

We are proposing a 10 year equity term on the basis that regulated energy network service providers invest in long-lived assets which will generate regular cash flows over a similarly long term. Whereas, the proposed term of seven years for debt is based on considerations of regulated energy network service providers' debt portfolios, where these firms are likely to trade off a lower cost of debt associated with a shorter term against increased refinancing risk.

We consider that it is desirable to have a consistent term for estimating the MRP and risk free rate in equity.[290] However, given the different considerations for assessing the term of equity and debt we do not consider that consistency between the equity term and debt term is required.

## 7.3.4 Credit ratings

The credit rating is an input into deriving the benchmark return on debt. As with all other WACC parameters, the credit rating level of a benchmark efficient entity is not directly observable and must be estimated.

We consider that both the term structure of debt and the credit rating are important in determining the magnitude of the return on debt. As a general rule, the required return on debt is higher (lower) when

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[288] Bloomberg ceased publishing its 10 year BBB fair value curve in October 2007. Hence this is the most contemporaneous actual data available.
[289] PwC, *SP AusNet, Multinet Gas, Envestra, and APA Group: Estimating the benchmark debt risk premium*, March 2012, p. v.
[290] As per NER, cls. 6.5.2(e), 6A.6.2(e) and NGR, r.87(5)(b).

the credit rating is lower (higher), as investors require increased (decreased) compensation before committing funds due to the higher (lower) risk of default by the borrower.

We are proposing to adopt a credit rating of BBB+ as the benchmark for the return on debt. In reaching this view we consider that:

- a single credit rating of BBB+ is consistent with the definition of the benchmark efficient entity

- credit ratings are relatively steady over time for regulated energy companies

- empirical evidence supports a credit rating of BBB+

- a credit rating of BBB+ is consistent with previously adopted value.

Each of these issues is discussed in turn below.

## The definition of the benchmark efficient entity

For this guideline, we have adopted the definition of the benchmark efficient entity, which is a pure play, regulated energy network business operating within Australia (see chapter 3).

Implicit in the adoption of 'energy network business' in the proposed definition of the benchmark efficient entity is that there is a single benchmark for electricity and gas, and transmission and distribution networks. Adopting a single credit rating is consistent with a single benchmark.

In addition, the rate of return objective requires that the benchmark efficient entity must have a similar degree of risk. We consider that the risks between gas and electricity and transmission and distribution businesses are sufficiently similar, as discussed in chapter 3. As such we consider that there should be a single benchmark efficient entity. It follows that a single credit rating for electricity and gas networks is consistent with this view.

## Credit ratings are steady for regulated energy businesses

In advising us on issues related to different risks across asset pricing models and the WACC, Mckenzie and Partington found the credit rating has been steady for regulated utilities in Australia. They concluded that the credit risk for regulated utilities is likely to be relatively small under normal market conditions. This is because the default risk is small and the risk of credit migrations for utilities is low and stable.[291]

The rating agency Moody's also concurred with this view. In its recent industry outlook analysis, Moody's stated that the credit profile for Australia's regulated utilities sector continues to be underpinned by a regulatory framework that is mature and supportive in general, noting that:[292]

> We believe that the Australian regulatory regime remains fundamentally supportive under the new rules. This is partly because one of its long-standing objectives - that is, to incentivize investments in the network assets - remains in place.
>
> In spite of changes made to the WACC setting process, other credit supportive features of the Australian regulatory regime are still in place. These include the regulator's independence, timely recognition of capital investments through the 'building block' and the Regulated Asset Base (RAB) approach, as well as the fixed tariff path for the five-year regulatory period. These features continue to underpin a generally

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[291] M. McKenzie, and G. Partington, *Report to the AER on risk, asset pricing models and WACC*, 27 June 2013, p. 15.
[292] Moody's, *Industry outlook: Australian Regulated Utility Networks*, 21 February 2013, p. 8.

supportive - albeit weakened - regulatory environment in Australia. Background information on the building block approach is provided in Appendix 1.

Furthermore, the regulators' track record and the institutional strength of the Australian regulatory environment - developed over the past 10 years - provides some reassurance that the likelihood of an abrupt change owing to the increased regulatory discretion is not high.

Finally, the sector's monopoly position insulates it from the direct impact of competition. The essential nature of its energy transportation business supports the long-term demand for its services. These characteristics further enhance the sector's strong business risk profile and provide a backstop against detrimental changes in regulation, which could stifle the required investment in these networks.

## Empirical evidence

To inform our view on the benchmark credit rating we have had regard to recent empirical evidence. We consider that the recent empirical evidence supports a BBB+ credit rating.

In order to calculate median credit ratings we have assigned values to the different credit ratings, consistent with the method adopted in our 2009 WACC review. These values are as follows:

**Table 7.1        Values assigned to credit ratings**

| Credit Rating | Value | Credit Rating | Value | Credit Rating | Value |
|---|---|---|---|---|---|
| BBB- | 1 | A | 5 | AA+ | 9 |
| BBB | 2 | A+ | 6 | AAA- | 10 |
| BBB+ | 3 | AA- | 7 | AAA | 11 |
| A- | 4 | AA | 8 | AAA+ | 12 |

Source:      AER, *Explanatory statement: Electricity transmission and distribution network service providers: Review of the weighted average cost of capital (WACC) parameters, table 9.6*, December 2008, p. 278.

We observe that no firm is a pure play regulated energy network business. Therefore in choosing comparators to inform the value, this requirement must be relaxed. On this basis, the appropriate full sample comparators are listed below:[293]

- APT Pipelines Ltd

- ATCO Gas Australian LP

- DBNGP Trust

- DUET Group

- ElectraNet Pty Ltd

- Energy Partnership (Gas) Pty Ltd

- Envestra Ltd

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[293]   This set of firms was drawn from Standard and Poor's industry report cards (November 2012, table 2), with the exclusion of a firm that is government owned (Ergon Energy Corp Ltd).

- ETSA Utilities

- Powercor Australia LLC

- SP AusNet Group

- SPI (Australia) Assets Pty Ltd

- The CitiPower Trust

- United Energy Distribution Pty Ltd.

This analysis covers both electricity and gas networks, which is consistent with our position to have a single benchmark, given that the regulated energy networks are considered to have a similar degree of risk. This also supports a point estimate of a credit rating, rather than a range.

From the listed firms above it is also evident that there are relatively few samples of pure play gas or electricity networks. Assigning values from Table 7.1 to the different credit ratings for each business, we have derived a median credit rating from the full sample of regulated energy networks over the period of 2002–2013, as detailed in Table 7.2 below.

**Table 7.2    Median credit rating of Australian regulated energy networks (2002–2013)**

| Measure | Energy Networks |
| --- | --- |
| Median Credit Rating (2002–2012) | BBB+ |
| Median Credit Rating (2002–2013) | BBB+, Negative Watch |
| Median Credit Rating (June 2013)[a] | BBB |

Source:    AER analysis.
Note:    (a): The 2013 crediting ratings for businesses were obtained from Bloomberg on 25 June 2013.

For the 2002–2012 period, our analysis indicates a median rating of BBB+. However, we observe that the credit rating outcomes can be sensitive to the time period used for estimation purposes (for example, inclusion of 2013 data changes the median credit rating to BBB+ with a negative watch, while the median credit rating for 2013 only is BBB).

Adopting BBB+ as benchmark credit rating is consistent with recent determinations and the 2009 WACC review. Our assumption in determinations has been a credit rating of BBB+ for electricity and gas networks. We note that a credit rating of BBB+ has been within a range of previously observable credit ratings for private energy businesses (excluding government owned businesses).

The ENA and its consultant Kanangra in response to the consultation paper submitted that:[294]

- the AER's approach to estimating the cost of equity has, in the context of current low CGS yields, resulted in insufficient cash-flows for a benchmark 60 per cent geared entity to retain a BBB+ credit rating

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[294]    ENA, *Submission to the consultation paper*, 28 June 2013, pp. 93–94.

- cash-flows analyses are consistent with a marginal Standard and Poor's rating of between BBB- to BBB and Moody's credit rating of Baa2

- an average credit rating of less than BBB+ for the actually observed credit ratings for regulated businesses

- since the benchmark credit rating was last assessed in 2008 the credit rating of NSPs have been stable.

In response, we consider the following issues regarding ENA's submission:

- We note that, with particular application to Standard and Poor's credit rating, Kanangra assumed that the business risk profile for the notional service provider is excellent.[295] Based on this assumption and its credit matrix of Funds from Operations (FFO) Interest Cover and FFO/Debt, Kanangra derived in some instances a credit rating BBB- for a small sample of the regulated energy networks.[296] However, we do not consider a BBB- credit rating will be derived, based on this method and Standard and Poor's matrix of business risk profile and financial risk profile in Table 7.3 below, as we note there is no BBB- corresponding to an 'excellent' business risk profile in that matrix.

**Table 7.3    Standard and Poor's matrix of Business Risk Profile and Financial Risk Profile**

| Financial risk > Business risk V | Minimal | Modest | Intermediate | Significant | Aggressive | Highly Leveraged |
|---|---|---|---|---|---|---|
| Excellent | AAA | AA | A | A- | BBB | - |
| Strong | AA | A | A- | BBB | BB | BB- |
| Satisfactory | A- | BBB+ | BBB | BB+ | BB- | B+ |
| Fair | - | BBB- | BB+ | BB | BB- | B |
| Weak | - | - | BB | BB- | B+ | B- |
| Vulnerable | - | - | - | B+ | B | B- or below |

Source:    Reproduced from table 4 of Kanangra report, p. 15.

- Notably, Standard and Poor's consider that the regulatory framework itself is the most critical aspect that underlies regulated utilities' creditworthiness.[297] Standard and Poor's also acknowledge that the stable cash flows of regulated network utilities mean that less weight is given to their more aggressive metrics.[298]

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[295]    ENA, *Response to the AER's rate of return guidelines consultation paper, Attachment 16: Credit Ratings for Regulated Energy Network Services, Appendix 1: Supporting tables, KANANGRA,* June 2013, p. 30.

[296]    ENA, *Response to the AER's rate of return guidelines consultation paper, Attachment 16: Credit Ratings for Regulated Energy Network Services, Table 14, KANANGRA,* June 2013, p. 24.

[297]    Standard and Poor's, *Key credit factors: Business and financial risks in the investor–owned utilities industry*, November 2008, p. 8.

[298]    Standard and Poor's, *Key credit factors: Business and financial risks in the investor–owned utilities industry*, November 2008, p. 17.

- While a rating agency's exact method is proprietary, it is reasonable to assume that a holistic assessment is undertaken when determining credit ratings. We also consider that the assessment of credit ratings is inherently subjective, and the outcomes highly sensitive to various assumptions. As a result, a financeability assessment—whether by rating agencies or by a regulator—necessarily involves judgement.

- Also table 7.4 shows that the regulatory framework and the low business risk associated with a natural monopoly business are the key credit-supportive factors for regulated energy networks, given that regulatory environment and asset ownership model accounts for 40 per cent of the broad rating factor weighting. It is important, therefore, to recognise that any financeability considerations by a regulator should amount to more than just the assessment of credit metrics against their target levels.

**Table 7.4    Moody's rating methodology for regulated energy networks**

| Broad rating factors | Broad rating factor weighting | Rating sub-factor | Sub-factor weighting |
|---|---|---|---|
| Regulatory environment and asset ownership model | 40% | Stability and predictability of regulatory regime | 15% |
| | | Asset ownership model | 10% |
| | | Cost and investment recovery | 10% |
| | | Revenue risk | 5% |
| Efficiency and execution risk | 10% | Cost efficiency | 6% |
| | | Scale and complexity of capital programme | 4% |
| Stability of business model and financial structure | 10% | Ability and willingness to pursue opportunistic corporate activity | 3.33% |
| | | Ability and willingness to increase leverage | 3.33% |
| | | Targeted proportion of operating profit outside core regulated activities | 3.33% |
| Key credit metrics | 40% | Adjusted Interest Cover Ratio or Funds From Operations / Interest | 15% |
| | | Net Debt / RAB | 15% |
| | | Funds From Operations / Net Debt | 5% |
| | | Retained Cash Flow / Capex | 5% |

Source:    Moody's

We consider that Kanangra's estimate of implied ratings derived from cash flow analysis is based on an approach called 'benchmark notional NSP'. This is similar to the 'shadow credit rating analysis'

approach undertaken by Australia Ratings on behalf of APA GasNet during the Victorian gas access arrangement review process, with which we disagreed.[299]

In our APA GasNet decision which assessed the Australia Ratings' approach, we concluded that:[300]

▪ Australian Ratings' methodology was very sensitive to assumptions adopted. Using the Standard and Poor's business and financial risk matrix, it appeared that a minor change in the analysis of financial risk could have resulted in APA GasNet achieving an A– rating. An A– rating is two levels higher than the BBB credit rating determined by Australia Ratings for APA GasNet, and one level higher than the benchmark BBB+ credit rating used to determine then allowed return on debt for APA GasNet.

▪ Australian Ratings' analysis did not clearly test or explain how its overall shadow credit rating would change if aspects of its analysis employed different assumptions.

Further, we have replicated Kanangra's full sample analysis using a median credit rating approach rather than using its average approach (during last WACC review, we considered that examining median credit ratings of sample businesses is the most appropriate approach to determine a benchmark efficient credit rating).[301]

As indicated in table 7.5, our analysis using Kanangra's sample of businesses and credit ratings, gives a median Standard and Poor's credit rating of BBB+ with a positive outlook when 2013 data is included. Further, exclusion of 2013 data changes the median credit rating to A-.

**Table 7.5      Median credit rating of Australian regulated energy networks (2008–2013)**

| Measure | Energy Networks |
|---|---|
| Median Credit Rating (2008–2013) | BBB+, Pos |
| Median Credit Rating (2002–2012) | A- |

Source:     This set of firms and ratings was drawn from Kanangra's report, table 15, p. 25.
Note:       NB: "Pos" = positive outlook.

Overall, as indicated in table 7.2, we have undertaken analysis based on expanded samples which include the full sample of regulated networks and historical rating data series. This analysis does not support a departure from BBB+ as the benchmark credit rating. Further, given the issues previously identified with Australia Ratings' analysis, caution should be exercised on the weight we should put on credit matrix analysis in determining the credit rating for a benchmark efficient entity. Accordingly, we consider that the current assumption of a BBB+ rating should be maintained.

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[299]   AER, *Final decision, APA GasNet Australia (Operations) Pty Ltd 2013-17 part 3*, March 2013, pp. 112–113.
[300]   AER, *Final decision, APA GasNet Australia (Operations) Pty Ltd 2013-17 part 3, March 2013*, pp. 112–113.
[301]   AER, *Final decision: Electricity transmission and distribution network service providers: Review of the weighted average cost of capital (WACC) parameters*, 1 May 2009, p. 267.

# 8 Imputation credits

This chapter outlines our proposed position on the value of imputation credits in building block revenue determinations, and their relationship to the rate of return. It puts forward a conceptual framework for estimating the value of imputation credits (gamma), as well as an estimate—determined as the imputation credit payout ratio multiplied by the utilisation rate.

## 8.1 Issue

Under the Australian imputation tax system, investors receive an imputation credit for tax paid at the company level. For eligible shareholders, this credit offsets their Australian income tax liabilities. If the value of imputation credits exceeds an investor's tax liability, that investor can receive a cash refund for the balance. The credits are therefore a benefit to investors in addition to any cash dividend or capital gains from owning shares. The value of imputation credits has a range of possible values between zero and one.

The value of imputation credits is important in regulation because it affects the estimation of building block revenue allowances. The measurement and estimation of the building block revenue allowances, including the rate of return, depends on whether cash flows are pre-tax or post-tax. We use a post-tax framework with a rate of return that is after company tax but before personal tax. Under a pre-tax WACC framework gamma is a WACC parameter. Tax credits provide value to investors by offsetting income tax liabilities. Considering this value, eligible investors would accept an investment with a lower rate of return than if there were no imputation tax credits. In contrast, under a post-tax WACC framework, gamma is not a WACC parameter.[302] Instead, it is a direct input into the calculation of tax liability for the company, via the corporate tax component of the building block model. This approach is consistent with standard Australian regulatory practice and is the approach prescribed in the rules.[303]

The Monkhouse framework defines the value of imputation credits as the product of a payout ratio and a utilisation rate.[304] In the consultation paper, we proposed to continue to model the value of imputation credits in this way.[305] Stakeholders supported this proposal.[306] However, both of these parameters are conceptually complex and difficult to estimate. As a result, gamma has always been controversial in regulatory decisions. Experts on imputation credits have advocated a wide range of values that investors place on imputation tax credits. These span from zero, meaning no value, to one, meaning full value, and different points within this range. Australian regulators historically adopted the midpoint of this range (i.e. 0.5).[307]

In 2009, the AER conducted a review of the value of imputation credits as part of its own 2009 WACC review. In that review, we adopted 0.65 as the value for imputation credits, based on:

- a payout ratio of 1

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- a utilisation rate of 0.65—calculated as an average of the Beggs and Skeels dividend drop off study (0.57)[308] and the Handley and Maheswaran tax statistic study (0.74).[309]

We then applied a gamma of 0.65 in the Queensland and South Australian electricity distribution determinations. Energex and Ergon successfully sought tribunal review of this decision. The Tribunal set the payout ratio to 0.7 and commissioned a dividend drop off study from SFG.[310] The Tribunal adopted SFG's recommendation that the utilisation rate be set at 0.35. This resulted in a gamma of 0.25.

Since 2011, we have used 0.25 as the value of imputation credits on the basis of the Tribunal adopting these values.[311] Prior to now, we have not sought to substantively revisit or review gamma during individual regulatory determinations. This is primarily because the tribunal process highlighted the need for a complete re-evaluation of gamma. This was not practicable given the time constraints and more limited scope for consultation during individual regulatory determinations. The development of the rate of return guideline is an ideal opportunity to undertake a further review of the issue.

Specifically, in making its decision the tribunal recognised that:[312]

> The Tribunal has found some deficiencies in its understanding of the foundations of the task facing it, and the AER, in determining the appropriate value of gamma. These issues have not been explored so far because they have not arisen between the parties, who appear to be in agreement about how the Rules should be interpreted regarding the treatment of corporate income tax. They may be matters that the Tribunal will take up in its further final decision in these matters; or they may best be left until the next WACC review.

And that:[313]

> Further, the Tribunal notes that estimation of a parameter such as gamma is necessarily, and desirably, an ongoing intellectual and empirical endeavour.

We note the appropriate value for gamma is not settled amongst Australian regulators. Some regulators have also adopted the tribunal's value of 0.25, while other regulators have continued to adopt higher gamma values.[314]

## Process of re-evaluating the value of imputation credits

The development of the rate of return guideline is an opportunity to re-evaluate the conceptual framework and estimates underpinning the regulatory value of the value of imputation credits. To do so, we have undertaken the following steps:

- Re-evaluated the role of imputation credits within the building block revenue framework. Specifically, we:

  - re-evaluated the framework papers on imputation credits, such as Officer and Monkhouse[315]

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[308] D. Beggs and C.L. Skeels, 'Market arbitrage of cash dividends and franking credits', *The economic record*, Vol. 82, No. 258, September 2006, p. 247.

[309] J.C. Handley and K. Maheswaran, 'A measure of the efficacy of the Australian imputation tax system', *The economic record*, Vol. 84, No. 264, March 2008, p. 90.

[310] Australian Competition Tribunal, *Application by Energex Limited (No 2) [2010] AComptT 7*, October 2010, para. 147.

[311] Australian Competition Tribunal, *Application by Energex Limited (Gamma)(No 5) [2011] AComptT 9*, May 2011, para. 42.

[312] Australian Competition Tribunal, *Application by Energex Limited (No 2) [2010] AComptT 7*, October 2010, para. 149.

[313] Australian Competition Tribunal, *Application by Energex Limited (Gamma)(No 5) [2011] AComptT 9*, May 2011, para. 45.

[314] This is summarised in the consultation paper (in appendix H). See: AER, *Rate of return consultation paper, May 2013*, p. 126.

- re-evaluated papers that extend these foundational models and consider their implications in a regulatory context[316]

- reviewed the material from the 2009 WACC review.

- Engaged with the Australian Tax Office (ATO) to discuss the life-cycle of franking credits, and to clarify aspects of their operation.

- Considered new empirical evidence, including:

    - new estimates—ERA, NERA, SFG[317]

    - new related studies—Abraham, Rantapuska.[318]

- Considered other evidence—such as:

    - The KPMG 2013 valuation practices survey.[319]

    - The ongoing presence of equity imputation funds, whose stated purpose is to invest in shares with high franking proportions.

    - Recent government moves to 'close the loophole' that currently promotes a practice called 'dividend washing'. In simple terms, this is a complex trading process firms can pursue to access double portions of imputation credits.

- Considered the Tribunal's 2011 decision and its more recent decision on DBP.[320]

Between the draft guideline and final decision, we intend to continue liaising with experts, the ATO and stakeholders to continually refine our analysis and data sources. In particular, we expect to commission an expert review of our reasoning in this explanatory statement which supports our proposed value in the draft guideline.

## 8.2 Proposed approach

We propose that the value of imputation credits within the building block revenue framework is an estimate of the expected proportion of company tax which is returned to the representative investor through utilisation of imputation credits.

Applying this conceptual framework, we propose to adopt 0.5 as the value of imputation credits. This is a product of a:

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[315] R.R. Officer, 'The cost of capital of a company under an imputation tax system', *Accounting and finance*, Vol. 34, Iss. 1, May 1994, pp. 1–17; P.H.L. Monkhouse, 'The cost of equity under the Australian dividend imputation system', *Accounting and finance*, Vol. 33, Iss. 2, November 1993, pp. 1–18.

[316] For example: M. Lally and T. van Zijl, 'Capital gains tax and the capital asset pricing model', *Accounting and finance*, Vol. 43, May 2003, p. 187–210.; M. Lally, 'The CAPM under dividend imputation', *Pacific accounting review*, Vol. 4, No. 1, December 1992, pp. 31–44.

[317] Economic Regulation Authority, *Explanatory statement for the draft rate of return guidelines: Meeting the requirements of the National Gas Rules*, August 2013, pp. 201–205; ENA, *Response to the AER's rate of return guidelines consultation paper, Attachment 12: The Payout Ratio, NERA*, 28 June 2013; ENA, Response to the AER's rate of return guidelines consultation paper, Attachment 13: Updated dividend drop-off estimate of theta, SFG, 28 June 2013.

[318] These studies are related to the estimation of gamma and provide relevant and useful information, but they don't directly estimate either the payout ratio or the utilisation rate; M. Abraham, 'Tax refund for unused franking credits and shareholder pattern change: Australian evidence', *International journal of social and behavioural sciences*, Vol. 1, Iss. 1, January 2013, pp. 1–15; E. Rantapuska, 'Ex-dividend day trading: who, how and why? Evidence from the Finnish market', *Journal of financial economics,* Vol. 88, Iss. 2, May 2008, pp. 355–374.

[319] KPMG, *Corporate finance: Valuation practices survey*, April 2013, pp. 26–28

[320] Australian Competition Tribunal, *Application by DBNGP (WA) Transmission Pty Ltd (No 3) [2012] ACompT 14*, July 2012.

- 0.7 payout ratio— based mainly on tax statistic data.[321]

- 0.7 utilisation rate— based on:[322]

  - 70 per cent domestic ownership of Australian equity

  - tax value redemption studies pointing to a utilisation rate of 0.45–0.8

  - implied market value studies, suggesting a value from 0 to 1.

## 8.3 Reasoning

In coming to our draft decision on the value of imputation credits, we have considered:

- the conceptual framework for the value of imputation credits

- the role of imputation credits in the regulatory framework

- the benchmark sample

- the payout ratio

- the utilisation rate.

### 8.3.1 The conceptual framework for the value of imputation credits

We have re-evaluated the conceptual task of estimating the value of imputation credits. Having done so, we consider the conceptual task is as follows.

Imputation credits are an additional return to investors, beyond the capital gains and dividends they receive from owning shares. Under the rules,[323] the value of imputation credits is therefore applied as a reduction to the estimated cost of corporate income tax. This is because some the tax that the company pays generates imputation credits. Where investors receive and redeem these imputation credits, the government reduces their tax liability or pays them a cash refund to the face value of the credit.[324] Further, to operate consistently with the rate of return, the value of imputation credits should fit within the Officer / Monkhouse framework in the presence of imputation credits.

This framework requires that:

- The value of imputation credits is the representative investor's expected reduction through imputation credits of effective company tax paid. Specifically, this is the reduction of company tax measured before personal tax.

- The representative investor is a weighted average of investors in the defined market.[325] Specifically, investors are weighted by their value weight (equity ownership) and their risk

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[321] See section 8.3.4.
[322] See section 8.3.5.
[323] NGR, r. 87A; NER, cl. 6.5.3 and NER, cl. 6A.6.4.
[324] This is correct under the AER's consistent position of estimating parameters after company tax but before personal tax. If we considered parameters after personal tax, we would have to use a different CAPM, and the value of an imputation credit would depend on an investor's marginal tax rate.
[325] See, for example: P.H.L. Monkhouse, 'The cost of equity under the Australian dividend imputation system', *Accounting and finance*, Vol. 33, Iss. 2, November 1993, pp. 1–18. ; M. Lally and T. van Zijl, 'Capital gains tax and the capital asset pricing model', *Accounting and finance*, Vol. 43, May 2003, pp. 187–210.

aversion.[326] This means that the commonly referred to concept of the market price being set by the 'marginal investor' is not particularly meaningful or helpful in this context. Rather, the market price is set collectively by all investors, to the extent they participate in the defined market:

- Consistent with the 2009 WACC review, we propose to define the market as an Australian domestic market that recognises the presence of foreign investors to the extent they invest in the Australian market.[327] This definition reflects the realities of capital markets, and sits in between the purely theoretical definitions of a 'full segregated' market and a 'fully integrated' market. This definition has critical implications for the value of imputation credits.

- The CAPM assumes that the representative investor values the equity returns over the full CAPM period, with no trading during that period.[328] In reality, regular, ongoing trading obviously does take place. However, where model inputs draw on trading data, it is important that this data has arisen throughout the trading year so it is not especially sensitive to any specific trading circumstances at particular times. That is, the model should produce an estimate for an investor valuing an investment at any point during a year.

These framework requirements relating to the conceptual task have, to varying extents, been discussed in past regulatory analysis.[329] However, we consider the implications of these requirements have not been fully considered and used in previous analysis to inform the selection of estimation methods.

From this re-evaluation, we have determined that the regulatory debate on the value of imputation credits did not fully address this conceptual task. Instead, the previous regulatory debate has included an economic and econometric debate over certain arcane details, and sole reliance on a particular class of evidence that has a number of significant limitations. We consider this outcome is not in the long term interests of energy consumers. We consider a wider appraisal of the available evidence is better regulatory practice.

Much of the regulatory debate from the 2009 WACC review and the Tribunal review was focused on evaluating detailed technical issues around specific studies or pieces of evidence. We, and consequently the tribunal, would have been assisted by taking a step back from the detail and starting from a better conceptual understanding of imputation credits within the building block revenue model. The Tribunal acknowledged these shortcomings in its decisions.[330]

In responding to the Tribunal's comments, we have now considered the questions raised in McKenzie and Partington's March 2011 report,[331] and extended them by revisiting the foundational theory of the value of imputation credits. Having done so, we have reached views on these issues that were not before the Tribunal at the time of its review.

Further, we consider that in the 2009 WACC review and subsequent decisions, we adopted too narrow a scope of evidence to estimate the utilisation rate. Specifically, our analysis was limited only to tax statistic estimates and dividend drop off studies. Accordingly, in this guideline we have

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[326] See M. Lally and T. van Zijl, 'Capital gains tax and the capital asset pricing model', *Accounting and finance*, Vol. 43, May 2003, p. 192.
[327] AER, *Final decision: WACC review, May 2009,* pp. 97–101.
[328] See for example: J Lintner, 'The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets', *The review of economics and statistics*, Vol. 47, No. 1, February 1965, p. 15.
[329] For example: Handley, *Further comments on imputation credits: A report prepared for the AER*, April 2009, p. 12.
[330] Australian Competition Tribunal, Application by Energex Limited (No 2) [2010] ACompT 7 (13 October 2010), paras 149 and 150.
[331] McKenzie and Partington on behalf of the security industry research centre of Asia-Pacific (SIRCA) limited, *Report to the AER: Response to questions related to the estimation and theory of theta*, March 2011.

endeavoured to draw on a broader range of evidence with regard to its strengths and weaknesses. Much of this evidence was also not before the Tribunal at the time of its review.

## 8.3.2 The role of imputation credits in the regulatory framework

Under the rules, the AER is required to use a building block framework to estimate revenue for service providers. The building block framework sets out how to estimate the various revenue streams that make up a total revenue allowance.[332] The function of this building block revenue estimate is to determine the allowed revenue that a service provider requires to:

- Fund its operating expenses

- Achieve adequate returns to raise debt and equity in order to finance its capital investments. This is made up of a rate of return on capital, to compensate investors for the risks of investment, and a return of capital (depreciation), which gradually returns the initial principal of the investment (and subsequent investments) back to investors

- Pay its tax liability

- Reflect any incentive increments or decrements in the design of the regulatory regime.

It is important that under the building block framework, investors that own the service provider benefit from its operating profits, and/or capital gains. As an example, holding all else constant, if a service provider was not compensated for its taxation expense but did have to pay tax, this shortfall would reduce the pool of funds available to either reinvest into the company (potentially producing capital gains) or to distribute to investors. Therefore, all building block revenue allowances ultimately impact the total return to investors. In this way, increasing or decreasing a building block revenue component will increase or decrease the return to investors.

One important expense that a company faces is taxation. An allowance for taxation can be estimated as a separate revenue item, or through the return on capital. Either way, the service provider and ultimately investors are compensated for the tax liability that the company faces. The difference is only how this return is presented. The rules now specify that the AER must estimate a nominal, post-tax, rate of return.[333] Amongst other things, this means that the return on capital does not include an allowance for the cost of taxation.[334] As a result, the building block framework includes an estimate of the cost of corporate income tax as a separate revenue item. The construction of the rule governing the cost of corporate income tax is consistent with the treatment of imputation credits in the Officer framework.[335]

### Consistency between the building block framework and the Officer framework

The Officer framework and the tax provisions in the rules include the value of imputation credits as an adjustment to the estimated cost of company income tax. Specifically, the framework implies that company tax is reduced for the value of the cash flows from the service provider to the government

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[332] NER, cl. 6.4.3; NER, cl. 6A.5.4; NGR, r. 76.
[333] NGR, r. 87; NER, cl. 6.5.2 and NER, cl. 6A.6.2.
[334] However, the calculation of historical excess returns on stocks (used in estimation of the MRP) requires that returns be 'grossed up' for the assumed value of imputation credits. This is because share prices used to estimate these returns are post-personal tax. That is, investors trading in these shares have already incorporated their personal tax circumstances into bid prices. This is to be consistent with a framework that is after company tax but before personal tax.
[335] See appendix K.

which are then distributed back to investors through imputation credits (see figure 8.1). As stated by Officer:[336]
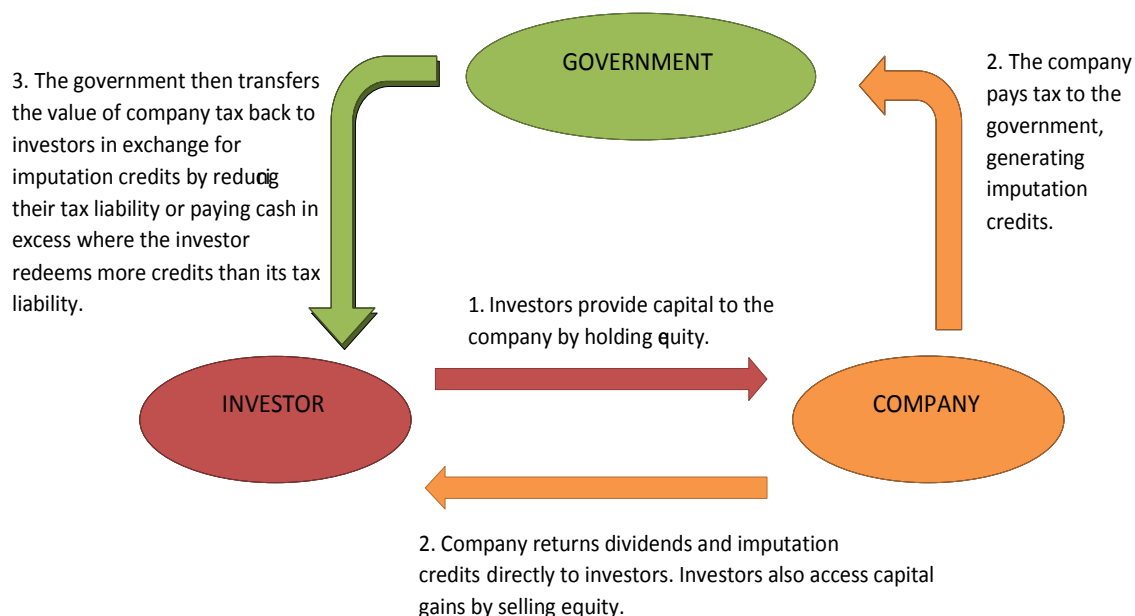
> The proportion of company tax that can be fully rebated against tax liabilities is best viewed as income tax collected at the company level. In effect, the tax collected at the company level is a mixture of company tax and personal tax, the company tax being that proportion of the tax collected which is not credited (rebated) against personal tax. If all the collection of tax from a company is rebateable (in the Australian context if all the franking credits can be used against personal tax liabilities), then for the company's shareholders, company tax is effectively eliminated. The tax the company pays is simply the shareholders' personal income tax being collected at the company level.

The value of this imputation credit offset is included in the estimated cost of company tax building block. Specifically, it is the representative investor's expected utilisation of franking credits as a proportion of the total company tax paid. Under the Officer and Monkhouse constructions[337], the value of imputation credits to investors can be broken down into:

- A payout ratio—every \$1 of tax that a company pays generates \$1 of imputation credits. However, companies do not have to distribute any or all of these credits. The payout ratio is the proportion of generated credits that the benchmark company distributes. This addresses the role of the company in the imputation tax system.

- A utilisation rate (theta)—which is the value investors receive through imputation credits as a proportion of the credits that the benchmark company distributes. This addresses the interaction of the government and the investor in the imputation tax system.

These interactions are illustrated in figure 8.1 below.

**Figure 8.1        How imputation credits become a return to investors**



3. The government then transfers the value of company tax back to investors in exchange for imputation credits by reducing their tax liability or paying cash in excess where the investor redeems more credits than its tax liability.

2. The company pays tax to the government, generating imputation credits.

GOVERNMENT

1. Investors provide capital to the company by holding equity.

INVESTOR

COMPANY

2. Company returns dividends and imputation credits directly to investors. Investors also access capital gains by selling equity.

Source:    AER analysis

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[336]    R. R. Officer, 'The cost of capital of a company under an imputation tax system', *Accounting and finance*, Vol. 34, Iss. 1, May 1994, p. 2.
[337]    Both of these constructions are discussed in greater detail in appendix K.

So, ultimately the value of imputation credits to investors can be mapped through the life cycle of the imputation system:

▪ To calculate the payout ratio, we look at the (face) dollar value of the representative company's distribution of imputation credits as a proportion of the (face) dollar value of tax that they pay.

▪ Then, to calculate the utilisation rate, we look at the before personal tax (face value) reductions of company tax (utilisation of credits) as a proportion of the (face) dollar value of imputation credits that are distributed from companies.

The after-personal-tax value to an investor of $1 of franking credits—or dividends, or capital gains—depends on the representative investor's marginal tax rate. However, we estimate all rate of return parameters after company tax but before personal tax. Before personal tax, every $1 of franking credits redeemed is equivalent to $1 of additional return. So, the relevant value in the value of imputation credits depends on the extent to which the representative investor receives credits from companies, and then the extent to which they utilise credits for their full face value. This is also consistent with the common assumption that for simplicity, dividends should be assumed to be worth their face value in the Officer framework.[338] Supporting the cash flow interpretation of the value of imputation credits, Officer and Hathaway state that:[339]

> …it is quite important to recognise that the value factor of credits (the value of distributed credits) is not in itself the "gamma" factor used within the Officer WACC formulae, a point which is often confused or mis-represented. The gamma factor in the various Officer WACC formulae represents that part of the tax paid by companies as company tax but is in reality a pre-payment of personal tax. Because we typically estimate costs of capital after company tax but before personal tax, the portion of company tax prepayments captured as pre-payment of personal tax (ie gamma) is a cash flow that has to be added to shareholders' pre-personal tax cash flow.

## The cost of company tax rule

The electricity distribution rule governing the cost of company tax includes this adjustment which is set out below.[340]

The estimated cost of corporate income tax of a Distribution Network Service Provider for each regulatory year (ETCt) 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

$\gamma$ is the value of imputation credits

The electricity transmission rules and gas rules contain equivalent provisions.[341]

This formula can be broken down into two components which explain the intuition of the rule:

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[338] Specifically, All Australian regulators assume dividends are at face value within calculation of the cost of equity.
[339] N. Hathaway and B. Officer, *The value of imputation tax credits: Update 2004*, November 2004, p. 7.
[340] NER, cl. 6.5.3
[341] NGR, r. 87A and NER, cl. 6A.6.4.

- (ETIt x rt) is an estimate of the benchmark efficient entity's tax payments to the government

- (1 – γ) is an adjustment to reduce the tax allowance for the value (γ) of tax payments which are then transferred from the government to investors via imputation credits.

This rule, and the Officer framework, suggests that the value of imputation credits is an estimate of the expected proportion of company tax which is returned to the representative investor through utilisation of imputation credits.

### 8.3.3 The benchmark company

In practice, gamma can be estimated either as a market-wide parameter, industry-wide parameter, or firm-specific parameter. In the 2009 WACC review, we estimated gamma as a market-wide parameter.[342]

In the consultation paper, we sought submissions on whether we should continue to estimate gamma as a market wide parameter. The ENA supported this position.[343]

We propose to maintain estimating gamma as a market wide parameter. This is because:

- Estimating gamma as a market-wide (or industry-wide) parameter is consistent with the concept of estimating WACC parameters on a benchmark basis, which intentionally seeks to abstract away from the circumstances of individual firms.

- The rules require the inclusion of a 'corporate' income tax building block within the building block revenue requirement.[344] A company structure is the most common form of business structure in the economy.[345] Accordingly, estimating gamma as a market-wide parameter is consistent with the specification of the benchmark efficient entity as a company. In contrast, among electricity networks and gas pipelines, trusts (or 'stapled' structures combining companies and trusts) are common forms of business structure.[346] We could not estimate gamma on an industry-wide basis and be internally consistent within the tax building block. This is because it would be adopting the tax rate appropriate for companies but then adjusting that tax rate for gamma based on data appropriate for trusts. Estimating gamma as a market-wide parameter is therefore both internally consistent and consistent with the rule provision governing the estimation of the corporate income tax building block.

- A wider benchmark can improve the strength of the payout ratio and utilisation rate estimates due to larger sample sizes and lower sensitivity to peculiarities of the sector at a point in time.

- Stakeholders supported estimating gamma as a market-wide parameter.[347]

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[342] AER, *Final decision: WACC review*, May 2009, p. 421.
[343] ENA, *Submission to the consultation paper*, June 2013, p. 82.
[344] NER, r. 6.5.3; NER, r. 6A.6.4; NGR, r. 87A.
[345] In particular, this observation is based on the number of taxpaying entities by type excluding individuals. See: ATO, *Taxation Statistics 2010–11—A summary of tax returns for the 2010–11 financial year and other reported tax information for the 2011–12 financial year*, April 2013, p. 4. Available at: http://www.ato.gov.au/uploadedFiles/Content/CR/Research_and_statistics/In_detail/Downloads/cor00345977_2011CH1SUM.pdf
[346] For example: APA Group is a stapled trust comprised of the Australian Pipeline Trust and the APT Investment Trust; Spark Infrastructure issues securities through Spark Trust; Duet Group issues securities as a stapled trust.
[347] ENA, *Submission to the consultation paper*, June 2013, p. 82.

### 8.3.4 The payout ratio

We consider the cumulative payout ratio method produces a reasonable estimate of the payout ratio. This is based primarily on the empirical estimate of the cumulative payout ratio in the report provided by NERA. The cumulative payout ratio is an estimate of the average payout rate from 1987–88, when the imputation system began, to the latest year for which tax data is available, which in NERA's report is 2010–11. It is consistent both with the value the ENA proposed, which is based on the NERA report, and with the value the Tribunal previously determined.[348] With current evidence, this method suggests a value of 0.7.

The payout ratio is the proportion of imputation credits that the benchmark company or market distributes, out of the total credits it generates.[349] For example, if a company generates $100 of imputation credits and distributes $80 of imputation credits, its payout ratio for that year is 0.8. Since Australian companies generate $1 of imputation credits per $1 of tax they pay, this is equivalent to the value of imputation credits distributed divided by the total value of company tax paid.

NERA estimates the cumulative payout ratio from 1987–88 to 2010–11 as 70 per cent, or 0.7.[350] This method starts with the total value of franking credits that are in firms' franking account balances, reflecting the cumulative additions and subtractions of franking credits since the commencement of the imputation tax system. Then, subtracting this from total company tax paid over the same time period produces an estimate of the franking credits that have been distributed in total. This relies on the idea that every dollar of company tax paid generates an imputation credit, which can either be distributed or retained in franking account balances. Then, dividing this estimate by company tax paid to the ATO over the same time period produces an estimate of the total payout ratio over this time.

We consider this is a reasonable estimate of the payout ratio. This is because:

- the method is aligned with the conceptual framework

- it is simple and intuitive

- it is based on long-term data from a reliable source

- this approach has wide support from experts and stakeholders.[351]

However, we consider there is evidence to suggest it may be rising over time.[352] Notwithstanding the above, we consider that a payout ratio of 0.7 is more likely to understate than overstate a forward looking payout ratio. This is because:

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[348] ENA, *Submission to the consultation paper*, June 2013, p. 83; ENA, *Response to the AER's rate of return guidelines consultation paper, Attachment 12: The Payout Ratio, NERA*, 28 June 2013, p. ii; Australian Competition Tribunal, Application by Energex Limited (Distribution Ratio (Gamma)) (No 3) [2010] ACompT 9 (24 December 2010), para 4.

[349] Strictly, under the Officer model the payout ratio is a firm specific measure. However, Lally recommends that for practical reasons and to create appropriate regulatory incentives, the payout ratio should be set using a market wide average. Lally, *The cost of capital under dividend imputation: Prepared for the Australian competition and consumer commission*, June 2002, p. 19.

[350] ENA, *Response, Attachment 12: The Payout Ratio, NERA*, June 2013, June 2013, p. ii.

[351] N. Hathaway, *Imputation credit redemption: ATO data 1988–2008, Capital research Pty Ltd report*, July 2010, p. 7; ENA, *Response, Attachment 12: The Payout Ratio, NERA*, June 2013, p. ii; ENA, *Submission to the consultation paper*, June 2013, p. 83; Australian Pipeline Industry Association (APIA), Response to the AER's rate of return guidelines *consultation paper*, June 2013, p. 40; Major Energy Users (MEU), *Response to the AER's rate of return guidelines consultation paper*, June 2013, pp. 49–50; The Financial Investor Group (FIG), *Response to the AER's rate of return guidelines consultation paper*, 24 June 2013, pp. 35–36; Citipower, Powercor and SA Power Networks, Response to the AER's rate of return guidelines consultation paper, 28 June 2013, p. 9.

[352] See appendix K.

- Using the same data-set as NERA, we have re-calculated the cumulative payout ratio from 2002–2003 to 2010–11. This produces an estimate of 0.73. However, tax data is often adjusted for several years after publication, so we are cautious about placing significant weight on shorter, more-recent samples.

- Recent corporations law amendments in 2010 make it possible for firms to increase the payout of dividends. Previously, companies could only distribute dividends out of profits. However, these amendments to Corporations Law 245T allow companies to pay dividends out of assets subject to conditions.[353] This allows these firms to increase their payout of dividends. The payout of dividends constrains the payout of imputation credits, because imputation credits can only be distributed with dividends. Accordingly, if firms use the additional flexibility to increase dividends, it may also increase the distribution of imputation credits (and therefore the imputation credit payout ratio).

- Experts have identified that it appears unlikely franking account balances can increase indefinitely without corporate or legislative innovations to access this value.[354] The ENA observes that whether or not this theoretical argument is valid, the long run payout ratio remains at 0.7.[355] We consider the theoretical observation does remain valid, but accept that the empirical evidence generally points to a payout ratio of 0.7. Also, as the ENA's preferred estimate is based on a long term cumulative average, an increasing trend of the payout of dividends would necessarily take a number of years to influence the average.

### 8.3.5 The utilisation rate

The utilisation rate is the before-personal-tax reduction in company tax per $1 of imputation credits that the representative investor receives. For this proposed guideline, we consider the utilisation rate should be based on the body of utilisation rate estimates with regard to its strengths and weaknesses. This includes the equity ownership approach, tax value studies and implied market value studies. With current evidence, we consider this suggests an utilisation rate of 0.7. This is a departure from the current value for the utilisation rate. The Australian Competition Tribunal determined that the utilisation rate should be 0.35.[356] The estimate was based on a single dividend drop off study.

In reaching our view, we have re-examined:

- the operation of imputation credits and how investors use them

- the representative investor and observed utilisation estimates

- the utilisation rate as a proportion of tax cash flows

- sources of evidence for the estimate—including the 'equity ownership' approach, tax statistic estimates, and various implied market value estimates.

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[353] Deloitte, *Changes to corporate law rules for payments of dividends*. September 2010. Available at: http://www.deloitte.com/assets/Dcom-Australia/Local%20Assets/Documents/Services/Tax%20services/Corporate%20and%20international%20tax/Alert%20on%20Dividends%20JC%20060910.pdf

[354] For example: D.L. Handley, *Further comments on the valuation of imputation credits*, April 2009, p. 8; McKenzie and Partington on behalf of the Securities Industry Research Centre of Asia Pacific (SIRCA) Pty Ltd, *Report to the AER—Evidence and submissions on gamma*, March 2010, pp. 26–27; M. Lally, 'Regulation and the cost of equity capital in Australia', *Journal of law and financial management*, Vol. 2, No. 1, November 2003, p. 33.

[355] ENA, *Submission to the consultation paper*, June 2013, pp. 83–85.

[356] Australian Competition Tribunal, *Application by Energex Limited (Gamma) (No 5) [2011] ACompT 9,* May 2011, para 42.

## The operation of imputation credits and how investors use them

To inform our analysis of the value of imputation credits, we considered the basic operation of the imputation tax system to identify how imputation credits create value for investors.

### How and when are they made?

When Australian companies pay tax, they generate imputation credits of equal value. That is, $1 of Australian company tax generates $1 worth of imputation credits.

### How do they get from companies to investors?

Companies periodically distribute earnings to shareholders through dividend payments. If they have imputation credits in their franking accounts, they may 'attach' these imputation credits to the dividends and distribute them as 'franked dividends'. However, they do not have to distribute all or even any of their franking credits. If companies choose to retain franking credits in their franking account balance, they can do so. Further, imputation credit distributions are constrained as follows:

- fully franked dividends include imputation credits that are 42.8 per cent of the dividend's face value[357]

- all dividends in a distribution during a 'franking period' must be equally franked. This is called the benchmark rule.[358]

### How do investors use the credits?

For an investor who is eligible to use imputation credits, their taxable income includes both the face value of the dividends and the face value of the imputation credits they receive. However, the imputation credits also reduce their total tax liability by the face value of the credits. Whereas an additional $1 of imputation credits increases their tax liability commensurate with the investor's marginal tax rate, $1 of franking credits reduce the total taxes they owe by exactly $1.[359] So, before personal tax, investors claim back from the government the face value of imputation credits as a return. This is in addition to capital gains and dividends.

However, not all investors are eligible to redeem franking credits. A detailed list of eligible classes of investors is set out in appendix K. In general, individuals, trustees, life insurance funds and superannuation funds and some charities are eligible to redeem credits.[360] In contrast, other companies are ineligible to redeem credits. Companies that receive credits from investment in other companies store these credits in their own franking account balances, for possible future distribution. Then, there are other requirements governing eligibility to redeem imputation credits. Importantly, only resident investors are eligible.

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[357] This is because the value of credits generated within a year is limited by the company tax rate and dividends are distributed from post-tax income (1-company tax rate). So, a fully franked dividend includes imputation credits to 0.3/(1-0.3) = 42.8 per cent of its face value.

[358] Private companies have one franking period per year, and non-private entities with a 12 month income year have two six-month franking periods per year. See: ATO, *Imputation: The benchmark rule*, Available at: http://www.ato.gov.au/Business/Imputation/In-detail/Dividends---imputation/Reference-guide/Imputation-reference-guide/?default=&page=44#The_benchmark_rule

[359] For example, $1x 0.45 = $0.45

[360] ATO, *Imputation: Refunding excess imputation credits snapshot view*, Available at: http://www.ato.gov.au/Business/Imputation/In-detail/Refunding-excess-imputation-credits-snapshot-view/

Investors must also meet a holding period rule aimed at minimising tax avoidance. Investors have to continuously hold shares 'at risk' for at least 45 days (90 days for certain preference shares) around the time of the distribution to be eligible for the franking tax offset.[361] This rule only applies if an investor's total franking credit entitlement is above $5,000.[362]

## The representative investor and observed utilisation estimates

The relationship between the representative investor in the market and the implied representative investor from estimation methods (such as tax studies and dividend drop off studies) is critical in assessing:

- what we are trying to estimate

- which estimation methods are therefore fit for purpose.

To answer the question of the appropriate representative investor, we considered afresh:

- the Sharpe–Lintner CAPM framework under imputation as derived in Officer, Monkhouse, Lally and Van Zijl, and Lally[363]

- analysis of this conceptual framework by academic experts

- the construction of the corporate tax building block in the rules, and how this interacts with the Officer framework used within the rate of return.

Our analysis of these issues is set out in section 8.3.1, and further in appendix K. Having undertaken this analysis, we conclude that we did not fully adopt or address important aspects of this analysis during the 2009 WACC review. As a result, the Tribunal review focused only on the particular suitability of tax value studies and dividend drop off studies with an incomplete conceptual framework. The Tribunal acknowledged this incomplete framework at several points in its reasons.[364]

We conclude that the representative investor:

- is the weighted average of investors within the defined market, where the weightings reflect market participation (equity ownership value) and risk aversion.[365]

- in this context, the defined market is investors in Australian equity, either domestic or foreign

- is the representative investor at any hypothetical point during a trading year—that is, it does not disproportionately reflect an investor or set of investors at a particular point in time. This is because investors may invest at any point during the year. If a benchmark parameter is set using

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361 ATO, *You and your shares: 2012–13*, Available at: http://www.ato.gov.au/Individuals/Investing/In-detail/Receiving-interest-and-dividends/You-and-your-shares-2012-13/?default=&page=11

362 ATO, Imputation: What are the anti-avoidance rules? Available at: *http://www.ato.gov.au/Business/Imputation/In-detail/Refunding-imputation-credits--Overview/?default=&page=3#What_are_the_anti-avoidance_rules?*

363 R.R. Officer, 'The cost of capital of a company under an imputation tax system', *Accounting and finance*, Vol. 34, Iss. 1, May 1994, pp. 1–17; P.H.L. Monkhouse, 'The cost of equity under the Australian dividend imputation system', *Accounting and finance*, Vol. 33, Iss. 2, November 1993, pp. 1–18; M. Lally and T. van Zijl, 'Capital gains tax and the capital asset pricing model', *Accounting and finance*, Vol. 43, May 2003, pp. 187–210; M. Lally, 'The CAPM under dividend imputation', *Pacific accounting review*, Vol. 4, No. 1, December 1992, pp. 31–44.

364 We have summarised the Tribunal's commentary in appendix K.

365 See, for example: P.H.L. Monkhouse, 'The cost of equity under the Australian dividend imputation system', *Accounting and finance*, Vol. 33, Iss. 2, November 1993, pp. 1–18. ; M. Lally and T. van Zijl, 'Capital gains tax and the capital asset pricing model', *Accounting and finance*, Vol. 43, May 2003, pp. 187–210.

data from a short period in systematically different trading circumstances to the rest of the year, it produces an estimate that is only relevant to those circumstances.

Having reached this view, we consider it has important implications for the practical task of estimating the value of imputation credits. The most important implication of this relationship is that the source of evidence the Tribunal adopted for theta (a dividend drop off study) does not produce an estimate for the representative investor. This is because dividend drop-off studies give a market value for the value weighted investor's valuation:

- Based on the combined package of imputation credits, dividends, and other entitlements (unless adjusted for). That is, value for imputation credits is not available via simple observation of the dividend drop off in these studies. The implied values for the franking credit and the cash component must be econometrically separated, which is difficult to do reliably. We discuss this further in appendix K.

- For trades around the time of dividend distribution—that is, these studies only reflect trading around the cum-dividend and ex-dividend dates.

This is explained further below.

## Arriving at an estimate of the utilisation rate

For this draft guideline, we propose to estimate the utilisation rate using the body of relevant evidence with regards to its strengths and weaknesses, checked against a range of supporting evidence. That is, we will not seek to identify a definitive study, but rather to consider the range of expert estimates and opinions of the utilisation of imputation credits. This section addresses:

- the equity ownership approach—on current evidence this suggests an estimate of 0.7

- tax statistic estimates—on current evidence this suggests an estimate between 0.45 and 0.8

- implied market value studies—on current evidence this suggests an estimate between 0 and 1

- other supporting evidence—including observations about market practice, government tax policy, imputation equity funds.

Having considered all of these sources of evidence with regard to their strengths and weaknesses, we propose to apply an utilisation rate of 0.7. We further consider this approach is consistent with McKenzie and Partington's recommendation to 'triangulate' different sources of evidence.[366] Further, we consider that having regard to a range of evidence, tempered by an understanding of the strengths and weaknesses of each source of evidence, is good regulatory practice and results in a reasonable estimate. Based on these reasons, we consider an estimate of the utilisation rate of 0.7 promotes the rate of return objective.

### *The equity ownership approach*

Imputation credits are distributed from companies to investors. Eligible investors can then redeem these credits. Before personal tax, eligible investors claim back company tax by $1 per $1 of credit they receive. In contrast, ineligible investors reduce company tax by $0 per $1 of credit they receive.

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[366]   M. McKenzie and G. Partington on behalf of the Securities Industry Research Centre of Asia Pacific (SIRCA) Pty Ltd, *Report to the AER—Evidence and submissions on gamma*, March 2010, p. 4.

Therefore, if we estimate the value weighted proportion of eligible investors out of all investors in the Australian market, we have a conceptually sound estimate of the representative investor's expected utilisation rate. As described above, most domestic investors are eligible investors whereas foreign investors are ineligible investors. Based on information from the ABS, the most recent estimate is that 71 per cent of Australian equity is held by domestic investors.[367] Therefore, our starting point is that the representative investor's value weighted average utilisation rate is 0.7. However, through the guideline development process we will seek to update this estimate if possible.

This approach mirrors the principle in Lally's submission that if the Officer CAPM reflects a fully segmented (domestic) market, the utilisation rate should be set to 1 since nearly all domestic investors can redeem credits that are distributed to investors.[368] Further, since 2001, all eligible investors are guaranteed full utilisation of franking credits. Therefore, under our market definition, the market wide utilisation factor should be a weighted average of investors' expected eligibility to utilise imputation credits.

The Tribunal has not previously considered this approach because no party applied it during the 2009 WACC review or in subsequent decisions. We refer to this estimate as the 'the equity ownership' approach, and consider it is a reasonable estimate for the following reasons:

- The proportion of domestic investment in Australian equity is a good proxy for the value weighted average investor's eligibility to utilise franking credits. This is because:

    - in general, domestic owners of equity (who expect to hold shares for a full CAPM period) can utilise franking credits

    - conversely, foreign owners of Australian equity cannot utilise franking credits

    - the proportion of domestic ownership of Australian equity is therefore an average of investors that expect to be eligible to redeem franking credits weighted by their market value ownership

    - where investors redeem credits, company tax is reduced by $1 per $1 of imputation credit. This is because the redemption of credits transfers company tax from an expense to a return for investors.

However, under the Officer framework (or the alternative derivations in Lally and Van Zijl or Monkhouse), the weightings for the representative investor should account for both:

- the value weighting of each individual investor—that is, the proportion of equity in the market that they own

- the risk aversion of all investors—specifically, the expected return of each investor's portfolio divided by their expectations of variance in that portfolio.[369]

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[367] Australian Bureau of Statistics, *Feature article: Foreign ownership of equity*, Available at: http://www.abs.gov.au/AUSSTATS/abs@.nsf/Previousproducts/5302.0Feature%20Article10Sep%202007?opendocumen t&tabname=Summary&prodno=5302.0&issue=Sep%202007&num=&view

[368] M. Lally, *Review of parameters in the national electricity rules*, September 2007, p. 16. Similarly, in the Monkhouse derivation of the Sharpe-Lintner CAPM under imputation (1993), Monkhouse defines the after-personal-tax utilisation factor to an investor in terms of their ability to fully utilise the face value of franking credits ($\Theta_i^d$). Because Monkhouse is estimating an after-personal-tax utilisation rate, this is scaled to reflect the investor's marginal tax rate. Monkhouse then defines the representative 'weighted average investor' by summing across all investors in a particular ($j^{th}$) firm, which in this case is the Australian market. However, consistent with other parameters, we estimate the utilisation factor before personal tax and therefore do not need to scale the utilisation factor.

[369] Risk aversion is also in the weighting derivation in Monkhouse (1993) equation 4.8. P.H.L. Monkhouse, 'The cost of equity under the Australian dividend imputation system', *Accounting and finance*, Vol. 33, Iss. 2, November 1993, p. 10.

The equity ownership approach accounts for the first of these factors, but not for the risk aversion of all investors. We have considered whether it is practically possible to estimate this factor, and conclude that it is not. This is because it would require specific calculations or assumptions relating to the portfolios and risk preferences of all individuals or classes of investors. Because risk aversion is complex to measure or observe outside of its effects on prices, these calculations are unfeasible.

Further, there are also reasons to expect that the equity ownership approach may understate the true utilisation rate. This is because eligible investors, holding all else constant, are relatively more likely than ineligible investors to favour investments in firms that investors expect to pay highly franked dividends. We consider that the equity ownership approach produces a reasonable estimate of the value weighted average eligibility of the representative investor. However, the equity ownership approach assumes that the proportion of eligible investors will be distributed across firms that evenly distribute credits.[370] In practice, firms do not evenly distribute imputation credits. If eligible investors expect to disproportionately invest in companies that pay fully franked dividends, their expected utilisation rate should lie above the proportion of eligible investors.

We accept that these are potentially disadvantages with equity ownership approach. Nonetheless, we consider the equity ownership approach is a reasonable estimate because:

- It is well aligned with the conceptual framework as set out in sections 8.3.1 and 8.3.2.

- It is the only measure of the representative utilisation rates that is representative of the entire trading year.

- It is simple and intuitive.

- It is based on reliable data and calculations.

- Both tax value studies and implied market value studies are sensitive to trading around the cum-dividend and ex-dividend days. For dividend drop off studies in particular, this issue can critically affect the resulting estimate. This limitation, that affects other approaches, does not affect the equity ownership approach.

***Tax statistic estimates***

Tax statistic estimates are, in concept, closely aligned with the approach used in the 'equity ownership' approach. Specifically, they are an estimate of the expected reduction of effective company tax through the redemption of imputation credits. The major difference is that tax value studies reflect the final set of investors who redeem the credits. It is possible that some of these investors have traded specifically to receive the credits (tax arbitrage).

However, the evidence suggests that the magnitude of impact from this trading is not large. The range of tax statistic estimates is from 0.45 to 0.8 (Handley and Maheswaran), though three of the four estimates are 0.65 or above.[371] Further, the estimate of 0.45 was made using data almost exclusively prior to the changes to the tax law that guaranteed full refund of imputation credits to eligible investors.[372] These are also the three most recent estimates. Therefore, on balance, we consider the tax statistic estimates and the equity ownership approach suggests a value of approximately 0.7. We

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[370] This is evident in the different franking proportions observed in dividend drop off studies.
[371] N. Hathaway and B. Officer, *The value of imputation tax credits: Update 2004*, November 2004, p. 8; J.C. Handley and K. Maheswaran, 'A measure of the efficacy of the Australian imputation tax system', The economic record, Vol. 84, No. 264, March 2008, pp. 82–94.
[372] N. Hathaway and B. Officer, *The value of imputation tax credits: Update 2004*, November 2004, p. 4.

discuss the tax statistic estimates in more detail in appendix K. The estimates using the equity ownership approach and the range of tax statistic estimates are close, which strengthens our confidence in both of the estimates.

In the Tribunal's review of the value of imputation credits, the Tribunal determined that tax value studies were an 'upper bound' for theta and not relevant for estimation of the utilisation rate. We consider this arose from the conclusions that:

- only the 'market value' of the utilisation rate is a relevant conceptual goal

- dividend drop off studies accurately identify the market value of imputation credits

- therefore, the differences between the implied market value from dividend drop off studies and tax statistic estimates were assumed to be costs to investors that the utilisation rate did not identify.

In turn, we consider these conclusions arose from the incomplete conceptual framework. For the reasons discussed below and in appendix K, we consider that both of these conclusions are incorrect.

Further, during the Tribunal process the AER commissioned a report from McKenzie and Partington who addressed some of these issues.[373] In particular, McKenzie and Partington identified that 'taxation statistics do not give an upper bound on either the market value of franking credits, or the utilisation rate of the marginal investor'.[374] Since some of this analysis lay outside the scope of information we used in the relevant final decision, we did not seek to rely heavily on the report in the Tribunal review. Nonetheless, the Tribunal recognised that:[375]

> By way of background, the Tribunal in earlier reasons noted that the AER accepted that tax statistics studies provide an upper bound on possible values of theta. The AER in its report, while being less unequivocal than SIRCA, adopts SIRCA's suggestion that the results of tax statistics studies (now called the redemption rate) could be discounted for factors such as the time between the distribution and the redemption of imputation credits. These adjustments "would need to be made on an economically justifiable basis". The AER referred to a 2004 study by Hathaway and Officer as being an example of such a use of an estimate of the utilisation rate.

> Beyond these observations, the AER does not seek to adduce material from SIRCA's March 2011 report to advance its submissions. On the material before it, the Tribunal is unable to reach any conclusions about the further use of tax statistics studies in estimating the utilisation ratio, theta. No doubt the AER will in the future have opportunity, and perhaps cause, to investigate further. It has not sought to do so in these proceedings.

However, if tax arbitrage influences the final set of investors at the ex-dividend date, the estimates from tax statistics may lie above the estimate from the equity utilisation approach. This is because the eligible investors have some incentives to trade, if at all, to acquire more imputation credits. If this happened, the actual utilisation rate may increase beyond the expected utilisation rate from the equity ownership approach. For this reason, we have relied on the equity ownership approach for the primary estimate and the tax statistic estimate as a reasonableness check.

Further, beyond the conceptual debate about the use of tax value studies, Hathaway published a critique of the Handley and Maheswaran estimates and concluded that tax statistics should not be

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[373]  M. McKenzie and G. Partington, *Report to the AER—Response to questions related to the estimation and theory of theta*, March 2011.

[374]  M. McKenzie and G. Partington, *Report to the AER—Response to questions related to the estimation and theory of theta*, March 2011, pp. 14–15.

[375]  Australian Competition Tribunal, *Application by Energex Limited (Gamma) (No 5) [2011] ACompT 9,* May 2011, paras 33–34.

used to estimate the utilisation rate.[376] Handley responded to these criticisms in detail and maintained that the 2008 estimate was reasonable.[377] We accept that in this case there is debate between experts about the best implementation of the available tax statistics to estimate the utilisation rate. However, we do not agree with Hathaway's conclusion that these potential problems mean that tax value statistics should not be used to estimate the utilisation rate. This is because:

- the estimate of the redemption rate is well aligned with the conceptual framework as set out in sections 8.3.1 and 8.3.2

- in our view, the implied market value approaches are affected by more critical data and method issues, as described below and in appendix K.

*Implied market value estimates*

Dividend drop off studies are a member of a class of evidence that are referred to as implied market value studies. In general, implied market value studies seek to infer a value for imputation credits using a price differential for a security including the imputation credit entitlement, and the same security without the imputation credit entitlement. The current estimate of the utilisation rate (0.35) was reached using a dividend drop off study. However, as discussed in the consultation paper, these studies are all affected by similar shortcomings. We consider that implied market value studies are unlikely to produce an accurate estimate of the market value of imputation credits for the representative investor, because:[378]

- There is substantial evidence suggesting that trading around the ex-dividend and cum-dividend days is not representative of the rest of the year.[379] This is a significant problem, because all dividend drop-off data comes from trading on the cum-dividend day and ex-dividend day. This is different to all other market-based equity evidence (such as used for equity beta, MRP) which draws on trading throughout the year.

- The value of franking credits is not independently observable.[380] In all dividend drop off studies, an estimate of the implied value of imputation credits requires econometric separation of the value of dividends from the value of franking credits. While there are econometric techniques available to do this, the nature of the imputation credit data means applying these techniques to imputation credits is particularly problematic. We discuss these problems further in appendix K.

- The wide range of implied market value estimates and the high sensitivity of the SFG estimate to input and specification choices means it is difficult to select a definitive 'implied market value' to

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[376] N. Hathaway, Comment on: *"A measure of the efficacy of the Australian imputation tax system" by John Handley and Krishnan Maheswaran*, July 2010.

[377] D.L. Handley, *Further issues relating to the estimation of gamma*, October 2010, pp. 21–34.

[378] We discuss all these issues in greater detail in appendix K.

[379] For example: E. Rantapuska, 'Ex-dividend day trading: who, how and why? Evidence from the Finnish market', *Journal of financial economics,* Vol. 88, Iss. 2, May 2008, pp. 355–374; A.B. Ainsworth, K.Y.L. Fong, D.R. Gallagher and G. Partington, 'Institutional trading around the ex-dividend day', *21st Australasian finance and banking conference paper*, March 2011, p. 29; D.E. Bellamy, *An analysis of ex-dividend abnormal trading volumes and share price changes in the Australian equity market, PhD thesis, School of Business*, The University of Queensland, 2002; M. Frank and R. Jagannathan, 'Why do stock prices drop by less than the value of the dividend? Evidence from a country without taxes', *Journal of financial economics*, Vol. 47, No. 2, February 1998, pp. 161–188.

[380] M. McKenzie and G. Partington on behalf of the Securities Industry Research Centre of Asia Pacific (SIRCA) Pty Ltd, *Report to the AER—Evidence and submissions on gamma*, March 2010, p. 12.

compare it against. [381]   We are aware of credible studies by respected experts supporting utilisation rates between 0 to greater than 1 (more than face value).[382]

- Implied market studies are also affected by tax arbitrage for the same reasons as tax statistic estimates.

Therefore, we consider that implied market value studies are of limited value to the task of estimating the utilisation rate for valuation. This is because they do not produce an estimate for the representative investor. Further, even if implied market value estimates were conceptually appropriate, there are significant limitations with the accuracy and robustness of such studies. Specifically, there is good reason to expect that dividend drop off studies do not produce an accurate estimate of the market value due to their reliance on two days of trading in unusual trading circumstances. As a result, we consider there is insufficient evidence to conclude that the 'true' implied market value for the representative investor is significantly different from the utilisation rate estimated through the equity ownership approach and tax statistic estimates.

To this effect, McKenzie and Partington (2010) observe that:[383]

> It is clear that a precise and unambiguous valuation of theta is unlikely to be derived from traditional ex-dividend studies. It would be unwise, therefore, to rely on one ex-dividend study to determine theta (the utilisation rate). Equally, it would be unwise to just rely on combining results across several ex-dividend studies; triangulation with other evidence is desirable.

In contrast, the Australian Competition Tribunal relied on a single study from this single class of evidence in reaching its decision on the utilisation rate.[384] We consider this leads to an outcome that does not promote the long term interests of users of electricity or natural gas. This is a significant factor in our proposal to depart from the Tribunal's estimate.

### *Other supporting evidence*

Aside from the empirical estimates detailed above, we have considered whether observed policy decisions and market behaviours suggest that investors obtain significant, little or no value from imputation credits. This type of information is not precise enough to imply a specific estimate, but may be able to inform broad observations about the apparent value. In particular, we have considered:

- the KPMG 2013 valuation practices survey

- the ongoing participation of equity imputation funds.

- Government tax policy to 'close the loophole' for dividend washing

On balance, we consider this evidence suggests that it is reasonable to conclude that imputation credits have significant value to investors. We have not relied on this information to determine a specific value, but this information is consistent with the significant and positive estimate for gamma we have applied.

*The KPMG 2013 valuation practices survey*

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[381]   We discuss this in greater detail in appendix K. Economic Regulation Authority, *Explanatory statement for the draft rate of return guidelines: Meeting the requirements of the National Gas Rules*, August 2013, pp. 201–205.

[382]   See appendix K.

[383]   M. McKenzie and G. Partington on behalf of the Securities Industry Research Centre of Asia Pacific (SIRCA) Pty Ltd, *Report to the AER—Evidence and submissions on gamma*, March 2010, p. 11.

[384]   Australian Competition Tribunal, *Application by Energex Limited (Gamma) (No 5) [2011] ACompT 9,* May 2011, para 29.

The task of estimating the value of imputation credits within the building block revenue framework is primarily guided by the NER/NGR and the NEL/NGL. However, the ENA submitted that it is also relevant to consider actual market practice relating to the valuation of imputation credits.[385]

The KPMG 2013 valuation practices survey included 23 market participants across a range of industries. These were made up of six investment banks, six professional services firms, six infrastructure funds and five other participants. Regarding imputation credits, the survey's key conclusions were as follows:[386]

▪ There is no agreed estimate or method to estimate the value of imputation credits.

▪ For business enterprise valuations other than infrastructure projects, 53 per cent of participants assigned some value to imputation credits.

▪ For infrastructure projects, 94 per cent of participants assigned some value to imputation credits. In particular, 59 per cent of respondents include imputation credits in the cash flows at an assumed utilisation rate.

▪ As identified by KPMG, 'there was a wide spread of responses on the utilisation of franking credits, but ultimately a clear concentration, with 53 per cent of participants using 70–80 per cent of the benefit'.

Based on this survey, we conclude that there is no consensus amongst market practitioners on how to value imputation credits, or what value to assign to them. Further, the respondents valued imputation credits differently depending on the sector of the project. In contrast, we are estimating a market wide benchmark. Therefore, we are cautious in drawing strong conclusions based on sector specific analysis. However, on balance, we consider it is reasonable to conclude that:

▪ the value of imputation credits can be estimated using the utilisation of imputation credits within the cash flows

▪ where it is applied, market practitioners support a utilisation value that is concentrated around 0.7–0.8.

In contrast, the ENA's submission refers particularly to valuation surveys considered in the WACC review in 2009. In these surveys, the majority of respondents identified that they did not estimate the value of imputation credits when undertaking valuations. During the WACC review, we identified that this does not lead to the conclusion that imputation credits have no value.[387] Recently, the ERA adopted this same view in its decision on the Dampier to Bunbury natural gas pipeline (DBNGP). In its review of this decision, the Tribunal affirmed that even if market practitioners include no value for imputation credits, this does not imply that imputation credits have no value to investors. The Tribunal observed that this was a 'necessary response to the realities of estimation'.[388]

*The ongoing participation of equity imputation funds*

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[385] ENA, *Submission to the consultation paper*, June 2013, p. 91.
[386] KPMG, *Corporate finance: Valuation practices survey*, April 2013, pp. 26–28
[387] AER, *Final decision: Electricity transmission and distribution network service providers review of the weighted average cost of capital (WACC) parameters*, May 2009, pp. 404–410.
[388] Australian Competition Tribunal, Application by DBNGP (WA) Transmission Pty Ltd (No 3) [2012] ACompT 14, July 2012, Para. 225.

Many major investment brokers offer managed funds that focus exclusively on investing in firms with a high imputation credit payout ratio.[389] While our informal survey suggests that these funds maintain other prudent risk management criteria, the focus on imputation credits is a core component of the operation of the funds. It appears unlikely that investment managers would offer these managed funds products unless they either:

▪ View imputation credits as offering significant value to investors; or

▪ Consider the market undervalues imputation credits. This means that by investing in firms with a high franking credit payout ratio at the market price, the managed funds expect that they can earn arbitrage returns because the actual value of imputation credits exceeds the implied market price.

We recognise that this is indirect evidence on the extent to which investors utilise imputation credits and therefore reduce the effective company tax paid. We have therefore not relied on this observation in reaching the specific value of our estimate. However, it does supplement a body of evidence suggesting that the market perceives significant value for investors from the utilisation of franking credits.

*Government tax policy to 'close the loophole' for dividend washing*

The Australian government announced in its 2013–14 budget that it will close a loophole that allows some investors to access double portions of imputation credits through a series of sophisticated trades in a process called 'dividend washing'.[390] This process operates as follows:[391]

> 'Dividend washing' refers to transactions where  investor X who holds a parcel A of shares in a listed public company Z sells those shares just before it goes ex-dividend (the right to the dividend and any franking credits remains with the seller). Investor X immediately purchases another parcel B of shares in company Z, equivalent to the shares in A, in the cum-dividend market (the right to the dividend and any franking credits remains with the buyer). Historically, a rule of the market has allowed a two-day period for settlement of option trades which has been exploited by sophisticated investors to buy shares which carry a dividend to claim two sets of franking credits.

> Under current tax law, investor X could claim franking credits in relation to the shares in A as well as franking credits in relation to the shares in B. The measures proposed in the budget will result in investor X being able to claim only one set of franking credits. The Budget paper also indicated that the proposed changes will target the two-day period after a share goes ex-dividend.'

The Australian government forecasts that this will increase tax revenue (decrease the reduction of company tax through imputation) by $20 million per year from 2013–14 to 2015–16. This is a small proportion of the total utilisation of imputation credits. However, it suggests that some investors are willing to engage in complex trading to access imputation credits. In turn, this suggests that imputation credits are significantly valuable to these particular investors.

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[389] Our non-comprehensive survey indicates that fund managers such as ANZ, BT Wholesale Investment Funds, Colonial First State all offer wholesale imputation investment funds.
[390] Australian Government, *2013-14 budget– Part 1: revenue measures continued*, Available at: http://www.budget.gov.au/2013-14/content/bp2/html/bp2_revenue-10.htm
[391] Parliamentary library, *Measures to minimise exploitation of franking credits by 'dividend washing'*, May 2013,  Available at: http://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/BudgetReview2013 14/FrankingCredits

# A  Summary of submissions and CRG response

This appendix includes a summary of submissions received in response to our consultation paper (Table A.1). It also includes a summary of verbal submissions from the CRG (Table A.2).

**Table A.1**  **Summary of submissions on the rate of return consultation paper**

| Issue | Comments |
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| Do stakeholders agree with our proposition that we should continue to determine the rate of return by ultimately selecting point estimates (possibly from within ranges) of the return on equity, the return on debt, and gearing?<br><br>For parameter estimates, should we adopt point estimates, ranges, or point estimates from within a range?<br><br>At what stage (during a determination or the guidelines process) should point estimates or ranges of the return on equity, return on debt and parameter estimates, be established? | **ENA:** Supports selecting point estimates from within a range. (The ENA did not address this question directly, however, their proposed approach selected a point estimate from within a range).<br><br>**APIA:** No, parameter estimates should be ranges with a rigorous statistical basis. Point estimates should only apply to the final cost of equity and cost of debt, and as a critical value in a hypothesis test, not an A equals B type statement.<br><br>**Envestra:** It is reasonable to select point estimates (from within ranges) of the return on equity, return on debt and gearing, as long as these are informed by market circumstances, all available financial models, estimation methods and other data-evidence as required. Envestra seeks further definition of how the AER will determine point estimates in practice, to ensure that uncertainty associated with specific financial parameters is considered. Point estimates needs to be adopted from within a range; the reasoning must be rigorous, objective and auditable The AER should not pre-specify point estimates, ranges or weighting of evidence in advance because market conditions can change suddenly. Evidence must be considered during the assessment and not prior.<br><br>**PIAC:** Providing a range for the parameters provides the AER with more flexibility to exercise regulatory discretion. The six–step approach, means that where the AER finds the overall WACC is not largely consistent with other evidence, then the AER should look back to the parameters and model specifications. Having an initial range (with supporting material) will facilitate this process. PIAC therefore suggests the AER adopt point estimates from within a range for each relevant parameter, where this range is established through transparent and repeatable processes. The Guideline should set out where it is appropriate to fix parameters, like the gearing ratio and equity beta for each major sector, as point estimates to apply across multiple determinations. The point estimates for the cost of debt and cost of equity should be calculated and updated in the determination process.<br><br>**MEU:** Setting the five point estimates (risk free rate, market risk premium, equity beta, debt risk premium and gearing) will lead to an increased level of conservatism in the final calculation. The MEU considers that the final output should be a range which is then benchmarked to ensure that the 'correct' outcome is set rather than following a mechanistic approach that is implied by using various point estimates in the final calculation. The guidelines should clearly identify the framework for developing the rate of return, including the basis for developing, calculating and using the outcomes of different models and checks. Parameters with longer-term validities (MRP, equity beta, debt portfolio terms) could be set at each three year WACC review at the same time as the guideline review. Parameters with short term validities should be set at each reset, as should benchmark analyses.<br><br>**EUAA:** Disagrees with the AER approach to use point-estimates, possibly from within a range. This is because adding the point estimates of parameters won't necessarily deliver a WACC that represents the appropriate point in the range. This is because the whole may not equal the sum of its parts. Further, there is value in the AER communicating the plausible range for the WACC, not just the plausible range for each WACC parameter.<br><br>**COSBOA**: Supports the use of point estimates of the rate of return, return on equity, return on debt and gearing ratio. However, these should be subjected to reasonableness checks and adjusted as necessary where they are not reasonable. Support publishing ranges as this would be informative, including to consumers. COSBOA claims, there while it normally favours point estimates, they also recognise that this may not always be desirable. Where the AER decides that the best approach is to make partial or total use of ranges, it should clearly set out the reasons for this so that the use of ranges is transparent. |

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| What is the appropriate term for the return on equity?<br><br>Do stakeholders support Lally's recommendation based on the present value principle that the appropriate term should be consistent with the regulatory period? | **ENA:** A 10 year risk-free rate, using annualised contemporaneous yield on 10-year CGSs as a proxy, is consistent with theory and observed financing practice. The historical average MRP should be estimated using this term for consistency.<br><br>There is no legal basis for Lally's suggested NPV=0 principle. Further, the mathematical way to express the principle of the NPV of revenues being sufficient to cover service providers' efficient expenditure should be NPV ≥0.<br><br>**APIA:** The appropriate term for the cost of equity is ten years. Lally's net present value principle is irrelevant.<br><br>**Envestra:** A 10 year term is appropriate for deriving a return on equity. Energy assets have long lives, and an appropriate term for the rate of return should, in theory, match the economic life of those assets. A 10 year term is more in line with commercial practice. Envestra does not accept Lally's recommendation. The present value has no basis in the NGR or broader energy market legislation. Any increments to allowed revenue flowing from the efficiency carryover mechanism would violate the NPV=0 objective. This principle is not applied in commercial practice. It has not relevant to the rate of return objective.<br><br>**ActewAGL:** Does not consider it feasible to accurately estimate a term structure for equity returns, though in principle the term would match that for debt – that is, a 10 year maturity, consistent with the long lives of the assets and the business as a going concern.<br><br>**FIG:** The appropriate term for the return on equity should be consistent with the life of the underlying assets. The considerations made by the Tribunal in the GasNet appeal remain relevant – this resulted in a 10 year term. FIG believes the present value principle should not be required regulatory practice, as it is not referenced in the allowed rate of return objective, NGO, NEO or revenue pricing principles (which are to guide the interpretation of the allowed rate of return).<br><br>**RARE:** Given the long asset life, having longer terms would more closely match assets to liabilities. Supports longer-term measures of the risk free rate (10 years plus rather than 5 years).<br><br>**MEU:** Agree with Lally's recommendation.<br><br>**CitiPower, Powercor and SAPN:** A term to maturity assumption of 10 years continues to be appropriate.<br><br>**COSBOA:** In absence of information to the contrary, COSBOA would be inclined to follow Lally's advice of matching the term to the 5 year regulatory period. |
| What is the appropriate term for the return on debt? Do stakeholders agree with the view that a specific term is not required, if we apply an approach that is similar to the ERA's 'bond-yield approach'? Is there a case for the same term for the return on equity and return on debt? | **ActewAGL:** Supports a long-term horizon (10 year) for the cost of debt, as it is consistent with the long-lived nature of regulated assets and the AER's previous approach. Matching the term to the length of the regulatory period distorts efficient market outcomes and can induce inefficient financing costs and risks.<br><br>**APIA:** Ten years continues to be a reasonable benchmark for cost of debt. PWC/Incenta estimates that the average term of debt at issue for ASX listed regulated energy business at 10 years and longer terms for US and UK businesses. Shorter term creates costs associated with the need for more frequent refinancing that exposes the business to potential insolvency.<br><br>**CitiPower, Powercor, SAPN:** 10 years continues to be appropriate as it should reflect the average term of debt issuance for businesses with benchmark characteristics. ENA and its expert reports found the average term at issuance for Australian regulated energy networks is just over 10 years.<br><br>**ENA:** A benchmark term of debt at issuance should be at least 10 years. PwC estimates the average term of debt at issue for ASX listed regulated energy businesses to be 10.2 years and longer for US and UK regulated network businesses. CEG arrives at consistent estimates. While IPART and the ERA assumed a term of debt issuance of 5 years to match the term of the regulatory period, they fail to recognise transaction costs.<br><br>**Envestra:** Supports to maintain an average maturity of at least 10 years, it is also appropriate for deriving a trailing average return on debt. PC's inquiry into Electricity Networks Regulatory Frameworks has endorsed the use of a 10 year trailing average to set the cost of debt. A specific benchmark term for debt and credit rating are required, ERA's 'bond-yield approach' has a number of flaws, thus should not be used by the AER. |

**NSW DNSP**: Support a benchmark term to maturity of 10 years with equal weighting for each year in the measurement period.

**PIAC**: There are reasons for choosing either a five year or a 10 year term for the debt. A longer term horizon would be more consistent with the long term interest of both consumers and investors and also appear to be more aligned with the long tenor of most of the service provider's debt portfolios. However, there is also merit in applying a 5-year debt term that is aligned with the regulatory period as it minimises the risk of significant spread emerging between the actual and the allowed rate of return. The issue may come down to the practicalities of each approach.

**QTC**: A 10-year term for the return on debt continues to be appropriate for a benchmark service provider with long-lived assets and above market average gearing. A firm's refinancing risk exposure is directly related to the average tenor of debt that is issued to refinance each maturing debt. A specific debt term is essential regardless of the method used to estimate the value of the debt benchmark. Treating the debt term as an output effectively allows it to be determined by factors such as data availability or the particular choice of debt issues to be used in the estimation process.

**RARE**: Supports a longer term (10 year plus) for debt, given the long asset life of T&D networks.

**SP AusNet:** The benchmark efficient term of debt should remain at 10 years.

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| Should we make annual adjustments to the return on debt?<br><br>How should we address the issues regarding annual updating of the return on debt estimate? | **APIA:** Supports annual updating as a true-up mechanism would create potential for price shocks. Annual adjustment should be relatively easy to include in the annual price variation approval process.<br><br>**CitiPower, Powercor, SAPN:** The trailing average should be updated annually, such it closely reflects benchmark efficient costs. True up is the second best alternative.<br><br>**ENA:** Revenue allowance should be updated annually for businesses using trailing average approach. True-up is associated with large price increases, therefore there is no potential benefit from implementing it. No annual update will expose investors and businesses to the same under/over recovery of efficient costs that exists under the on the day approach. All data required to apply annual updating will be collected in the process of estimating trailing average, therefore there is no additional difficulty for the regulator to implement it.<br><br>**Envestra:** On the day approach does not require any annual adjustment. Trailing average requires an annual adjustment mechanism to facilitate smooth price transitions and hedgability of gas service providers' debt portfolio in line with the benchmark. It also reduces price volatility for consumer benefit. The updating approach needs to be specified in the access arrangement and be able to update automatically as part of the annual tariff review process.<br><br>**EUAA:** This is an empirical issue and note the difference in the views set out by CEG and QTC. Not yet formed a view.<br><br>**MEU:** Annual adjustment does not add an onerous imposition and will provide a smoother price path. It is more reflective of the actual cost.<br><br>**NSW DNSP:** Annual update is necessary to maximise the benefits of the trailing average approach as it provides strong incentives for regulated businesses to issue debt on a staggered basis and reduces refinancing risk. Regulated businesses will still attempt to lock in the cost of debt at the start of the regulatory period in absence of annual update and consumers would miss out if cost of debt decreases. Annual update ensures that changes in the efficient cost of debt are reflected in regulated revenues throughout the regulatory period and it is in the interests of both service providers and consumers.<br><br>**PIAC:** Supports arguments put forward by the RDB paper, no annual adjustments are required.<br><br>**QTC:** Annual updates are essential to proper application of a portfolio approach where a |

percentage of the existing debt portfolio is regularly refinanced at the prevailing rate. QTC's own simulation analysis suggests, in the context of a growth environment, the amount of debt on issue is likely to increase over time, the potential for material differences between a service provider's efficiently incurred debt financing costs and the return on debt during each regulatory period is significant. Therefore it does not support the self-correcting mechanism presented in the RDB paper for no annual update. Instead of recalculate CPI-X profile every year, an alternative approach would be to calculate the expected revenues for each year in the regulatory period based on the benchmark return on debt for year one and make revenue adjustment based on the difference between annually updated return and the return on debt for year one. As the change in revenue due to annual updating is likely to be small, re-smoothing is not required. Developing a spreadsheet will allow automatic calculation of annual updates. By using the extrapolated Bloomberg FVC in conjunction with CEG's Nelson-Siegel yield curve fitting method, return on debt estimate will be available if Bloomberg ceases to produce FVCs.

**SP AusNet:** Annual updating provides a close match between the actual cost of debt incurred and the regulatory allowance for the cost of debt for the benefit of both businesses and customers. QTC presented evidence on the materiality of the expected mismatch between actual debt and regulatory debt allowance in absence of annual updating. Under a trailing average approach, the cost of debt would have to be estimated for each year of the period in any case, annual updating does not add to the complexity. Concerns about Bloomberg FVCs becoming unavailable mid-period do not prohibit annual updating. True-up does not reduce volatility of cashflows resulting from the mismatch. Annual updating is essential during transition to a trailing average approach as there is a need to incorporate staggered debt issuances during the regulatory period into cost of debt allowance. RDB's natural hedge argument is problematic.

**TransGrid:** Annual updating is necessary to maximise the benefits of the trailing average approach as end of period 'true up' adjustments are likely to result in more significant price shocks for customers. It reduces risk of windfall gains / losses to the service providers.

Set out the risk factors that you consider should be compensated through the rate of return. How can we assess whether different companies are exposed to materially different degrees of these risks?

**ActewAGL:** AER should investigate whether there is a difference in the relevant risk profile between gas and electricity distribution businesses. Broadening the sample to include different types of utilities will introduce the risk of misinterpreting the true risks of different activities.

**APA:** The list of risk factors identified by Frontier Economics is a useful start, these include: demand risk, engineering and design risk, construction risk, operational risk, input price risk, supplier risk, inflation risk, competition risk, asset stranding risk, political risk, default risk, counterparty risk, liquidity risk, refinancing risk, interest rate reset risk.

**APIA:** Frontier report is of limited use as it presents risk factors and their relationship to energy industry and regulation in general, but fails to establish risks facing the benchmark efficient firm. The appropriate approach to identify the risk in the context of NGR 87(3) involve: 1. Identify risks in the context of states of the world and consequences that are faced by the regulated firm. 2. Use 'materiality' filter to eliminate those with very small consequences. 3. Choose a benchmark on the basis of 'similarity'. 4. Choose among relevant models for equity and debt 5. Parameterising the models based on data for the benchmark. AER should include all risk factors that indicated by the relevant financial models for estimating return on equity and return on debt.

**CitiPower, Powercor, SAPN:** If a particular business displays materially different characteristics to the benchmark, then the onus should be on that business to demonstrate this. Gas and electricity network businesses and transmission and distribution businesses are likely to face similar degree of risks

**Envestra:** Unknown risk that cannot be quantified and incorporated into cash flow forecast should be compensated through the rate of return. Gas and electricity networks have different risks as they are derived from different physical characteristics of each form of energy and different consumer demand. Envestra contends the risk it faces is akin to risk faced by firms in the competitive market. Regulatory risk is common to all regulated energy businesses. Higher rate of return is required due to compensate uncertainty created by regulation changes.

**EUAA:** Frontier's analysis and McKenzie and Partington's advice suggest many of the financial and business risk of the service providers have effectively been compensated through cash flows as a result of the regulatory design and hence the WACC should be lower than would otherwise be necessary. It would be helpful for the AER to do pair-wise comparisons of the various aspects of the regulatory regime in the NEM compared to those comparable developed economies where network economic regulation occurs through explicit controls.

**FIG:** Both systematic and non-systematic risks should be considered when determining the benchmark efficient firm. In practice, some risks have both systematic and unsystematic elements and investors may not hold as diversified portfolios as theory predicts. Materiality should be applied consistently across all aspects of revenue decisions rather than specifically to one aspect of setting the rate of return. FIG considers an increase in the WACC of 7-13 basis points is material.

**MEU:** The AER list covers the risks that a service provider is likely to face. However, the AER needs to assess the relative risks faced by an service provider compared to a firm in the competitive environment. Equity beta is a good starting point.

**PIAC:** Consumers too are exposed to risk. Service providers generally have better ability to manage risk than consumers. Consumers have been paying premiums in their energy prices for risks which do not exist or can be easily mitigated by the service providers in the past few years. The risks facing service providers must be considered in the context of other factors in the regulatory regime, including the relative risk of the regulated network industry, lower price elasticity, maturity of energy market, specific features of the service providers' regulatory regime, availability and relative cost to the service provider of risk management tools, absence of competition, sharing of risk between service providers and consumers.

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| Do different return on equity models account for systematic risk differently, or do they also account for non-systematic risk? If the latter, is it appropriate for the AER to set allowances that remunerate risks that could be diversified away from? | **ActewAGL:** There may be multiple dimensions to systematic risk, not simply 'beta-correlation' as accounted by in the SL-CAPM. UK regulators recognise this and have included a small company premium for certain utilities. Supports the use of alternative cost of equity models that account for other risk factors. |
| | **APIA:** Different return on equity models account for systematic risk differently and some also account for non-systematic risks. All relevant material risks should be accounted for, either through the relevant financial models or through explicit allowance in the total revenue calculation. |
| | **ENA:** AER should adopt an approach that considers all relevant estimation methods, financial models, market data and other evidence and give appropriate weight to each piece of evidence based on all available information, in a transparent, predictable and replicable way. |
| | **Envestra:** Supports ENA submission. |
| | **MEU:** Any model has to be tested to see if historic inputs would have replicated actual outcomes and need to show reasonableness compared to the average market outcomes. Dividend growth model example used at the forum would not meet the reasonableness criterion as it implies an equity beta greater than 1. Empirical assessment is more useful than theoretical analysis. |
| | **PIAC:** It is not appropriate to introduce any additional sources of estimation / remuneration for the service providers such non-systematic risks on the performance of individual service providers are compensated for. Commentary in the AFR suggests there is an inverse relationship between the returns to the regulated utilities and the general market returns in difficult economics periods. In this sense, it is suggested that the AER might consider using a range of beta values – low beta in GFC conditions and high 0.8 beta in more normal economic periods. |
| Do you agree that the AER should seek to utilise the smallest number of benchmarks that capture materially different | **APIA:** There is a fundamental tension between how 'similarity' is defined and the number of benchmarks. With perfect data, one can have many benchmarks. However due to limited data availability, a single benchmark can be used. This is also the pragmatic compromise made by |

degrees of risk? How do we utilise different benchmarks while retaining the objectives of incentive-based regulation?

North American regulators.

**CitiPower, Powercor, SAPN:** The guidelines should establish a single definition of a benchmark firm covering all energy networks.

**Envestra:** Gas is a fuel of choice whereas electricity is a necessity, therefore gas sector faces greater risk than electricity sector. 'One size fits all' approach is not appropriate across the entire energy sector. Consideration must be given to an appropriate range of benchmarks that capture materially different degrees of risk. It is not appropriate to simply focus on a 'small' number.

**FIG:** AER should use as many number of benchmark efficient entities as is required to satisfy its obligations under the rules and such an approach would not detract from the objectives of incentive-based regulation.

**MEU:** Firms operate differently, therefore AER cannot determine what is the most financially efficient entity. AER must make reference to the financing approaches used by the firm being assessed. The AER approach does not contemplate any efficiency sharing from the service provider being more financially efficient, so it is worthless to consider different benchmarks given the service providers are the only beneficiaries.

**PIAC:** Strongly support AER's proposal to use the smallest number of benchmarks that capture materially different degrees of risk. It makes no sense both in theory and in practice of benchmarking if every firm is its own benchmark. AER's approach should be consistent – if the rate of return is calculated on the basis of a pure play stand-alone entity, then this should also involve benchmarking each firm against efficient performance that is distinct from the individual circumstances. The AER should only use separate benchmarks when there are material difference in risk and it is essential that this material difference can be demonstrated empirically.

**QTC:** Use of multiple benchmarks will still be consistent with the objectives of incentive-based regulation given the allowances are set using benchmark parameters rather than actual costs.

Other benchmark related comments

**APA:** AER could choose to use as the benchmark the set of businesses which approximate the notional pure play regulated network business operating within Australia without parental ownership and currently providing the same scale and scope of regulated services.

**APIA:** APIA is confused by the requirement that the benchmark efficient entity should be a business that operates with parental ownership at AER's benchmark workshop. The AER has not provided any evidence to suggest that firms that operate with parental ownership are more efficient than those which operate without it.

**CitiPower, Powercor, SAPN:** They continue to be of the view that the conceptual benchmark entity should be a 'pure-play' regulated electricity or gas network business operating within Australia without parental ownership providing the same scale and scope of standard control services to the same customer base in the same regulatory period as in their submission to the Issues Paper.

**EUAA:** A benchmark should assume parent company ownership as it will better account for debt and equity raising cost and the ability to manage and diversify financial risks for most privately owned service providers. EUAA maintains the position that public and private ownership needs to be accounted for. However, it notes the AER lacks the mandate to do so and is not pressing this issue in this guideline. It disagrees with the Frontier report conclusion for this matter as it failed to recognise three factors (sovereign risk, income taxes and debt costs) when citing Brealey.

**MEU:** A revealed cost approach will serve consumers better than the benchmarking approach that the AER is attempting to do. In practice, except for government owned networks, there is no pure play network operation in the country. Risk has to be assessed on the realities of the network services market and not on a flawed assumption that networks are privately owned pure play. There are no small networks as they are part of a parental fleet of assets, large

parent can mitigate the risks inherent in small pure play networks. Frontier's report fails to identify many of the risks faced can be managed or have considerable upside risk. It also fails to put the risks identified into context.

**PIAC:** The ideal of a 'stand-alone firm' is clearly an abstraction from the 'specific circumstances' of each of the firms in businesses' proposals as none of the service providers fit the 'stand-alone' criteria. All private service providers are linked through complex ownership structures to a larger entity, while public service providers have the support of state treasury departments to raise finance, therefore the ownership structures allow lower costs of finance than would be the case of truly stand-alone firms.

**SP AusNet:** Parent ownership should not be included in the definition of a benchmark firm as it does not change the total risk associated with the regulated assets. The rate of return objective requires the benchmark entity to be a stand-alone, pure play entity. Very few private firms receive credit rating uplift due to parental ownership. SP AusNet received a credit rating downgrade from S&P following the sell down of 19.9 per cent by Singapore Power to State Grid. Setting benchmark with regard to ownership may incentivise inefficient corporate structure and penalise businesses that do not receive benefit from parental ownership. In addition, imputation credit impact should be considered if parental ownership is included in the benchmark definition as parent owners generally domiciled outside Australia and have limited ability to use imputation credits.

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| Which of the four broad approaches to combining information to determine a return on equity is preferred and why?<br><br>Are there additional broad approaches that we should consider? | **ENA:** The multi-model approach is the only workable approach and it will provide more stability and better estimates. Strongly against a single model approach and a fixed-weight approach. Believes a primary model with reasonableness checks would be practically difficult to implement. Suggests SL CAPM, Black CAPM, Fama–French model and DGM model should be considered in the multi-model approach due to their differing individual merits/biases/levels of precision. Other information should inform the parameters in and relative weights of models, including financial market data, observed market practices, and market professionals' forecasts. The required return on the average firm should be constant across the models.<br><br>**APIA:** Supports approach 4, a comprehensive approach to consider multiple models. Approach 1 is inappropriate under rule 87 and is inconsistent with the AEMC's intentions when it amended the rule. There is no obvious primary model for approach 2 because all have flaws, reasonableness checks are open to question and would either support or invalidate the use of a primary model. Approach 3 would reduce reliance on a single model, retain simplicity and transparency and avoid the impression of false accuracy created by a complex weighting scheme. However, a more considered use of multiple models and other information – as proposed in Approach (4) – is required when applying rule 87. This is because approach 3 lacks the flexibility to deliver estimates consistent with prevailing market conditions all of the time.<br><br>**Envestra:** Only approach 4 is consistent with the NGR and intention of the AEMC (the multi-model approach). This allows for the broadest range of financial models, estimation methods and market data, and provides the necessary flexibility to adjust the rate of return given changes in market conditions. Further, some of the reasonableness checks undertaken by the AER to date have been unreasonable or ineffective. For instance, RAB multiples are an ineffective way to make judgements of the rate of return.<br><br>**ActewAGL:** Supports the multi-model approach (approach 4) as this is likely to be more accurate, consistent with the rate of return objective and stable over time.<br><br>**TransGrid:** Supports the ENA's multi model approach, including the use of relevant non-model evidence such as independent expert reports. This is preferable to the AER's version of approach 4 as it includes a step by step process for addressing potential differences between the estimates generated by individual models. The first and third approaches do not appear to comply with the Rules requirement to take all relevant evidence into account. The second approach may be workable if the AER can clarify how it would take all relevant evidence into account. Further, the AER should make its assessment principally by referring to evidence regarding the expected market return on equity as opposed to assessing the risk free rate and MRP parameters under CAPM models separately and on different bases. This would increase |

consistency with the return on debt assessment and reduce volatility.

**FIG:** All approaches, accept for 1, are acceptable. An approach that considers multiple models, if applied appropriately, is likely to produce a more informed estimate despite the limitations that exist in the individual models. The FIG supports multiple models, but is against using fixed weightings as this would undermine the flexibility required to produce better decisions. Reasonableness checks should be used and can be a powerful tool when applied appropriately to test if number s produces from theoretical models are consistent with observed market outcomes. However, the FIG has some concerns about the usefulness of reasonableness checks previously applied by the AER: Far too much weight has been given to RAB multiples, there is limited value in comparing with other regulatory decisions as it is inherently circular and there is a stronger case to consider cost of capital estimates from independent expert reports as opposed to broker reports.

**RARE:** Prefers option 4, and notes that, in the spirit of AEMC rule changes, it demands a comprehensive approach from the AER. Doesn't like option 1 because it is overly simplistic and could result in volatile outputs. Option 2 is preferable to 1 and option 3 is transparent in terms of weightings but would be demanding to justify. Supports a rile for reasonableness checks – not just for the overall rate of return, but also for cost of debt and equity, gearing and other input parameters, However, when considering reasonableness checks, the data should be analysed and presented in comparable form. Simply calculated measures provide a low-quality interpretation of valuation measures. Further, forward-looking multiples are preferable.

**PIAC:** Favours option 2 as it provides the better outcome within the framework set out in the Rules. It also combines consistency, transparency with some flexibility. Option 1 fails to provide sufficient flexibility. But locking in weights for various outputs, option 3 limits the AER's discretion to respond to changing conditions. Option 4 leaves considerable discretion to the AER and service provider, but little transparency about the final choice. PIAC suggests what the Guideline should set out under option 2 on page 23 of its submission.

**CitiPower, Powercor and SAPN:** Support the multi-model approach, which will provide for more stable and reasonable return on equity outcomes. The primary model with cross-checks approach is unlikely to satisfy the Rules, because this would ultimately be a single-model approach if the cross-checks don't affect the estimate. The businesses are also concerned about this elevating a particular model as being 'preferred'. For any reasonableness check to be considered relevant, it must have some prospect of having some effect on the allowed rate of return, and the way in which it will be taken into account must be made transparent. Does not support trading or transaction models being used on their own to draw inferences about the rate of return.

**MEU:** Prefers option 2 as it balances simplicity and consistency with the ability to modify to reflect wider market conditions. MEU also considers that there is merit in examining longer term trends for equity returns which reflect the aspirations of long-term investors rather than reflecting the short term-ism applied by traders in equities.

**APA:** Favours approach 4. The NER and NGR require the use of a multiple model methodology. Regard must be had to relevant estimation methods, financial models, market data and other evidence. Approaches 1 and 2 are inconsistent with the Rules and AEMC's intentions. The simplicity and transparency of approach 3 would largely be illusory. Implementing approach 4 through the use of a primary model, with results from other financial models used informatively to assess the result from the primary model, would not be consistent with the Rules. APA would be concerned about the use of reasonableness checks. Before these could be used, the AER should demonstrate that the check was capable of yielding results consistent with the rate of return objective.

**EUAA:** The AER should have regard to evidence from a wide range of sources when assessing the reasonableness of its WACC decision. The AER should commit serious effort to developing reasonableness checks based on valuations and other market information, but also on approaches adopted by other regulators and the evidence of actual performance. The AER should have regard to returns in other industries, service provider rates of return historically. Data that would be particularly useful includes comparing performance against targets (possibly including evidence on expenditure, taxes, debt costs and profits), comparing the rate

of return allowed in Australia to that allowed internationally, and pair-wise comparisons of Australian regulatory design to that elsewhere.

**COSBOA:** Favours approach 2 if stakeholders are unable to explain how various information sources can be bought together transparently. It would be preferable to use this approach rather than rely on inappropriate or uncertain weights in the application of multiple models. COBOA also sees the advantages in approach 3 if it were combined with reasonableness checks. Supports the use of cross-checks and reasonableness checks to help determine any need to re-examine the overall rate of return, return on equity, return on debt and gearing ratio. However, COSBOA has concerns about using RAB multiples and trading multiples as these can be in excess of unity. COSBOA is also concerned about using previous regulatory decisions because this could result in circularity as opposed to accuracy. COSBOA also see little point in apply a financeability test.

| How can the various information sources relevant to estimating the return on equity be brought together transparently? | **ENA:** Transparency requires the AER to clearly:<br><br>▪ Set out all evidence that it considers to be relevant;<br><br>▪ Explain the reasons for rejecting any piece of evidence as being irrelevant;<br><br>▪ Explain how it has arrived at each parameter point estimate; and<br><br>▪ Explain the weights that it has assigned to each financial model and the reasons for assigning those weights.<br><br>**APIA:** Transparency will be achieved by the AER clearly articulating its considerations when determining an allowed rate of return that meets the rate of return objective. The AER's Guideline and Access Arrangement Decisions should outline its process of judgement.<br><br>**Envestra:** Transparency requires the AER to: set out all evidence considered and the basis for rejecting evidence, explain how it arrived at each parameter point estimate within a defined range and define weights assigned to each model together with an explanation for assigning such weights.<br><br>**PIAC:** This is more of an issue under options 3-4, as opposed to under option 2.<br><br>**MEU:** Models have a place in evaluating the appropriate return on equity. However, empirical data is more reflective of what is actually occurring in markets and therefore a more appropriate source of information for setting an appropriate rate of return. Recommends looking at the investment practices of large capital intensive firms when assessing investments. Currently there is too much credence given to the commentary by network firms and decisions are made in isolation of what capital intensive firms in competition do in regard to their investments. More attention must be given to the actual outcomes network firms achieve in terms of return on equity. Comparisons of these returns needs to be made with outcomes seen in the wider markets (after making allowance for the differences in risk) so that adjustments can be made to the processes for setting future allowances for returns on equity. |
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| Do stakeholders agree with our preliminary position that it is not feasible to change the weights placed on different return on equity models (over time) based on differing market conditions, industry segments or firms? | **ENA:** Pre-setting weights would lead to inflexibility that would conflict with the need to accommodate for changes in market conditions. For instance, the AER would have to regard information in advance, causing problems if pieces of evidence were unavailable when it set the weights. It would also be extremely difficult to pre-define all of the possible market conditions which could affect the weightings.<br><br>**APIA:** Disagrees with the AER's preliminary position. It is feasible and important to change the weights placed on different return on equity models over time based on differing market conditions. Different models are better predictors of the required equity returns under different market conditions.<br><br>**Envestra:** Any approach that seeks to pre-specify weights in advance of a defined assessment date is impractical, inflexible and inconsistent with the new NGR's intention. |

**FIG:** States that fixed weightings undermine the AER's flexibility and discretion in producing better decisions.

**PIAC:** This is of less relevance under option 2. PIAC agrees that if options 3 or 4 were chosen, it would be infeasible to change the weightings of different models with different market conditions, industry segments or firms. This complexity would not be warranted, given that all the models and data sets will have a number of weaknesses.

**MEU:** Agrees. Setting weights can only be arbitrary and based on unknown qualitative measures, even when changing them according to market conditions. The MEU is concerned that changing weights due to changed market circumstances will introduce another basis for service providers seeking change to increase the return on equity, regardless of whether such is justifiable in reality.

**APA**: Inferred disagreement. APA states that fixed weights disregard the Rule requirements to take prevailing market conditions for equity funds when estimating the return on equity.

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| What are the benefits of using financial models to estimate the return on equity for an average firm before estimating it for the benchmark firm? | **ENA:** Proposes that the required return on equity for the average firm should be computed before computing the return on equity for the benchmark firm. The SL CAPM, Black CAPM and Fama–French model all begin with the same required return on equity for the average firm. All these models should use the same value for the required return of the average firm. All versions of the DGM can also produce an estimate of the required return on the market. Therefore, this step requires no extra work – but it does increase transparency and ensures that the models are internally consistent. Further, some relevant evidence pertains only to the average firm rather than the benchmark firm, like many independent expert reports. |
| | **APIA:** Supports the ENA's proposal because it will provide: points of comparison about how each model performs in estimating the cost of equity for the market and will benchmarks to compare returns estimated for regulated businesses. It also provides a useful starting point in determining the rate of return relating to the service provider's risks in providing reference services. |
| | **Envestra:** Estimating the return on equity for the average firm will help the AER calibrate its estimate before determining the return on equity for the benchmark firm. This will remedy the material errors that were evident from previous AER decisions and its application of the CAMP under the old NGR. |
| | **PIAC:** Agrees with the AER – there would have to be substantial benefits (such as increased accuracy or significant insights) of adding an additional complex step of estimating a return on equity for an average firm before estimating it for the benchmark firm. Further, it is unclear what is meant by the 'average firm' or how it is relevant to the rate of return objective. |
| | **MEU:** The risk of looking at the return on equity independently of the gearing of the entity discounts the value of more efficient financing that an entity might be able to achieve. For example, a lower cost of debt should be achieved with a lower gearing, but lower gearing tends to reduce the rate of return on the larger amount of equity lower gearing causes. The fact that service providers have a more certain cash flow allows lenders to provide more debt than they would to a similar entity but without the highly certain cash flow. This means that the certainty of cash flow reduces the amount of equity required compared to the similar entity without the certainty of cash flow. This, therefore, inflates the return on equity as the same amount of profit would be allocated over a lesser amount of equity, inflating the return on equity compared to a similar entity without the cash flow certainty. |
| | **COSBOA:** Sees no benefit in determining the return on equity for the average firm. |
| Do you support our proposal of having a single approach for estimating the return on debt should be used for the definition of the benchmark efficient entity (or for each definition, if more | **ActewAGL:** Supports the trailing average portfolio approach. However, the guideline should outline all three approaches. |
| | **APA:** No single approach to measure the cost of debt will be appropriate to all businesses. Businesses should be able to nominate the method that best suit their circumstances. It notes AER and ERA are leaning in opposite directions on the best cost of debt methodology. |

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| than one benchmark is used)? | Different approaches across jurisdictions could distort investment signals.

**APIA:** If the regulator intends to apply a single cost of debt across the whole industry, it should prove that this is a valid response to differentiation caused by inefficiency. Otherwise, the regulator needs to apply different costs of debt.

**ENA:** The guideline should set out all three methodologies stated in the Rules. AER should reject business' proposal if that business proposes a different benchmark purely because it was expected to deliver higher revenues.

**EUAA:** Definitely does not support the menu approach as the potential for gaming with such an arrangement is obvious and there is no off-setting benefit.

**FIG:** There could be more than one efficient financing approach and the AER should keep to options open.

**Jemena:** AER needs to recognise the rules and the AEMC allow three benchmark approaches when estimating the return on debt. Even if the AER prefers only one benchmark, the guidelines should set out how it would apply each of the three at a given price determination by giving enough detail so that stakeholders can estimate the return on debt using any of the benchmarks. The guidelines should also leave the option open for the service providers to switch between benchmarks under some circumstances. Service providers do not only face incentives to select the benchmark that results in the highest allowed revenue, they also seek stable cash flows. It would be harder for service providers to raise the funds if they regularly switch between benchmarks, unless the extra risk is more than offset by the windfall gain.

**MEU:** The rules do not allow only those three approaches, a revealed cost approach should be considered. AER should incentivise the service providers to minimise debt cost impact and to find more efficient ways of providing debt. Development of benchmark gearing should reflect the actual gearing used by regulated businesses.

**PIAC:** Supports the adoption of a single portfolio based approach. The main concern is the opportunity for gaming across regulatory periods, such that there is a constant bias towards higher estimates of the cost of debt. A menu approach would undermine attempts reach a balance between the interests of consumers and service providers by enabling an service provider to select the methodology in each determination that would achieve the highest debt allowance. Separate benchmark entities should only be established following a clearly demonstrated difference between the approaches to debt that reflect substantive underlying drivers and manifestly different risks. AER should avoid attempts to create a spurious level of accuracy by establishing multiple benchmarks reflecting individual firm characteristics.

**QTC:** Supports the use of a common return on debt approach for each definition of the benchmark entity provided this does not require the same return on debt to apply to all service providers that match a particular benchmark definition. For example, service providers should be able to nominate their specific averaging periods to calculate the base interest rate component of the return on debt, apply a weighted trailing average that will produce a different return on debt for each service provider.

**RARE:** The option should be in the hands of the service provider, so the debt cost mechanism is compatible with their current debt portfolio. Noting the ability of small network to completely refinance during the measurement window but the inability for the largest networks to do this.

**SP AusNet:** Prefers a single benchmark approach for estimating the cost of debt. |
| How do the 'on the day' approach, trailing average portfolio approach, and hybrid approach to estimating the return on debt compare in terms of promoting efficiency? | **ActewAGL:** The portfolio approach is appropriate for smaller businesses as they still seek to mitigate refinancing risk. However, they may not be able to issue debt at the same terms as larger businesses as the debt issuances would need to either be substantially smaller or issued less frequently.

**APA:** The question of the relative efficiency of different approaches arises only in the context of ensuring when any of these approaches is used, it should meet the efficient financing costs |

of the benchmark efficient entity.

**APIA:** Similar to its answer to the previous question, unless AER can show the different approaches are due to inefficiencies, AER should not limit its considerations to a single approach.

**CitiPower, Powercor, SAPN:** Trailing average portfolio approach or the hybrid approach would best reflect efficient financing practice of a service provider.

**ENA:** Trailing average approach benefit consumers by reduce price volatility. For most businesses, it best reflects their long term efficient financing practice, contingent on annual updating. However, it is problematic for smaller businesses. Those businesses should have the opportunity to argue for an alternative approach.

**Envestra:** Supports the trailing average portfolio approach with automatic annual adjustment based on the cost of debt measured over a historical 10 year period. As it closely resemble the efficient financing practices of gas distribution network businesses.

**Jemena:** 'On the day' approach is difficult to hedge in practice, trailing average approach is difficult to hedge for small service providers and hybrid approach is difficult to hedge to large service providers. Jemena prefers the hybrid approach as it matches its current debt practice and also benefits consumers. It cannot implement the trailing average approach effectively due to its size. Based on QCA analysis, a reasonable swap transaction cost for use in the hybrid approach should be 8-10 basis points. According to Jemena's own analysis, the hybrid approach provides lower cost of debt than the other two approaches both currently and in the long term. Hybrid approach is less volatile than the 'on the day' approach unless unrealistic assumptions are made. QCA and NZCC have adopted similar approaches to the hybrid approach. All service providers should have the opportunity to propose a cost of debt approach that is efficient for a network with their characteristics.

**MEU:** AER should incentivise the service providers to minimise debt cost impact and to find more efficient ways of providing debt. A trailing average approach does nothing to incentivise the service provider to seek more efficient ways to provide debt. Further under such an approach, if a service provider found a more efficient way to provide debt, it is allowed to retain the benefit instead of transfer to the consumers. A revealed cost approach (similar to the current opex approach) accompanied by a sharing scheme is the best approach that will incentivise service providers to find the most efficient approach and transfer the benefits to consumers. A trailing average approach more closely reflects what occurs in the wider market. A hybrid approach should not be used as it attempts to deconstruct and then reconstruct the costs, which does not improve accuracy of the calculation.

**NSW DNSP:** Support the trailing average approach with annual updates. A trailing average approach is the most efficient debt management practice for infrastructure businesses with large debt portfolios and assets with long economic lives. It significantly reduces refinancing risks and smooths the impact of volatile cost of debt changes. Network businesses can actually implement this approach in practice. On the other hand, businesses cannot implement 'on the day' approach as the debt markets are not liquid enough to raise that amount of debt in a short period or yield would be significantly higher. Under 'on the day' approach, the entirety of a regulated business's allowed cost of debt is exposed to short term cost of debt variations.

**PIAC:** The consumers were on the 'wrong side' of the last round of determinations in most states when 'on the day' approach was used, adopting a trailing average or hybrid approach will mean that consumers also forgo the compensating benefit of the lower than average interest rates in the next round of determinations. The long term interest of consumers lie in adopting a more stable and predictable trailing average / portfolio approach. Hybrid approach artificially and unnecessarily separates the way in which the risk free and the risk premium components of the cost of debt are calculated. It also adds complexity and reduces transparency of the process.

**QTC:** Trailing average portfolio approach based on 10 year fixed rate corporate debt is the most appropriate approach for determining the return on debt for the benchmark firm. It offers long term benefits to consumers through lower price volatility and allows service providers a

reasonable opportunity to recover efficient debt financing costs. The trailing average approach needs to include following features to ensure efficiency: annual updating of the return on debt, weighting of new borrowings and a benchmark debt tenor that is consistent with the average tenor of debt. 'On the day' approach is inefficient because it exposes a stand-alone service provider to an unacceptably high level of refinancing risk and would not be possible for the majorities to implement in practice. The hybrid approach may be efficient for some service providers, but it may expose consumers to a higher level of interest rate risk compared to the trailing average approach.

**SP AusNet:** Currently manages its debt portfolio through hybrid approach and believes this is an efficient financing practice. If trailing average portfolio approach is adopted, then annual update would be essential, particularly during transition.

**TransGrid:** AER should apply a long term trailing average approach for those large service providers that already apply a portfolio debt approach. TransGrid is such a business. It is an efficient debt management practice used by large unregulated infrastructure businesses and reduces volatility for both network business investors and customers. Large service providers may find it problematic to continue to refinance their portfolio under the spot or hybrid approaches.

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| What are the considerations that we should have when setting the gearing level?<br><br>Do you support our proposed methodology for determining the gearing level? | **APIA:** Happy for the AER to set a particular gearing level based on its assessment of how the Modigliani & Miller (1958) assumptions hold true in the real world. It notes the CAPM and Modigliani & Miller (1958) share several common assumptions, if the AER relaxes an assumption when setting the gearing, it should also do so for the CAPM.<br><br>**ENA:** It is concerned that the AER has not set out details of its assessment associated with any benchmark gearing data nor addressed the consistency issue with parameter estimates used in the relevant cost of equity models in the consultation paper. 60 per cent gearing assumption is consistent with the range of gearing analysed by SFG on the 5 currently listed Australian regulated service providers plus HDF.<br><br>**Envestra:** AER needs to consider empirical evidence including the costs and risks associated with higher gearing, interrelationship between the return on equity and credit rating and credit rating agencies' expectations for benchmark efficient entity's gearing. Supports ENA position on gearing.<br><br>**FIG:** Appropriate gearing level must be defined by reference to the gearing level of the benchmark efficient entity. AER should observe how businesses in practice make capital structure decisions, including the cost of raising debt (maybe dependent on the business' credit rating) and the level, stability and timing of its cash flows.<br><br>**MEU:** Does not think that the AER can identify the level of gearing better for an efficient service provider than the directors or lenders of the firm. Gearing should reflect regulated monopolies and not include firms which are operating in a competitive environment.<br><br>**PIAC:** Gearing level should be consistent with a benchmark credit rating of BBB+ and with sufficient cash flows being available to the business to continue to invest. The benchmark gearing ratio of 60 per cent is conservative in the sense that it increases the probability that the allowed cost of capital is greater than the actual cost of capital particularly when the entity has parent guarantees. |
| Should we still estimate gamma as an economy wide measure? Alternatively, should we seek to narrow the gamma benchmark? If so, what is a more appropriate benchmark? | **ENA:** Gamma should be the distribution ratio (0.7) multiplied by theta (0.35), i.e. 0.25. Theta should be estimated as a market value using dividend drop-off analysis. Redemption rates cannot be used for any purpose other than an upper bound for theta. The distribution rate should be estimated from empirical taxation data, it should not be estimated on the basis of speculative assumptions. The AER should either continue its regulatory precedent of estimating gamma as a market-wide parameter or examine the actual payout ratio and the actual shareholder base of the relevant firms as a key aspect of its measurement of theta. The AER should consider market practitioner estimates of the (ex-imputation credits) required return on equity and explain, where relevant, why this differs from their own estimate. |

**APIA:** All relevant evidence for estimating gamma should be considered and must be properly evaluated as to its validity. The most rigorous estimates of theta are derived from dividend drop-off tests as recognised by the Tribunal, but if new research delivers alternative robust estimates, these should be taken into account. The market value, as opposed to the face value, of imputation credits should measure the utilisation rate. The marginal investor, as opposed to the average investor, should be considered when establishing the value of imputation credits. While all relevant evidence should be considered, APIA supports the use of, $f = 0.7$ and $\theta = 0.35$. It is appropriate to consider any differences of investors in industry segments, but before an industry-specific gamma could be applied, appropriate statistics should demonstrate that the industry-specific estimate was different to the market estimate.

**Envestra:** The practices of independent experts are an excellent source of information that the AER can apply. A value of zero is the best estimate of gamma, and is widely applied.

**PIAC:** Calculating gamma is a very inexact science. The AER can't look overseas for guidance because they have different taxation rules. The Tribunal's rejection of the AER's proposed gamma of 0.65 should not be interpreted as enduring a gamma of 0.25. Annual reports of private, listed service providers indicate using a gamma of 0.65. One should note that dividend imputation credits are only available to Australian shareholders, while there is a high level of overseas equity investment in Australian energy utilities.

**MEU:** Gamma should be estimated on the basis that there should be no double taxation on Australian shareholders and that all shareholders will use the benefit to the maximum. Overseas shareholders have already made the decision to invest knowing they are not entitled to the benefit of imputation. The AER should not increase the allowed revenue to reflect that a firm might not provide fully franked dividends or that a shareholder might not use the benefit provided by imputation.

**CitiPower, Powercor and SAPN:** The Businesses are not aware of any evidence that would support a value other than 0.25 for gamma, and would therefore support the guideline adopting this value.

**COSBOA:** Thinks that a choice of narrower benchmark based on utilities or energy networks would find that these pay higher dividends and franking credits relative to the rest of the economy, with a higher payout ratio. Notes that the choice of a narrower benchmark may require adopting it for the utilisation rate as well, which is more difficult to estimate. We believe it is also be useful to consider consistency with the NEO, NGO and RRP and the Rate of Return criteria in considering all questions about the estimation of gamma.

| To what extent do stakeholders support the use of a definitive source of evidence, even where it has demonstrable shortcomings?

Alternatively, to what extent do stakeholders support the use of a wider range of evidence, having regard to its strengths and weaknesses? | **ENA:** Advocates an approach that considers all relevant estimation methods, financial models, market data and other evidence, and which gives appropriate weight to each piece of evidence based on all available information, in a transparent, predictable and replicable way. Evidence about the general reliability of models, cotemporaneous empirical evidence and evidence drawn from outside the models should be used to inform the weights given to different models. Reasonableness checks or other evidence should only be considered relevant if they can affect the allowed return. Trading and transaction multiples are not relevant evidence. It may be possible to use broker discount rate estimates, although subject to many limitations. Redemption rates can only be used as an upper bound of theta. Financeability and credit metrics should not be used as an ex-post reasonableness check. MRP survey information should generally be tested against criteria set out by the Tribunal. Independent expert valuation reports contain relevant evidence.

**APIA:** For all aspects of the rate of return, including gamma, evidence must be properly evaluated, as to its statistical, theoretical and empirical validity and its strengths, weaknesses and biases.

**Envestra:** The use of a definitive source of evidence with demonstrable shortcomings should not be used if such shortcomings result in materially distorted outcomes. Recommends the use of a range of appropriate evidence, having regard to specific strengths and weaknesses with a view to all evidence being considered in informing a final assessment. |

**ActewAGL:** While it appreciates there are statistical problems when estimating cost of capital parameters; broadening the sample of relevant firms to include water and wastewater utilities introduces the risk of misinterpreting the true risks of different business activities.

**TransGrid:** In having regard to all evidence, it is also important that the guideline looks towards the market and market practitioners wherever possible. The market provides the starting point for the relevant benchmark/s and that evidence must be afforded appropriate weight.

**COSBOA:** Recommends considering a range of sources for estimating gamma. This should have regard to the strengths and weaknesses of each source. A position would be needed on how to use the different sources and how to assign weightings. Favours the AER considering this matter further.

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| Do you support our preliminary position of not setting a specific allowance for debt and equity raising costs, and instead, remunerating them elsewhere in the revenue building blocks? | **ENA:** The ENA agrees there are a number of possible 'homes' for equity and debt raising costs within the building block model. However, it is important that this issue is not over-looked by falling between the separate WACC and opex/capex discussions and that there is consistency with other parts of the regulatory decision. Therefore, the AER should establish how these costs should be accounted so that consistent assumptions are made about corporate structure, retained earnings, new capital raising costs, debt raising, and etcetera.

**APIA:** The AER must include an allowance for these costs. APIA is not particularly concerned whether they are recognised in the rate of return or as elements of opex/capex. The cost of equity raising must be properly calculated reflecting the amortisation of raising initial capital plus the cost any new equity raising.

**Envestra:** Does not support the AER's preliminary position. Debt and equity raising costs can be material and need to be objectively and transparently determined and incorporated into the building blocks.

**TransGrid:** Supports continuing to set discrete allowances for debt and equity raising costs, as operating expenditure and capital expenditure items respectively.

**NSW DNSP:** Supports the AER continuing its current practice of recognising equity raising costs as capex and debt raising costs as opex within the building blocks framework. Disagree with the AER's preliminary position that considerable resources are required to estimate debt and equity raising costs.

**FIG:** Supports the continued allowance of debt and equity raising costs within the revenue requirement formula. If these are to be remunerated within the rate of return, there must be an explicit allowance for them.

**PIAC:** Supports the approach of accounting for the debt and equity raising costs elsewhere in the revenue building blocks, in particular, as a component of operating costs.

**MEU:** No. By rolling the cost of debt and equity raising into another element of the building block, the allowance will become non-transparent and be a source of future contention. This may expose consumers to 'double dipping'. If these costs are insignificant, they should not be included at all. If these cost must be accommodated for, then then the revealed costs incurred by the service provider provide a simple and effective method for providing an allowance.

**CitiPower, Powercor and SAPN:** Strongly disagree. The AER should provide a specific allowance for debt and equity raising costs. The businesses would be open to consultation on a simplified methodology for calculating these allowances.

**COSBOA:** Agrees with the AER to no longer include debt and equity raising costs in the building block revenue allowance, but seek to included them in the rate or return or allowed expenditure. Does not support submissions that seek to add liquidity and risk management costs into the allowance. |

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| Should we continue to use our current approach to forecast inflation or move back to using the Fisher equation? Alternatively, should the AER use inflation swaps? Are there other approaches not identified in this paper that we should consider? | **ENA:** Is seeking expert advice on this issue. However, its preliminary position is that the AER's current approach has generally worked well and it should continue to rely on its current approach. However, in extreme market conditions, such as those prevailing in late 2008/9, it should have regard to the break-even inflation estimates.<br><br>**APIA:** The current method of using RBA forecasts remains the best method available. It must be affirmatively demonstrated that there are no distortions in the yields on CGS before the Fisher method can be applied.<br><br>**Envestra:** The AER current approach has not produced inflation forecasts with any systematic biases and should therefore continue to be used.<br><br>**ActewAGL:** Supports the AER's current method for forecasting inflation, which is more stable and predictable over time than that delivered by the Fisher equation.<br><br>**NSW DNSP:** Support the AER's current approach. However, recognise that it may be possible to estimate inflation using the Fisher equation now that the market for indexed bonds has become liquid. The NSW service providers support the AER checking its forecast of inflation using RBA forecasts with the forecast inflation estimated using the Fisher equation.<br><br>**FIG:** The best approach is one which minimises forecasting errors and is least costly to implement.<br><br>**MEU:** Supports the current approach of using RBA forecasts.<br><br>**COSBOA**: Supports the current AER approach, subject to further consideration. |
| Other significant issues raised | **APIA:** The criteria are sound, except promoting simple over complex approaches where appropriate has potential for misapplication. It is important to specify what 'where appropriate' means – this should only be where there is no material benefit to be gained from more complex approaches. Stability in equity returns can be achieved if the inverse relationship between the MRP and the risk free rate is recognised. Two approaches to achieve this and also reflect prevailing financial market conditions as required by Rule 87. One approach is to apply the short term forward looking estimates of the MRP and the risk free rate. Another approach is to apply the longer term more backward looking estimates.<br><br>**TransGrid:** Willing to consider additional principles or criteria relevant to the AER's exercise of discretion. However, shares ENA's concerns that the principles proposed in the Consultation Paper are not supported by the rate of return objective, the NEO, the NGO or the revenue and pricing principles. The rate of return objective should remain primary in assessing the return on capital and additional principles should only be included where the policy intent is clearly demonstrated.<br><br>**CitiPower, Powercor and SAPN:** The AER should not overlay a further set of principles or criteria in its Guideline as this would be given weight at the expense of the requirements in the Rules and NEO/NGO. Criteria could be re-framed as a list of relevant considerations to be taken into account.<br><br>**MEU:** What the new criteria fail to include is an assessment of the outcome of the new regulatory approach so that the outcome is tested against reality – such that the allowed rate of return does not result in an allowance that is inconsistent with what is actually seen in the market.<br><br>**COSBOA:** Does not oppose the use of criteria as opposed to principles or considerations. However, these criteria must clearly relate back to the NEO, NGO and RRPs and be clearly subordinate to the NEL, NGL and associated rules. Whilst we would place some weight on stability in the return on equity, if this came at a cost, then the value of stability would diminish. Some further information from the AER would be welcomed. |
| What should be our | **APIA:** Different firms may adapt different ways, therefore there is no reason to insist on one |

considerations when deciding whether transition between benchmarks is required? How should we apply transition while retaining the properties of incentive-based regulation?

transition approach.

**CitiPower, Powercor, SAPN:** Do not think transition mechanism is required. Do not support transition mechanism proposed by the RDB as it assumes that regulated businesses were refinancing their entire debt every five years at the time of the reset. However, no evidence suggests the regulated businesses finance this way. Encourage further consultation if the AER considers that any form of transition may be required.

**ENA:** The purpose of transitional arrangements is to ensure that businesses are able to meet their regulatory obligations and have the opportunity to recover at least their efficient costs. Any transition arrangements need to be fair and reasonable, include annual updating provisions, AER needs to take into account individual circumstances of the business. 10 year term must be retained in the transition. AER need to consult widely on any proposed transition arrangement and develop them in conjunction with businesses.

**Envestra:** Supports ENA submission. No transition is required for Envestra.

**EUAA:** Based on its consultant's (CME) advice, it is not convinced that a case exists for a transition arrangement.

**FIG:** It may be necessary for the AER to consider the appropriate transitional arrangement if a trailing average or hybrid approach is to be applied, given the magnitude and significance of these changes. Especially in the first round of the regulatory decisions as potential cost under recovery should be managed.

**Jemena:** Supports AER's position that any transition arrangement should satisfy the NPV=0 condition so that both consumers and service providers are not unduly impacted. A well specified transition mechanism can also manage regulatory gaming concern associated with multiple benchmarks. A transition arrangement is not needed if adopting a hybrid approach. However, annual updates are required in the transition mechanism if adopting a trailing average approach.

**MEU:** Does not see the need for a transition from the current 'on the day' approach to the trailing average approach as most service providers already have a debt portfolio in such a way.

**NSW DNSP:** NSW service providers current debt management practices are already consistent with the trailing average approach, therefore no transition is needed. Further, transitional arrangements would create investment distortions for the NSW service providers as they do not refinance their entire debt portfolios at the start of a regulatory period. The transition path in the RDB paper suggests a new approach, which is not consistent with the previous 'on the day' approach' nor the trailing average approach.

**PIAC:** It is essential to recognise the current position unduly rewards service providers for the cost of capital over the past few years. Therefore, it is not unreasonable for the service providers to wear some costs or loss of expected earnings from this transition. PIAC also recognises the question of additional risk is an empirical one and the impact of transition should be carefully studied and 'stress' tested.

**QTC:** QTC has previously outlined a transition approach that the starting rate for the portfolio approach would be based on prevailing 10 year rates. AER should also consider other transitional approaches that achieve similar outcomes.

**SP AusNet:** Transitional arrangements must be sound and provide appropriate compensation for businesses transitioning to the new benchmark while also considering customers. QTC proposed a pragmatic approach to transition in its submission. RDB's proposed transition path does not compensate businesses for the staggered five year fixed rate debt issued throughout the period and is therefore unacceptable.

**TransGrid:** Where a service provider is able to meet the new obligations without assistance, there should be an immediate transition. TransGrid's current debt management practice is already consistent with the portfolio approach, therefore there is no need for transition. Both

transitional methods discussed in AER's consultation paper would result in material under-compensation for TransGrid relative to the efficient benchmark.

| To what extent does the estimation method need to incorporate the different types of debt available to a business in order to be consistent with the Rate of Return Objective? | **APIA:** Capture information about different types of debt financing would be ideal. However, the nature for arbitrage should eliminate the need as it eliminates any material differences between the cost of debt for the various types of finance. Use of bonds as a proxy for all debt types is a reasonable simplification.

**Envestra:** Supports ENA submission. Any decision to broaden the types of debt included in the estimation method would increase the level of judgement and subjectivity of a decision.

**ENA:** Ideally should be defined to include the issuance practices that reflect actual practice. CEG demonstrates 41 per cent of bonds issued by Australian comparable regulated energy businesses are callable and 35 per cent of debt is issued in a foreign currency.

**MEU:** Debt is obtained from a variety of sources. To exclude these from the cost of debt build up is likely to force consumers to pay more than the efficient cost and thus does not satisfy the rate of return objective. A revealed cost approach is more likely to achieve this objective. AER needs to ensure that the cost of debt reflects the bulk of the debt sourced by NSPs rather than rely merely on one source which is probably at the higher end of the cost scale.

**PIAC:** It is better for the AER to focus on effective but simple arrangements with little intrinsic risk to represent benchmark efficient NSP. PIAC would also encourage AER to closely monitor trends in debt financing. There is increasing borrowing from overseas debt sources by the NSPs as they provide significantly lower costs than the regulatory allowance.

**QTC:** There is evidence that service providers and infrastructure businesses issue floating rate notes, debt with embedded options and offshore debt. Therefore adopting a method that allows a broader sample of debt issues may provide a better estimate of efficient debt financing costs for a benchmark service provider. It considers these types of debt issues should be incorporated into the estimation process, provided this is done in a robust and coherent way. |
| Should we develop our own dataset for estimating the return on debt or use a third-party source such as Bloomberg? What would be the key considerations in developing our own dataset and how should they be addressed? | **ActewAGL**: If the AER opt to develop its own dataset, the AER needs to ensure transparency and accountability to continually publish the bond indices. The method to construct the index should not be a simple average like ERA's method, but should adjust for asymmetric sample around the target tenor, nonlinearities in the yield curve and differing coupon rates across different bonds, while avoid arbitrage.

**APIA:** Support the use of Bloomberg as the source should be independent and expert. 'It would be inadvisable for the AER to attempt as a part-time exercise what Bloomberg does 'for a living'. AER is a participant in the regulatory process, therefore it should not develop its own dataset.

**CitiPower, Powercor, SAPN:** Supports the use of Bloomberg BBB air value curve extrapolated to 10 years. ERA and IPART compile their own benchmark bond sample and the ENA submission demonstrates such approaches are inappropriate. Similar RDB identified disadvantages of these approaches. In the case of Bloomberg BBB fair value curve is no longer available, AER needs to consult on and include fall-back methods in the guideline.

**ENA:** Bloomberg BBB fair value curve extrapolated to 10 years remains the best source to estimate benchmark return on debt. Noting its advantages like being an independent third party provider and its expertise. Its disadvantages include it is based solely on Australian dollar bonds and excludes bonds with options. ENA submits the failure to take into account of the callable bond would cause the Bloomberg FVC to underestimate the benchmark return on debt. An alternative would be for the AER to estimate a fair value curve from individual bond yield published by Bloomberg. (CEG has set out such a methodology). Does not support the adoption of sampling approaches that are similar to that of ERA's/IPART's as CEG contends taking a simple (or weighted) average of a subset of the available data will not make the best use of the available information. Both ERA and IPART use bond yield data exclusively from Bloomberg, which excludes fixed and floating rate notes from UBS and other providers. In addition, ERA excludes all foreign currency bonds while IPART excludes credit wrapped |

bonds, bonds with embedded options as well as foreign currency bonds other than those denominated in US dollars.

**Envesta:** Return on debt could be estimated either by reference to a third party data source (Bloomberg) or by fitting curves through a wide range of yield data. It supports the continual use of Bloomberg FVC as PwC found the DRP calculated using the extrapolated Bloomberg BBB fair value curve was a close fit for the econometrically estimated DRP and it is complex others to construct their own yield curves.

**MEU:** The current approach using the BFVC has been demonstrated empirically that it does not result in a representative outcome for the return on debt used by NSP nor the return on corporate bonds issued by NSPs and their parents. Further, BFC are not representative of the credit rating of NSPs and require both extrapolation and interpolation. AER should develop its own dataset that reflects both the wider market and for regulated monopolies.

**PIAC:** AER should persist with the Bloomberg data, particularly if the forecast period for the yield curve is reduced to 5 years as it will have considerable benefits for the AER in terms of the quality of the various data sets. It would be wise for the AER to further investigate the option of setting up its own data set, testing it with the Bloomberg data series.

**QTC:** The yield on the 10 year debt benchmark could be estimated using the extrapolated BFVC and estimates from the Nelson-Siegel yield curve model as developed by the CEG. It allows a broader range of domestic and offshore debt issues to be used to estimate the yield on the debt benchmark and ensures that estimates can still be made if Bloomberg ceased producing FVCs. Using a portfolio approach to calculate the return on debt should alleviate any concerns regarding the perceived quality of the Bloomberg FVC when calculating an average return on debt over a 10 year period. To address the risk that Bloomberg ceases to produce 7 year BBB FVC, it considers the best way is to develop a yield curve-fitting method based on the Nelson-Siegel yield curve model. By giving some weight to the Nelson-Siegel estimates, the yield on the debt benchmark will reflect the yields on debt issues that are not used in the construction of the Bloomberg FVCs. If Bloomberg decides to no longer produce FVCs, the Nelson-Siegel estimates can be used as an automatic replacement. A spreadsheet could be developed to automatically calculate the return on debt and the annual adjustments to the allowed revenues. This calculation could be reviewed during the subsequent regulatory determination.

| When selecting bonds for use in the estimation—either in an AER-developed dataset or a third-party dataset—what should be our selection considerations in terms of maturity, credit rating, industry sector and country of issuance? | **ActewAGL:** Supports a long-term horizon (10 year) for the return on debt, as it is consistent with the long-lived nature of regulated assets and the AER's previous approach. Matching the term to the length of the regulatory period distorts efficient market outcomes and can induce inefficient financing costs and risks.<br><br>**APIA:** Ten years continues to be a reasonable benchmark for return on debt. PWC/Incenta estimates that the average term of debt at issue for ASX listed regulated energy business at 10 years and longer terms for US and UK businesses. Shorter term creates costs associated with the need for more frequent refinancing that exposes the business to potential insolvency. AER should recognise not all firms with the same credit rating pay the same price for their debt. This militates against simply using the average of the relevant credit rating. Australian bonds should be used wherever possible. International bonds should only be used if AER develops a methodology for resolving the exchange rate risk.<br><br>**CitiPower, Powercor, SAPN:** Supports the use of Bloomberg BBB fair value curve extrapolated to 10 years. 10 years continues to be appropriate as it should reflect the average term of debt issuance for businesses with benchmark characteristics.<br><br>**ENA:** Benchmark efficient firm should be assumed to have gearing of 60 per cent, have a credit rating of BBB/BBB- (as the AER method underestimates the true return on equity in current market circumstances and Kanangra analysis estimates that the cash-flows are consistent with S&P rating of between BBB-to BBB), issue 10 year debt both domestically and internationally including some debt that has callable features (Note ENA submits 'just because Bloomberg fair value curves do not include the impact of callability or bonds issued in foreign currency does not provide a rational for the AER excluding these bonds in any analysis of raw |

data that it performs). Depending on the likely impact of any changes to the AER's return on equity methodology, it may support a benchmark credit rating higher than BBB/BBB-. ENA recognises three methods to extrapolate Bloomberg 7 year to 10 year value, these include use the difference between the 7 and 10 year yield from CEG approach, use the shape of the most comparable Bloomberg FVC which has yields between 7 and 10 years, paired bond analysis. Each methods has advantages and disadvantages, if a curve fitting methodology is used, CEG method is appropriate and allows automatic annual adjustments to the return on debt.

**Envestra:** In the absence of Bloomberg, a broad range of information should be used to derive the benchmark term of issuance and credit rating.

**MEU:** AER must recognise that the level of gearing and credit rating are closely intertwined and must be assessed together. A credit rating is not industry specific. If secure overseas debt is available and can be sourced at a lower cost, then this must be used as an element in setting the return on debt. The term of the debt should reflect the average across the wider market.

**NSW DNSP:** Support the adoption of a benchmark term to maturity of 10 year.

**PIAC:** There are reasons for choosing either a 5 year or a 10 year term for the debt. A longer term horizon would be more consistent with the long term interest of both consumers and investors and also appear to be more aligned with the long tenor of most of the NSP's debt portfolios. However, there is also merit in applying a 5-year debt term that is aligned with the regulatory period as it minimises the risk of significant spread emerging between the actual and the allowed rate of return. The issue may come down to the practicalities of each approach.

**QTC:** A 10-year term for the return on debt continues to be appropriate for a benchmark service provider with long-lived assets and above market average gearing. A firm's refinancing risk exposure is directly related to the average tenor of debt that is issued to refinance each maturing debt. A wide range of tenor should be considered, with the maximum tenor ideally being longer than the benchmark tenor. CEG's particular application of the Nelson-Siegel model assumes that the shape of the fitted yield curves is the same for different credit ratings, although the absolute level differs. Based on the current benchmark credit rating of BBB+, it would be reasonable to consider domestic and offshore debt issues with credit ratings of A to BBB-. The currency swapped yields on offshore debt issues made by Australian corporates should be considered. By estimating return on debt on a quarterly basis with each estimate being the average of the daily Bloomberg and Nelson-Siegel estimates during March, June, September or December, it reduces the impact of non-systematic estimation errors. This approach effectively gives a 2.5 per cent weight to each quarterly estimate.

**RARE:** Supports a longer term (10 year plus) for debt, given the long asset life of T&D networks.

**SP AusNet:** The benchmark efficient term of debt should remain at 10 years.

| Other return on debt issues raised | **APIA:** CEG report submitted by ENA found there are a wide variety of weights on energy firms' debt portfolios, both in Australia and overseas. Different weights might merely reflect different risk profiles at the relevant firms. If the AER wants to apply the same weighting to all firms, it needs to show different debt portfolio weights of different firms are due to inefficiency. |
| --- | --- |
| | **MEU:** Agrees with the AER that a predetermined weighting approach should be established which is a simple and has a consistent proportion applied for each year. |
| | **NSW DNSP:** Agree with the AER that trailing average should be calculated as a simple equal weighted average as it reduces the risk of estimation error. |
| | **PIAC:** Does not support weighting of the components of the portfolio as it would be based on the forecast profile of capital expenditure. However, the NSPs have no obligation to invest capital in accordance with that profile and this opens the door to further gaming. |

**QTC:** If the prevailing rates are below the average, a simple trailing average could give NSPs an incentive to overinvest. A simple average is likely to provide a net benefit to NSPs over the long run as NSPs can hedge future borrowings when prevailing rates are lower than the simple average. Weighted approaches (based on either the actual growth in the RAB or the investment profile in the PTRM) do not create opportunities for NSPs to gain excessive returns based on the assumption that service providers are not able to predict the future direction of interest rates. It is inappropriate to promote simplicity at the expense of other more important objectives. The appropriate approach is to determine the best method without any regard to the level of complexity and then progressively work backwards to determine if a less complex method can produce an estimate that is of similar quality.

Source:    AER analysis.

**Table A.2      Response to CRG verbal submissions**

| Issue raised at CRG or CRG subgroup meetings | AER response |
| --- | --- |
| It would be helpful if the AER could organise further education for consumers to assist in their understanding of rate of return issues. | On 4 April 2013 we held a training session that included a session on the rate of return. |
| Government owned businesses can access capital at the government borrowing rate but the return on capital does not reflect this. | We do not consider that a separate benchmark is required for government service providers (refer to section 3.3.4. of the explanatory statement). |
| Despite the Competition Neutrality policy and AEMC's rule change stating that the rate of return should be the same for government owned and private NSPs, the AER should look into having different rate of return because, government owned NSPs have lower costs of capital. | We held a subgroup meeting on this topic on 21 March. We indicated that this is an issue that cannot be resolved through our Better Regulation guideline development work. |
| Regulated entities have little, or no, exposure to risk which the rate of return is intended to compensate. | Our assessment of the risks associated with regulated energy businesses and the required compensation for risks is considered in section 3.3.2 of the explanatory statement. |
| The AER's principles for setting the rate of return should reflect the NEO, in particular the long term interests of consumers. | Our rate of return assessment 'criteria' (defined as 'principles' in the issues paper) reflect broadly the NEO, NGO, RPP and the allowed rate of return objective as outlined in chapter two of the explanatory statement. |
| If the businesses expect stability in prices, then it is customers who bear the risk. Accordingly, customers should be rewarded in the form of lower prices. | Our assessment approaches are aimed at achieving a rate of return which provides service providers with a reasonable opportunity to recover the efficient financing costs of a benchmark entity and smooths some of the volatility in the overall rate of return. To the extent that the volatility in the return on debt and equity is minimised this may reduce the overall rate of return. |
| An 'efficient firm' should reflect firms as they are now; the AER should look at non-electricity businesses for its benchmarking. | Firms operate under an incentive framework where they are rewarded for efficiency gains and penalised for efficiency losses. We consider that the risks which should be taken into account when setting the definition of the benchmark entity are those facing a regulated energy network operating in Australia. Entities operating in other sectors or in other markets are likely to face different risk exposures. |
| Concern that service providers' will 'cherry pick' models and approaches at each determination in terms of what suits them more. | With respect to the return on debt approach, this issue is considered in subsection 6.3.2 of the explanatory statement. We propose to use the Sharpe–Lintner CAPM as the foundation model. The way we use this model and other models is detailed in chapter five. |
| The guideline needs to keep the long run interests of | Our rate of return assessment 'criteria' (defined as 'principles' |

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| consumers as the key focus. The rate of return principles should state this goal clearly. | in the issues paper) reflect broadly the NEO, NGO, RPP and allowed rate of return objective as outlined in chapter two of explanatory statement. |
| Government owned network businesses benefit from both: 1) cheaper finance and 2) passing on their inefficiencies.<br><br>The main complaint has been that government get unfair advantage under benchmarking approach because they have cheaper finance than private sector businesses. | We do not consider that a separate benchmark is required for government network businesses (refer to section 3.3.4 of the explanatory statement). We note that Government businesses are subject to the same efficiency incentives under the regulatory framework as privately owned businesses. We consider that any business specific inefficiencies should be addressed within the opex and capex assessments. |
| Multiple benchmarks will make benchmarking ineffective - service providers have a tendency to keep stating their differences to avoid efficiency comparisons. | We considered the risks facing regulated energy network businesses and the mitigating effect of the regulatory framework. We concluded that the risks are not sufficiently dissimilar to warrant more than one benchmark entity (see section 3.3.2of the explanatory statement). |
| The AER needs to demonstrate why the model it adopts achieves better outcomes for consumers. | Our rate of return assessment methodology has been derived to meet the NEO, NGO and RPP. This means that we have derived an assessment approach which balances the requirement to provide business with an opportunity to recover the efficient cost of providing network services, while ensuring investment levels which best serve the long term interests of consumers. |
| Consumers generally favour approaches that minimise gaming opportunities. The best way to achieve that outcome seems to be an approach which has less choice for service providers. | This issue is considered in subsection 6.3.2 of the explanatory statement. |
| Consumers would prefer the AER to use one benchmark firm for determining a benchmark rate of return. The risk of using more than one benchmark firm would be that the businesses could potentially use benchmarks that suit them. Consumers do not consider that businesses should be treated differently without robust reasoning. | We considered the risks facing regulated energy network businesses and the mitigating effect of the regulatory framework. We concluded that the risks are not sufficiently dissimilar to warrant more than one benchmark entity (see section 3.3.2 of the explanatory statement). |
| The AER should base its approach on capital intensive businesses' practices. The AER may need to undertake research to do this. | We considered the risks which regulated energy networks face and the mitigating impact of the regulatory regime in determining the benchmark entity. We estimate the rate of return for this benchmark entity.<br><br>As discussed in section 6.3 of the explanatory statement, our preferred approach to estimating the return on debt is consistent with the actual debt management approaches of non-regulated businesses. |
| The rate of return needs to reflect actual financing: if it is too low the service providers won't spend the money, if it is too high, they will overspend. | The NER and NGR require that rate of return for service providers 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. |
| Consumers do not like big shocks, particularly lower and medium consumers. Consumers would prefer a balanced approach over time that allows for wins and losses. | Our approach to both the return on equity and return on debt assessments are expected to reduce the volatility in the rate of return. For example, the change to a trailing average approach will smooth the estimate of the return on debt compared with the 'on the day' approach. This issue is considered in subsection 6.3.4 of the explanatory statement. |
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| The AER's research into the risks faced by service providers should include a consideration of how service providers | We considered the assessment of risk provided by credit ratings agencies, which is used by investors to inform their |

present themselves to investors. Further, looking at how the business compares its individual investment risks to the market as a whole would be a good platform to analyse their risks on their return on equity and benchmarking.

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| The AER needs to explain the process, how it is going to apply the rate of return criteria and weight to different models and other information. It needs to demonstrate why the model it adopts achieves better outcomes for consumers. | The process we propose to apply to the rate of return criteria and weight to different models is outlined in chapter 5 and appendix E. |
| Is the guideline intended to say that there is a 'foundation' model? CRG agree to use Sharpe–Lintner CAPM as a 'foundation' model. | Yes as, the guideline identifies the Sharpe–Lintner CAPM as the foundation model. This issue is discussed in section 5.3 of the guideline and chapter five of the explanatory statement. |
| Does the AER intend to use the Sharpe–Lintner CAPM to estimate a range or point estimate? | Sharpe–Lintner CAPM will be used to estimate both a range and a point estimate. This is discussed in section 5.3 of the guideline and chapter five of the explanatory statement. |
| How is the DGM used to estimate return on equity? | The way in which the DGM will contribute to the return on equity is discussed in section 5.3 of the guideline and chapter five and appendix H of the explanatory statement. The reasons for the role that each model will play in estimating the return on equity are discussed in appendix F of the explanatory statement. |
| How is the FFM used to estimate return on equity | The Fama–French three factor model is assessed in appendix E. The model's intended use is discussed in section F.4.1 of the explanatory statement. |
| CRG consider the data to be used in the Sharpe–Lintner CAPM is well established. How does this compare to the data for other models?<br><br>What is Wright model? | We considered the availability of credible datasets when selecting the models to estimate the return on equity. This is discussed in appendix E. An explanation of the Wright model can be found in section F.3.1 of the explanatory statement. |
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| Can the AER explain the impact of the GFC on parameters' value? | We had explicit regard to the impact of the GFC in the AER's 2009 WACC review. The explanatory statement to this review outlines our considerations. Under the new rules, the parameter values used to estimate the allowed rate of return would reflect the changing conditions in the financial markets, as appropriate. |
| The benchmark efficient financing cost allowed by the AER is higher than the actual debt raising cost for businesses. As a result the consumers are paying more than the actual debt raising cost of business. | The allowed rate of return is determined for a benchmark efficient entity (see chapter three of the explanatory statement). This maintains the incentive for service providers to pursue efficient financing practices. To the degree that a specific firm is more efficient than the benchmark, it keeps those returns. To the degree that a specific service provider is less efficient, it bears the cost. |
| Higher return on debt allowed by AER is providing incentives to businesses to overinvest and consumers are paying higher energy cost. | We sought the rule change 'to protect consumers from paying more than necessary for a safe and reliable energy supply'.[392] The amended rules aim to allow us to 'better respond to changing financial market conditions, particularly where volatile market conditions impact on a service provider's ability to attract sufficient capital to finance the expenditure |

required return on debt (see section 3.3.2 of the explanatory statement).

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[392]    AER, *Promoting efficient investment – protecting consumers from paying more than necessary, Executive Briefing, Energy network regulation reform*, September 2011, p. 1.

necessary to provide a reliable energy supply to consumers.'[393]

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| Why can't the AER provide the incentives to service providers to reduce their return on debt and pass on benefits to consumers? | Our proposed return on debt approach is based on the efficient debt financing costs of the benchmark efficient entity. The approach is detailed in chapter six of the explanatory statement and chapter six of the guideline. As the return on debt allowance is specified ex ante, it provides service providers with incentives to minimise their debt financing costs, taking into account broadly defined transaction costs and risks they face. As long as the benchmark efficient entity and the allowed rate of return on debt are determined in the way consistent with the rules, the NEL, NGL, NEO, and NGO, the return on debt will reflect the market conditions and risks service providers face. Overall, our proposed approach takes into account the desirability of minimising any substantial mismatch between the return on debt and the regulatory allowance. |
| The data used by the AER in assessing the proposed allowed return on equity should include the actual performance achieved by the service providers in the past with this compared to the allowed return on equity.<br><br>On further thinking about this perhaps the actual outcomes could be moderated to reflect that the return on equity incorporates the impacts of differences between actual and forecast outcomes relating to the return on debt, opex, capex and consumption (for price caps) which are all seen to affect the return on equity. | The NER and NGR require that rate of return for service providers 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. |
| The AER is considering that the return on debt be set using Bloomberg data on Australian corporate bond portfolio using a trailing average approach.<br><br>It was observed that the regulatory regime is an incentive regime and the consultation paper frequently observes that there should be an incentive on the service providers to seek lower costs of debt. However, there is no sharing with consumers proposed should service providers be more efficient in their debt acquisition, so why should consumers pay any premium for the provision of debt, especially as service providers would seek lower costs of debt in the interests of their shareholders anyway? | As discussed above, our proposed return on debt approach is based on the efficient debt financing costs of the benchmark efficient entity. The approach is detailed in chapter six of the explanatory statement and chapter six of the guideline. As the return on debt allowance is specified ex ante, it provides service providers with incentives to minimise their debt financing costs, taking into account broadly defined transaction costs and risks they face. As long as the benchmark efficient entity and the allowed rate of return on debt are determined in the way consistent with the rules, the NEL, NGL, NEO and NGO, the return on debt will reflect the market conditions and risks service providers face. Overall, our proposed approach takes into account the desirability of minimising any substantial mismatch between the return on debt and the regulatory allowance. |
| It was also observed that in the ACCC RBD paper and the Partington report that debt acquired using corporate bonds is at a higher cost than other forms of debt more commonly used (the RBD paper notes that service providers on average only access about 30 per cent of their debt using Australian corporate bonds). Therefore using Australian corporate bonds as the basis for setting the return on debt results in a premium being included in the calculation of the return on debt under the model being considered by the AER. | We propose to use the published yields from an independent third-party data service provider to estimate the prevailing return on debt (see subsection 7.3.1 of the explanatory statement for further detail). Therefore, given the benchmark credit rating and the benchmark term of debt, the set of underlying debt instruments determining the allowed return on debt estimate would depend on the selected third-party data provider. |
| It has been seen empirically that using Bloomberg data has resulted in higher costs for debt than has been incurred by service providers issuing Australian corporate bonds. This | The issue of the benchmark term is addressed in subsection 7.3.3 of the explanatory statement. The transitional approach to the return on debt is discussed in subsection 6.3.7 of the |

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[393]    AEMC, *Economic Regulation of Network Service Providers, and Price and Revenue Regulation of Gas Services, Final Position Paper*, 29 November 2012, Sydney, p .iii.

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| results in a further premium on to the allowed return on debt under the model being considered by the AER. | explanatory statement. |
| The AER agreed to look at how this premium might be adjusted out but retaining the simplicity of the approach being considered. Two approaches were 'floated' to reflect this. | |
| 1. Using a five year benchmark term for the portfolio, rather than a longer term. | |
| 2. The actual cost of debt incurred by service providers to be set as the return on debt for the start of the period, and assume a portfolio approach. Bloomberg data would be used as the surrogate for setting the cost for replacing each tranche of debt portfolio that is assumed to fall due each year of the regulatory period. This would provide an incentive to the service providers and provide consumers with the benefits of the lower debt costs the service providers achieve. | |
| The main concern CRG expressed at the meeting on the 19th July, related to the ENA's claim: 'It is clear that most customers highly value pricing stability'. The ENA does not indicate how it came to that conclusion or cites any references/articles/submissions or whatever. Nevertheless, it is true that consumers have supported the principle of pricing stability but with the proviso that this stability should not come at a cost to consumers that exceeds this benefit. That is, if stability in pricing is 'bought' at a high premium, then it is not supported - or at least not supported with much further investigation of the trade-offs between stability and price. For example, consumers are already 'giving up' the potential benefit of applying the 'on the day' approach in the long-term interests of consumers. However, if this shift involved transitional processes in which the NSP captures some additional value, then consumers might well consider the cost to high. | We recognise the trade-off between price volatility and price level noted by the CRG. The process of transition is considered in section 6.3.7 of the explanatory statement. Price volatility in relation to the return on debt estimation is considered in section 6.3.4 of the explanatory statement. |

Source:     AER analysis.

# B  Benchmark efficient entity and compensation for risk

In assessing the extent to which various risks should be incorporated in the WACC, Frontier segments the risks into two broad classes: business risks and financial risks.[394] Analysing these risks can provide guidance on:

- whether the risks for regulated energy infrastructure businesses are significantly different from the market average

- whether the risks for the regulated energy businesses are similar to other regulated infrastructure businesses

- whether the risks for sub-groupings of regulated energy businesses are significantly different.

Depending on the answers to these questions the benchmark efficient entity may be more widely or narrowly specified.

## B.1  Energy businesses exposure to individual risks

Risks which may influence the required rate of return are:

- Business risks

  The business risk is the risk inherent in the asset. The extent to which these are systematic risks can be measured by the covariance of returns on the asset with returns on the market portfolio. Determinants of systematic (non-diversifiable) asset risk are the inherent volatility of the returns and how strongly they are correlated with the business cycle (more volatility and higher correlation with the business cycle leads to a higher covariance risk for revenue and hence for the asset). The covariance risk can be levered up by substituting fixed costs (operating leverage) for variable costs. Hence more volatile and more cyclical revenues and more fixed costs, tend to increase the asset beta.

  Business risk is shared between equity and debt holders. For example, to the extent that debt holders face a positive probability of default due to systematic risk they are bearing some of the systematic business risk facing the firm.

- Financial risks

  For equity holders, the equity beta can be levered up to a level above the asset beta by the addition of further fixed costs in the form of payments to debt-holders. As shareholders are residual claimants to the cash flows, more debt gives rise to increased risk to shareholders. The extra leverage increases both the variance and covariance with the market of shareholder expected returns. Financial risk also includes default risk. This is where the possibility of financial distress (default) reduces the expected cash flow to shareholders.

  For debt holders, promised rates of return may include compensation for systematic, credit and liquidity risk. Valuation of all debt is affected by changes in variables, such as the level of interest rates and changes in the rate of inflation. With respect to interest rate changes, both changes in

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[394]  Frontier Economics, *Assessing risk when determining the appropriate rate of return for regulated energy networks in Australia, A discussion paper prepared for the AER*, May 2013, p. 1.

the level of interest rates and the term structure are potential risks. Credit risk includes the risk of default and the risk of rating downgrades.

We consider that a regulated energy business may be exposed to a range of business and financial risks (see tables 3.1 and 3.2). Each of these risks is discussed below. The expected covariance between the firm's cash flows and the systematic risk factors faced by portfolio investors may be positive or negative. The overall risk exposure is the result of both the sign and magnitude of the individual risk impacts.

## Demand risk

Demand risk is the risk that actual future demand for a firm's output does not match forecast demand. Because of the lead time in investing in new capacity for future demand this can result in over- or under- investment. The financial impact of demand risk will depend on the variability of revenues and costs to changes in demand in the short term and the scope to defer or accelerate capital expenditure as variations for forecast demand emerge.

We consider that demand risk is caused by both systematic and non-systematic risks, driven by the business' type of end user/ consumer, and influenced by the level of competition to which the business is exposed and the form of regulatory control to which the business is subject.

Price structures and the regulatory form of control to which the business is subject can very significantly mitigate the impact of demand risk.

Electricity transmission service providers are subject to a revenue cap under the NER.[395] Electricity distribution businesses and gas distribution and transmission businesses are able to nominate either a revenue cap or price cap.[396] We can specify the price control to apply. However, we have full discretion to approve the nominated form of control.[397] Generally it will approve either a price or revenue cap. We have also previously indicated a preference for revenue caps (i.e. the form of regulatory pricing control that places the least demand risk on businesses).[398]

A revenue cap reduces the risk a service provider is exposed to due to an error in the demand volume forecast as service providers recover a specified level of revenue (in net present value terms) for that year, regardless of actual demand. Under a revenue cap, any under- or over- recovery of revenue in a given year due to fluctuations in demand is recovered through prices in following years. A service provider faces very limited revenue risk in net present value terms under a revenue cap.

Under a weighted average price cap a service provider is able to adjust prices each year as long as the volume-weighted average change does not exceed the cap (on the amount by which prices may change each year). The service provider faces the risk that the regulator or the business makes an error in forecasting the expected volume of demand at the time of the determination. Therefore, the service provider is exposed to some revenue risk from demand uncertainty. However, regulated energy service providers will face lower revenue and profit variability due to changes in demand than other types of businesses due to the highly inelastic and stable demand for energy. Service providers are also able to structure their tariffs to reduce revenue risk and variability (i.e. by increasing fixed

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[395] NER, cl. 6A.4.2(1).
[396] NER, cl. 6.2.5(b), NGR, r. 97(2).
[397] NGR, r. 79(3).
[398] AER, *Discussion Paper, Matters relevant to the framework and approach, ACT and NSW DNSPs 2014–2019: Control mechanisms for standard control electricity distribution services in the ACT and NSW*, April 2012, p. 15; AER, *AER speaking points – AEMC demand workshop*, 28 February 2013, p. 6.

charges and reducing variable charges). These price structures provide a better alignment to the limited short term variability in their costs. In addition, as noted above, service providers are able to choose a revenue cap. They would not be expected to choose a price cap if it was wealth decreasing for their shareholders.

The regulatory framework also allows for the recovery of sunk assets, where there has been over investment in assets due to errors which overstate demand, thereby mitigating the demand risk associated with over investment in assets. This is subject to a finding on ex-post review that the over investment is efficient, and for electricity network service providers, that additionally the over investment does may not include related party margins nor opex amounts reclassified as capex.[399] Furthermore, for electricity network service providers, the over investment is subject to the proposed capital expenditure sharing scheme.[400] The AER is proposing to make electricity network service providers bear 30 per cent of any overspend.[401] For electricity network service providers once the assets are included in the RAB, assets cannot be optimised out under the NER. Under the NGR, redundant assets are able to be rolled out of the RAB.[402] However, if they return to use, they may be rolled back into the RAB.[403]

Where there is potential for under-investment in areas which drive revenue (e.g. customer connections), the regulated capex allowance tends to be reprioritised by the business towards these areas, while other more discretionary projects are delayed. Notwithstanding the potential for re-prioritisation, a NSP will earn additional revenue from customer connections above forecast which is expected to offset any additional customer costs. There is the potential for additional revenue to be earned from the reprioritised, additional investment. Any capex projects subject to delay are able to be reproposed in the next regulatory period. Hence the demand risk associated with under-investment is mitigated by the ability to repropose areas where the proposed investment has been delayed. For electricity service providers the under investment is subject to the proposed capital expenditure sharing scheme.[404] The AER is proposing to allow electricity network service providers to keep 30 per cent of any under spend.[405]

We also note that service providers can face increased or decreased demand relative to that forecast and we do not generally expect this risk to be asymmetric.

## Input cost risk

Input cost risk is where the forecast input cost (both volume and price) differs from the actual input cost for opex and capex. We consider that this risk is primarily systematic and driven by inflation risk, which should be fully compensated through the WACC.

Service providers should not be compensated for inefficient cost overruns. Service providers manage some volatility in input costs and associated exchange rates, where goods are sourced offshore, through hedging.[406]

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[399] NER, cls. S6.2.2A and S6A.2.2A and NGR, r. 77(2)(b).
[400] NER, cls. 6.4A and 6A.5A.
[401] AER, *Better Regulation: Draft Capital Expenditure Incentives Guidelines*, August 2013, p. 6.
[402] NGR, r. 77(2)(e).
[403] NGR, r. 86.
[404] NER, cls. 6.4A and 6A.5A.
[405] AER, *Better Regulation: Draft Capital Expenditure Incentives Guidelines*, August 2013, p. 6.
[406] For example, DUET's 2012 annual report notes that UEDH purchased interval meters as part of its smart meter rollout program in USD and that it hedges the foreign exchange risk arising from the purchases using foreign exchange contracts.

Efficient cost overruns are absorbed under the regulatory framework, where actual capital expenditure, if determined to be prudent and efficient[407], is rolled into the regulatory asset base. However, the associated financing costs are not realised for the remainder of the regulatory period. For opex, cost overruns are captured to the extent that they are included in the base year. For electricity network service providers, the inclusion of the cost overrun is also subject to assessment under the capex expenditure sharing scheme[408] and the opex efficiency benefit sharing scheme[409]. Under the proposed capital expenditure sharing scheme we propose to make electricity network service providers bear 30 per cent of any overspend.[410] The proposed opex efficiency benefit sharing scheme provides for an NSP to wear the costs of an incremental efficiency loss in opex for six years regardless of when the loss is made.[411]

Service providers also have available to them reopening[412] and cost pass through provisions[413]. Under these provisions, regulated energy service providers are exposed to lower input cost risk than other businesses more generally.

We also note that service providers can face both cost overruns and cost underruns and we do not generally expect this risk to be asymmetric.

### Cost volume risk

Cost volume risk is where there is uncertainty surrounding the quantity of inputs, or the time required to deliver a particular output. The regulatory framework mitigates this risk for service providers by enabling businesses to roll any cost overrun (over the total approved capex allowance) associated with the error in forecasting the volume of inputs, where prudent and efficient, into the regulatory asset base. However, service providers are not compensated for the financing costs for this expenditure (noting financing costs associated with cost overruns are also not clawed back). In addition, to the extent cost overrun risk is project specific, much of this risk is likely to be diversified away across projects. Volumes are likely to be less of an issue for opex because opex is relatively more recurrent and predictable. However, to the extent that a cost overrun was included in the base year, it would be captured. As described for input cost risk, the inclusion of the cost overrun for electricity network service providers is also subject to assessment under the capex expenditure sharing scheme[414] and the opex efficiency benefit sharing scheme[415]. Under the proposed capital expenditure sharing scheme, we propose to make electricity network service providers bear 30 per cent of any overspend.[416] The proposed opex efficiency benefit sharing scheme requires that service providers should wear the costs of an incremental efficiency loss in opex for six years regardless of when the loss is made.[417] Where projects extend beyond the regulatory period in which it was approved, a business is able to repropose the project for funding in the next regulatory period thereby removing this portion of the risk. There are also pass through and contingent project provisions available to businesses under the regulatory regime.

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[407]    This is subject to a finding on ex-post review (under NER, cls. S6.2.2A and S6A.2.2A and NGR, r. 77(2)(b)) that the cost overrun is efficient, and for electricity network service providers, that additionally the overinvestment does not include related party margins nor opex amounts reclassified as capex.
[408]    NER, cls. 6.4A and 6A.5A.
[409]    NER, cls. 6.5.8 and 6A.6.5.
[410]    AER, *Better Regulation: Draft Capital Expenditure Incentives Guidelines*, August 2013, p. 6.
[411]    AER, *Electricity Network Service Providers: Proposed Efficiency Benefit Sharing Scheme*, August 2013, p. 5.
[412]    NER, cls. 6A.7, 6A.8, 6.6.5.
[413]    NER, cls. 6A.8, 6.6A
[414]    NER, cls. 6.4A and 6A.5A.
[415]    NER, cls. 6.5.8 and 6A.6.5.
[416]    AER, *Better Regulation: Draft Capital Expenditure Incentives Guidelines*, August 2013, p. 6.
[417]    AER, *Electricity Network Service Providers: Proposed Efficiency Benefit Sharing Scheme*, August 2013, p. 5.

We also note that cost volume risk is not generally expected to be asymmetric and where it has been shown to be asymmetric we have made allowances for it in the regulated cash flows (for example in transmission distribution, transmission service providers have been able to claim a risk adjustment factor for systematic bias in project cost estimation).

## Supplier risk

Supplier risk is where third party suppliers of material or labour fail to deliver the goods or services agreed to. We consider that supplier risk is driven by both systematic and non-systematic factors.

Suppliers in the energy area are generally large and financially stable. Service providers manage supplier risk through longer term contracts, contracting in advance, stage payments as work is completed, sharing work between contractors to ensure a broad contractor base, and through establishment of supplier panels.

Overall, we consider that supplier risk is minimal for regulated energy service providers. Furthermore, it is appropriate that the service providers manage this risk as it is within their locus of control and it should therefore not be compensated through the expected rate of return.

## Inflation risk

Inflation risk is the risk of actual inflation varying from expected inflation. We consider that inflation risk is a systematic risk.

Under the CPI-X regulatory framework, the annual inflation adjustment to revenues or prices is based on actual outturn inflation with a one year lag, thereby removing a large component of this risk.[418] To the extent that this risk remains, it is not expected to be asymmetric in nature and should be adequately compensated for through the WACC.

## Competition risk

Competition risk refers to the risk associated with new entry or expansion of existing rivals, or cross-sectoral competition. Competition risk impacts systematic risk and may have a magnifying effect on other risks.

By virtue of being regulated, we consider that a regulated electricity or gas business is unlikely to face material risk of competition from a new entrant or expansion of a rival business in the same fuel.

However, in relation to cross sectoral competition, gas may be considered a fuel of choice, while electricity is considered to be an essential service. Hence, it may be argued that gas businesses are threatened by competition from electricity businesses within a specific geographical area. This may be

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[418] Envestra acknowledges this in its 2012 annual report: "The Group's exposure to movements in the CPI through its Capital Indexed Bonds is partially offset by the annual resetting of haulage tariffs in line with the CPI, together with the re-setting of the regulatory asset base at five-yearly intervals to reflect changes through the period in CPI". DUET in its 2012 Annual Report comment that: "United Energy has entered into indexed CPI (Consumer Price Index) swaps together with cross currency interest swaps that effectively hedge interest rate and CPI risk" and " Energy Partnership (Gas) Pty Ltd (EPG), a subsidiary of Multinet, is a regulated distribution business which operates in an environment where an Independent Regulator (the Australian Energy Regulator) determines the tariff regime every 5 years. The tariff for each of the 5 years is set as a function of the prior period tariff and an escalation based on CPI. EPG sought to replicate the revenue indexation assumptions used in the regulatory determination by entering into a CPI revenue swap with its hedging counterparties. The hedging structure is such that EPG's base revenue is swapped from floating escalation to fixed escalation at an agreed annual escalation rate for 5 years starting from January 2008".

exhibited in two ways: a reduction in new customer uptake; and the switching of existing customers from gas to electricity.

New customer uptake is forecast in advance through information garnered from developer approaches/negotiations and marketing responses. The rate of household/industrial switching is slowed by the sunk investment in relatively long-lived gas-consuming assets (e.g. ducted heating, oven, wall heaters, furnaces, etc). This also allows the volume of households/commercial premises switching to be forecast in advance, taking into consideration changes in relative efficiencies and costs of competing gas- and electricity- consuming assets. Where service providers forecast bypass or underutilisation of assets, they are able to recover foregone revenues from other customers through prudent discount regimes, or through accelerated depreciation arrangements approved by the regulator.

To the degree that the rival is regulated they will be limited in how much they are able to change their prices to impact the relative gas/electricity price. We consider it is unlikely that prices could be moved sufficiently to entice a very material shift in demand from one fuel to the other.

## Stranding risk

Stranding risk refers to the risk that regulated cash flows are insufficient to recover the asset value in present value terms due to a massive downturn in demand. It can be driven by systematic or non-systematic risks.

The regulatory framework provides for assets to be rolled into the regulatory asset base. For electricity service providers there is no subsequent optimisation of the regulatory asset base, thereby mitigating this risk (as long as other asset revenues can cover the revenue loss associated with the redundant asset). For gas service providers, there is provision for assets which are assessed to be redundant to be rolled out of the regulatory asset base.[419] However, the NGR set out that 'the AER must take into account the uncertainty such a mechanism would cause and the effect the uncertainty would have on the service provider, users and prospective users'.[420] The NGR also provide for the redundant asset to be rolled out in a future access arrangement[421] and for costs to be shared between the service provider and users[422]. Where assets resume being used to provide pipeline services they are able to be rolled back into the regulatory asset base.[423]

We consider the risk of stranding is immaterial for regulated energy service providers in Australia.

## Political risk

Political risk is the variation in a firm's returns which is attributable to the decisions of a government. We consider this is largely systematic, symmetrical risk. However, we consider political risk can be non-systematic where it is industry, or firm specific.

The regulatory framework mitigates political risk via the pass through mechanism and other re-opening provisions.

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[419]     NGR, r.85.
[420]     NGR, r.85(4).
[421]     NGR, r.85(2).
[422]     NGR, r.85(3).
[423]     NGR, r.86.

To the extent political risk requires investor compensation in Australia we consider it will be reflected in the Australian market risk premium, the yield on the Australian risk free rate, and the yields on Australian firms' debt (i.e. in the regulated WACC).

## Regulatory risk

Regulatory risk is the variation in a firm's returns which is attributable to the decisions of the rule making authorities (e.g. AEMC, state governments) or the regulator. This will also include risk associated with legal decisions made under the regulatory regime (noting the legal appeal mechanism also mitigates some risk associated with regulatory decisions). We consider regulatory risk is largely symmetric and non-systematic. The magnitude of the risk depends upon the level of discretion available to the regulator, the predictability of the decision making process, and the legal protection afforded by appeal provisions within the legislation.

We note that by changing the sensitivity of cash flows relative to market movements, predictable regulatory decisions may change the business risk exposure. For example, shortening the tenor of debt on the debt risk premium could lead the business to mirror that tenure in its debt structure which may cause an increase in the service providers' refinancing risk. On the other hand, cost pass through and reopening provisions within the regulatory framework reduce the risk of cash flow variations compared with market movements, thereby reducing the business' risk exposure.

The risk of unpredictable regulatory decisions is reduced by having separation between the rule maker (AEMC) and the regulator, by requiring the regulator to consult and release guidelines on the regulator's interpretation of the rules in many situations, and by providing service providers with the ability to appeal the regulator's decision.

To the extent that any residual regulatory risk is symmetrical and non-systematic, we do not consider it requires any extra compensation.

## Other business risk

Low probability/high cost events (e.g. bushfires) or damage caused by third parties may have a large impact on the service providers' cash flows relative to movements in the market. The regulatory framework addresses these risks by allowing self-insurance costs, or through providing cost pass throughs.

Credit risk, where customers fail to meet their agreements, is largely centred on large retailers. Energy service providers manage this risk by requiring payment in advance or bank guarantees from retailers which do not possess investment grade credit ratings. The regulatory regime permits an allowance for expected credit losses due to default.

In its submission, APA Group list three additional business risks for consideration: engineering and design risk, construction risk and operational risk.[424] It does not however discuss these risks any further. From an investor's perspective these risks are considered to be largely firm specific and so diversifiable. As discussed above, we note that asymmetric construction risk related to transmission projects may be allowed for in the ex-ante regulatory cash flow allowances if firms can quantify this risk.

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[424]    APA, *Submission to the consultation paper*, June 2013, p. 4.

## Refinancing risk

Refinancing risk is the risk that when a business refinances its debt, the interest rates are higher or lower than the rates the business currently pays, or it cannot access all of its refinancing needs. We consider that this may be driven by both systematic and non-systematic risks.

Service providers manage this risk by entering into longer term debt, by staggering the volume and maturity dates, by having diversified debt sources (that is, by having differing proportions of the debt portfolio in bank debt, Australian bond issues and offshore bond issues), by arranging refinancing well in advance of debt maturing, and by keeping spare debt capacity.

While the level of refinancing risk may have increased due to increased interest rate volatility and falls in government bond yields, the relative risk of energy businesses compared with other businesses more generally has not.

We consider any refinancing risk should be immaterial and adequately compensated through the regulated WACC.

## Interest rate reset risk

Interest rate reset risk is the risk that the allowed cost of debt does not match the business' actual cost of debt. This risk may be attributable to a term premium mismatch between the benchmark assumption and the businesses actual term of debt, estimation error, or inefficient financing practices. As this is driven by service providers' individual financing practices we consider this is firm specific, non-systematic risk.

We consider that individual financing practices should not be rewarded by compensating through the benchmark WACC. Service providers are free to move away from the benchmark. Where they do, it may be presumed that there are efficiencies underpinning the rationale to do so. Furthermore there is the incentive for the service providers to better the benchmark WACC, retaining any differential between the allowed and actual rate of return.

Service providers manage this risk by entering into interest rate swaps which lock in their cost of debt in alignment with the benchmark cost of debt at the start of the regulatory period for the base rate (proxy for the risk free rate). Service providers[425] and banks have advised that this is a typical business practice and that there is no evidence that there is difficulty in obtaining swaps to effectively manage their interest rate risk.

McKenzie and Partington submit that it is not clear how interest rate risk covaries with financial risk.[426] They state that given the low default risk in regulated utilities, these financial risk effects are unlikely to be substantial in normal market conditions.[427]

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[425]  Envestra indicates in its 2012 annual report that it undertakes this practice: "The Group manages its cash flow interest rate risk by using floating to fixed interest rate swaps. They have the economic effect of converting borrowings from floating rates to fixed rates. Generally, the Group raises long-term borrowings at floating rates and swaps them into fixed rates that match the rates used in the relevant regulatory determination for a term matched to the relevant regulatory period." Similarly DUET in its 2012 annual report states that "[s]waps in place cover approximately 100% (2011: 100%) of the loan principal outstanding and are timed to expire as the loan repayments are due or to coincide with the next prevailing regulatory reset."

[426]  McKenzie, M and G. Partington, *Report to the AER: Risk, asset pricing models and WACC*, June 2013, p. 6.

[427]  McKenzie, M and G. Partington, *Report to the AER: Risk, asset pricing models and WACC*, June 2013, p. 13.

We consider interest rate reset risk is likely to be immaterial under the current approach given we consider firms can hedge over the averaging period and we consider this risk will reduce even further with the proposed use of a trailing average with annual updates. The trailing average approach with annual updating is expected to reduce the risk of mismatch (see section 6.3.6).

### Liquidity risk

Liquidity risk is the risk arising from investors' uncertainty over whether they will be able to trade a given asset at some point in the future. The value that investors place on liquidity of an asset and the risk that it may not be realised results in a liquidity premium. We consider that this risk may be driven by both systematic and non-systematic factors.

Frontier Economics state that there is a tendency for the equity of small firms and privately owned businesses to be less liquid than equity on large, listed firms.[428] It examined the market capitalisation size of Australian energy service providers and found that seven were large cap, twenty were medium cap and five were small cap. Frontier concluded that the mid and large cap firms are unlikely to have a size-driven liquidity problem, while illiquidity may be more of an issue for the five small cap networks.[429]

Regulation mitigates some of the information asymmetry which may underpin illiquidity. Frontier Economics submit that due to the thin Australian bond market, entities are sourcing capital offshore. Offshore markets typically have minimum issuance requirements, which means these markets are either unavailable or are accessed less frequently by smaller business. Frontier Economics states that illiquidity may be an issue for small energy businesses.[430]

However, the AER does not consider that liquidity risk requires extra explicit compensation for any of the regulated energy businesses in Australia.

### Default risk

Default risk is the risk that the cash flows generated by the service provider are insufficient to cover its debt obligations. Default risk is influenced not only by the volume of a business' cash flows but also by the variability in those cash flows. We consider that this risk is driven by both systematic and non-systematic factors.

Energy service providers are highly leveraged which increases their default risk due to the magnitude of their fixed debt obligations. However, being regulated service providers for an essential service they also have stable cash flows.

Historically, default of regulated energy service providers has been rare. This is attributed to the strong incentives for businesses to maintain investment grade credit ratings. These incentives are created by the regulator, which generally benchmarks the rate of return to an investment grade credit rating and by the requirement that in order to attract large institutional investors, stable returns are required.

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[428] Frontier Economics, *Assessing risk when determining the appropriate rate of return for regulated energy networks in Australia: A report prepared for the AER*, June 2013, p. 28.

[429] Frontier Economics, *Assessing risk when determining the appropriate rate of return for regulated energy networks in Australia: A report prepared for the AER*, June 2013, pp. 29-30.

[430] Frontier Economics, *Assessing risk when determining the appropriate rate of return for regulated energy networks in Australia: A report prepared for the AER*, June 2013, pp. 29-30.

Default risk is generally lower for regulated energy businesses than businesses generally.

We note that the expected cost of default is reflected in the YTM on debt (and therefore in the regulated WACC), even though the firm will not have to pay its debtors the cost of default in the event of default. However, we note that some of this expected cost of default will be due to expected transaction costs associated with default and will not be expected to flow through to the regulated firm's equity holders.

### Financial counter party risk

Financial counter party risk is where third parties (e.g. banks, insurance firms) do not deliver on their obligations with the service provider. In normal economic environments financial counter party risk is low. We consider that this is primarily a non-systematic risk.

Service providers manage counter party risk by ensuring counterparties have high credit ratings and by diversifying the parties with whom debt is arranged. Envestra comments that '[d]erivative counterparties … are limited to high credit quality financial institutions. The Group has policies that limit the amount of credit exposure to any one financial institution. Counterparty limits for investment and hedging transactions are measured by reference to transaction limits set by the Board in relation to the counter parties' external credit ratings'.[431] There is no evidence to suggest that this risk is material for regulated energy businesses relative to service providers generally.

## B.2    Issues raised in submissions

### When the benchmark efficient entity definition should be determined

APA Group submitted that the benchmark efficient entity should be established at each regulatory determination.[432]

We consider that this approach would create unnecessary uncertainty. As there are decisions regarding models and parameters which are informed by the definition of the benchmark efficient entity, leaving open the assessment of the benchmark efficient entity could also potentially give rise to uncertainty about which models and parameters may be applied in a determination. We expect that the risk magnitude or relativity for energy businesses compared with that borne by broader business will not change materially between the setting of these guidelines and the next WACC Review. Our assessment is therefore not expected to change substantially between determinations. We therefore consider that there are insufficient grounds for leaving open the definition of the benchmark efficient entity given the uncertainty this would create.

### Risks to be compensated through the rate of return

The EUAA noted McKenzie and Partington's view that it is preferable for risks to be compensated through cash flows than through the discount rate. It also commented that Frontier's analysis of the financial and business risks indicated that the risks are effectively compensated through cash flows as a result of the regulatory regime, and that consequently a lower WACC is needed.[433]

In relation to which risks should be compensated through the rate of return, ActewAGL submitted that there may be 'multiple dimensions' to systematic risk, which is not captured by the CAPM and for

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[431]    Envestra, *Annual Report 2012*, September 2012, p. 52.
[432]    APA, *Submission to the consultation paper*, June 2013, p. 4.
[433]    EUAA, *Response to the consultation paper*, June 2013, p. 6.

which some international regulators make adjustments.[434] APA Group and APIA stated that the risk specified in the allowed rate of return objective is not the risk premium captured by the CAPM but refers to the variability in the returns of the service provider.[435] APA Group listed the risk factors it considered relevant but did not specify why or how they should be included in the rate of return.[436]

Envestra submitted that regulatory risk creates uncertainty which affects investors' confidence and increases the rate of return requirements.[437]

We have set out above the risks we consider should be compensated through the rate of return (see section B.1). We are concerned with establishing the required rate of return from an investor's perspective and ensuring that the expected return under regulation compensates investors (in expectation) for their required return. Investors routinely use the CAPM to estimate the required rate of return. Using the CAPM provides investors with certainty surrounding the estimate of the return on equity. For these reasons we consider that the use of the required return on equity (under CAPM for the benchmark efficient entity's equity) in conjunction with the YTM on debt (i.e. promised yield on the benchmark efficient entity's debt) should adequately compensate all regulated firms for their overall cost of capital.

## Interpretation of 'similar risks'

APA Group submitted that 'the application of … models must be grounded in the circumstances of the service provider, albeit the circumstances of the efficient service provider. If the application of those models were not to be grounded in those circumstances, the requirements of the revenue and pricing principles of the NEL and NGL would not be satisfied'.[438]

APIA suggests that 'firms which face the same consequences in the same state of the world have, by definition, a similar risk profile'.[439]

In relation to the question of what is deemed to be material, the Financial Investors Group suggests that materiality should be consistently interpreted across all aspects of a determination. It submits that the AER should be guided by investors' interpretation of materiality as it applies to underlying assets, within an accounting framework. In the context of impacts on revenue, it suggested that a 0.5–1.0 per cent impact on total revenue would be material. Based on an interpretation of Victorian gas businesses being typical regulated businesses, it translated this to mean that an increase in the WACC of 7 to 13 basis points would be material.[440]

We consider that the use of "similar degree of risk" rather than "same degree of risk" suggests that the benchmark should not reflect the specific circumstances of the individual service provider subject to a determination. Instead, only material differences in the risk between the particular service provider and the benchmark should result in different rates of return. The key consideration for defining a benchmark efficient entity in the guidelines, therefore, is whether there is evidence of a material difference in the degree of risk between sectors and between individual service providers.

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[434]   ActewAGL, *Response to the consultation paper*, June 2013, p. 3.
[435]   APA Group, *Submission to the consultation paper*, June 2013, pp. 2-4; APIA, *Response to the consultation paper*, June 2013, p. 20.
[436]   APA Group, *Submission to the consultation paper*, June 2013, pp. 2-4.
[437]   Envestra, *Submission to the consultation paper*, June 2013, p. 10.
[438]   APA Group, *Submission to the consultation paper*, June 2013, pp. 4-5.
[439]   APIA, *Response to the consultation paper*, June 2013, p. 21.
[440]   FIG, *Response to the consultation paper*, June 2013, p. 22.

In relation to this, we do not consider that it is reasonable or practical to specify a particular basis point spread or percentage of revenue impact as the basis for determining a material difference.

In the absence of empirical evidence, we have considered whether ratings agencies distinguish between gas transmission, gas distribution, electricity transmission and electricity distribution. As the same ratings methodology is applied to all businesses it appears that the ratings agencies do not materially differentiate between the service providers.[441]

## Contemplation of different benchmarks for gas and electricity businesses

In contemplating whether more than one benchmark is required, CitiPower, Powercor and SA Power Networks submitted that a single benchmark covering all energy networks is sufficient as it considers that 'there is likely to be a high degree of commonality between most gas and electricity network businesses and between distribution and transmission, in terms of the risks faced in supplying regulated services. To the extent that a particular business considers that it displays risk characteristics that are materially different to the benchmark, the onus should be on that business to demonstrate this'.[442]

In contrast, other submissions stated that electricity and gas businesses are exposed to different risks and that the gas sector is exposed to higher risk than the electricity sector.[443] APIA submitted that accordingly financial and capital markets do not view investments in gas and electricity supply infrastructure as interchangeable.[444]

Service providers submitted that the factors underpinning their assessment of a higher risk exposure for the gas sector are:

- The type of end user / customer.[445] Service providers state that there is a different composition of end users for gas businesses compared with electricity users. Gas businesses have a higher proportion of large industrial users (mining and manufacturing (50 per cent of total gas use) and electricity generation (30 per cent of total gas use)) compared with electricity businesses[446] (where residential and commercial use accounts for 58 per cent). The risk exposure of the few large end users is transferred to the gas business. Service providers argue that electricity businesses have a more even sectoral exposure. APIA submits that the concentration of end users is greater for transmission service providers than distribution service providers, hence transmission faces a higher risk exposure than distribution service providers.[447]

- The level of competition to which a service provider is exposed.[448] Service providers state that gas is a discretionary fuel and hence has a lower uptake rate than electricity.[449] APIA submits that the electricity sector faces a constant wholesale price across all consumers, set via the NEM. It submits that in contrast gas wholesale price varies across states and basins over time, changing

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441   For example, see Moody's, *Rating Methodology: Regulated Electric and Gas Networks*, August 2009, <https://www.moodys.com/researchdocumentcontentpage.aspx?docid=PBC_118786> accessed 31 July 2013.
442   Citipower, Powercor and SA Power, *Response to the consultation paper*, June 2013, p. 4.
443   Envestra, *Submission to the consultation paper*, June 2013, p. 10; APIA, *Response to the consultation paper*, June 2013, pp. 20-21; Jemena, *Submission to the issues paper*, February 2013, p. 23.
444   APIA, *Response to the issues paper*, February 2013, Schedule 3, p. 1.
445   Envestra, *Submission to the consultation paper*, June 2013, p. 10; APIA, *Response to the issues paper*, February 2013, Schedule 3, p. 1;
446   APIA point to 58 per cent of total electricity demand being residential and commercial users, compared with 17 per cent for gas. APIA, *Response to the issues paper*, February 2013, Schedule 3, p. 1.
447   APIA, *Response to the issues paper*, February 2013, Schedule 3, p. 1.
448   Envestra, *Submission to the consultation paper*, June 2013, p. 10; APIA, *Response to the issues paper*, February 2013, Schedule 3, p. 1.
449   Envestra also raised this. Envestra, *Submission to the consultation paper*, June 2013, p. 10.

the price relativity compared with electricity. It submits that this leads to increased competition in relation to large industrial users where gas is a large proportion of overall costs.[450]

▪ The drivers of investment. Service providers state that investment in gas transmission is driven by the user entering into a direct contract with the gas business.[451] They submit that users will only enter into contracts where they are able to recover their investment within the required time frame. They state that gas transmission businesses are required to write into contracts revenue requirements such that the NGR NPV-positive rule is met. In contrast, they submit that there is no direct contracting between users and electricity transmission businesses and that there is not a revenue requirement for electricity, as there is for gas. They state that gas transmission is more risky than gas distribution because transmission investment typically consists of lumpy, large projects, while distribution projects tend to be more even and smaller, taking the form of extensions to new subdivisions, driven by population growth.

APIA submits that gas transmission has more risk because transmission has a higher share of fixed costs, leaving it more exposed to regulatory risk, with the WACC calculation becoming more important.[452]

As discussed above (see section 3.3.2), we consider that while there may be some differences in risk between gas and electricity businesses that are driven by differences in the type of end user/ consumer and in the level of competition to which businesses are exposed, the regulatory regime, which operates similarly for gas and electricity, mitigates these risks. We conclude that on the basis of the evidence available to it, there are not dissimilar risks between the businesses.

We consider that by virtue of gas service providers entering into contracts with end users, which underwrite the revenue requirement for the asset, that the risk associated with the investment in the asset (i.e. the required return on the assets) is reduced. We accept the risks associated with large lumpy projects, versus small frequent projects, potentially increases cash flow volatility. However, as discussed in relation to demand risk (see section 3.3.2) the regulatory regime addresses this volatility through a revenue or price cap and much of this risk may also be diversifiable in nature. Where there is a demonstrable risk of stranding there may be prudent discount and accelerated depreciation provisions available to the business. For these reasons we conclude that on the basis of the evidence available to us, there is not dissimilar risk associated with there being different drivers of investment between the businesses.

In relation to APIA's point regarding higher fixed costs leading to higher risk for transmission businesses, we consider that the regulatory regime mitigates this risk by allowing for changes in tariff structure, whereby service providers will match their fixed to variable cost ratio to a commensurate fixed (supply) charge to variable (consumption) charge tariff.

We note that in relation to APA GasNet, a gas transmission business, Australia Ratings found that 'APA GasNet would be considered to be either on par or above average on the key Business Risk Profile factors compared with most of its Australian network peers' and assessed that Standard and Poor's would be likely to rate it 'as having an 'Excellent" Business Profile'.[453]

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[450]   APIA, *Response to the issues paper*, February 2013, Schedule 3, p. 1.
[451]   APIA, *Response to the issues paper*, February 2013, Schedule 3, p. 1.
[452]   APIA, *Response to the issues paper*, February 2013, Schedule 3, p. 1.
[453]   Australia Ratings, *Assessment of Implied Credit Rating Arising from the Australian Energy Regulator's Draft Decision on Access Arrangements for APA GasNet Australia (Operations) Pty Ltd for 2013-17*, November 2012, p. 18. Australia Ratings scored APA GasNet on par with Australian network peers on regulation, markets, operations and competitiveness categories and above average on profitability.

## Elements of the benchmark definition

CitiPower, Powercor and SA Power Networks support the inclusion of "pure play" as a characteristic of the benchmark efficient entity on the basis that the rate of return objective focuses on a similar degree of risk in providing reference services and not on a diversified group of services. It also submits that this is consistent with the finance principle that the appropriate discount rate for a project should be based on the risks of the project and not on the risks of the overall firm undertaking the project.[454]

APIA questions the use of regulated firms for the estimation of an efficient benchmark. It submits that by using a regulated firm as the benchmark we are likely to be compensating firms for inefficient practices that would not be viable in a competitive marketplace. It further states that if we use data from regulated firms to estimate the benchmark parameters of equity and debt then 'the AER believes that, collectively, the energy firms which it regulates have information about efficient financing costs that they do not possess individually'.[455]

We consider that in efficient capital markets, all firms operate on the capital frontier. All firms should be priced efficiently and able to access capital at the cost associated with the risks they face that are priced by investors (e.g. under CAPM this would be the systematic risk as measured by the CAPM beta associated with their business operations). Outperformance or underperformance relative to the frontier is reflective of firm specific factors which are not of concern to the regulator as these are not priced in capital markets and do not require ex-ante investor compensation. We note that we compensate transaction costs according to the size of the firm so as not to bias firms towards larger firm structures due to economies of scale that may be associated with raising capital.

In relation to parent ownership, the EUAA's submission supported the inclusion of parent company ownership in the definition of the benchmark efficient entity. This was on the basis that it would 'better account for debt and equity raising costs, and the ability to manage and diversify financial risks, for most privately owned NSPs'.[456]

However, APIA submits that "we are confused by the requirement that the BEE be a business that operates with parental ownership. The AER has not provided any evidence to suggest that firms that operate with parental ownership are more efficient than those which operate without it. Absent of such evidence, we believe that the AER exceeds its mandate with this requirement, by favouring particular business structures for regulated utilities, and engaging in quasi-industry policy, rather than regulation".[457]

QTC and CitiPower, Powercor and SA Power Networks stated that the rate of return for a group's average asset risk may not be equal to the sum of the returns required for each individual asset.[458]

In its submissions, APIA and SP AusNet raised concerns regarding the AER favouring particular business structures.[459] SP AusNet submitted that it no longer has a majority shareholder and so questioned whether it would be deemed to have parent ownership. It stated that it could 'incentivise particular industry and corporate structures which may not be efficient' or it could 'penalise businesses

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[454] CitiPower, Powercor and SA Power Networks, *Response to the AER's Rate of Return Guidelines Consultation Paper*, 28 June 2013, p. 4.
[455] APIA, *Response to the consultation paper*, June 2013, pp. 21–22.
[456] EUAA, Response *to the consultation paper*, February 2013, p. 6.
[457] APIA, *Response to the consultation paper*, June 2013, pp. 21–22.
[458] QTC, *Submission to the issues paper*, February 2013, pp. 8–9; Citipower, Powercor and SA Power, *Response to the issues paper*, February 2013, p. 8.
[459] APIA, *Response to the consultation paper*, June 2013, footnote 14, p. 21.

without, or that do not receive a benefit from, parental ownership, despite it not being clear that parental ownership in itself is desirable'.[460] It further argued that ownership structure is mostly outside the control of regulated service providers.[461]

As indicated above (see section 3.3.4) we acknowledge that parent ownership should not alter the systematic risk of the regulated business itself. We considered whether there is a particular ownership structure which promotes, or is consistent with, efficient financing and investment decisions for the regulated energy benchmark business. We consider that we is unable to specify a particular ownership structure which would ensure efficient outcomes and so has chosen to stay silent on ownership structure in the definition of the benchmark efficient entity. However, we note that a parent with the same (average) level of systematic risk as a regulated business it owns will have the same required return under a pricing model that assumes full portfolio diversification (e.g. the CAPM). This is because the regulated business' exposure to systematic risk is, by definition, not diversifiable.

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[460]  SP AusNet, *Submission to the consultation paper*, June 2013, p. 6.
[461]  SP AusNet, *Submission to the consultation paper*, June 2013, p. 6. SP AusNet also raised that specification of parent ownership in the benchmark firm definition would have implications for gamma/the value of imputation credits. It asserted that parent owners are generally domiciled outside of Australia which would reduce the ability of shareholders to use imputation credits. The AER does not agree with this assertion as the NER, and NGL requires consideration of cash flows for an Australian tax paying company. Furthermore, gamma is specified at an economy level, rather than a firm specific level, due to the difficulties in estimating it, hence the domicile of specific firms is not considered relevant.

# C Gearing

Gearing is defined as the ratio of the value of debt to total capital (i.e. debt and equity), and is used to weight the return on debt and return on equity when formulating a WACC. A business' gearing, also referred to as its capital structure, may have a bearing on the expected required return on debt and the expected required return on equity.

In theory, the optimal debt–equity ratio is the point at which firm value is maximized, where the marginal benefits just offset the marginal costs of debt.[462] However, while an optimal capital structure theoretically exists, the actual optimal value of debt and equity for any given firm is dynamic and dependent on a number of business specific factors.

The benchmark gearing level is used:

- to weight the expected required return on debt and equity to derive the WACC

- to re-lever asset betas for the purposes of comparing the levels of systematic risk across businesses

- to be a factor in determining a credit rating for deriving the return on debt.

The equity beta and credit rating are discussed in appendix G and chapter 7, respectively.

In our 2009 WACC review, we determined that there was not a strong reason to depart from the adopted level of gearing of 60 per cent. This adopted level of gearing was based on prior regulatory practice. We have consistently used this ratio in our determinations since then.

We have relied on a range of quantitative evidence to calculate the gearing of a comparator sample of businesses. We have also compared the results with the previously adopted level of gearing of 60 per cent.

We consider a gearing of 60 per cent for benchmark efficient entity should be maintained given that:

- it is consistent with the proposed benchmark efficient entity definition

- empirical evidence supports a gearing of 60 per cent.

## C.1 Selection of businesses used to derive an industry benchmark

For this guideline, we have adopted the definition of the benchmark efficient entity, which is 'a pure play, regulated energy network business operating within Australia'. Ideally the level of gearing for the benchmark efficient service provider would be taken from a 'pure play' energy network business. However, in Australia, electricity and gas businesses own both regulated and unregulated electricity and gas businesses. Consequently, we consider the sample of comparator businesses used to estimate the level of gearing includes all businesses that operate in the Australian market and have operations which predominantly involve network businesses in the energy sector (including electricity, gas and transmission and distribution businesses). Further, if a business is heavily involved with mergers and acquisition activities, we consider it is appropriate to only include the data up to the point where the business predominantly involved energy network business activities.

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[462] M. Jenson, *Agency Costs of Free Cash Flow, Corporate Finance and Takeovers*, *American Economic Review*, Vol.76, No. 2, 1986, pp. 323–329

Envestra submitted that there is a need to consider empirical evidence, including the costs and risks associated with higher gearing, interrelationship between the return on equity and credit rating and credit rating agencies' expectations for benchmark efficient entity's gearing.[463] We consider that ideally the samples used for the gearing estimation should be consistent with the samples used for estimating equity beta. This is because the benchmark gearing level is used to re-lever asset betas for the purposes of comparing the levels of systematic risk across businesses. Those businesses include:

- Alinta

- AGL

- APA Group

- Diversified Utility and Energy Trusts (DUET)

- Envestra Ltd

- GasNet

- Hasting Diversity Utilities Fund[464]

- SP AusNet

- Spark Infrastructure.

We have undertaken a sensitivity analysis using a sub-sample of businesses, which have a longer time series of gearing data. These include:[465]

- APA Group

- DUET

- Envestra Ltd

- Hasting Diversity Utilities Fund

- SP AusNet

- Spark Infrastructure.

PIAC submitted that the gearing level should be consistent with a benchmark credit rating of BBB+ and with sufficient cash flows being available to the business to continue to invest. The benchmark gearing ratio of 60 per cent is conservative in the sense that it increases the probability that the allowed cost of capital is greater than the actual cost of capital particularly when the entity has parent guarantees. In addition, some submissions also commented that the AER must recognise that the

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[463]    Envestra, *Submission to the consultation paper*, p. 17.
[464]    Hasting is included in this analysis because we consider Hasting as a regulated water network in Australia is the closest comparator available to regulated Australian energy networks. This is supported by Frontier Economics, in its report to the AER, *Assessing risk when determining the appropriate rate of return for regulated energy networks in Australia*, June 2013, p. 4.
[465]    We have excluded AGL, Alinta and GasNet from this sub-sample, given that: AGL was acquired by Alinta in October 2006 and since mainly involved retail energy and generation business; Alinta was acquired by multiple acquires (BNB & SP Consortium) in October 2007; GasNet was acquired by APA in November 2006.

level of gearing and credit rating are closely inter-twined and must be assessed together.[466] We consider that the same sample that is used to determine the benchmark level of gearing could also be used for estimating the benchmark credit rating. Although there may not be a direct relationship between the level of gearing and the credit rating, we consider there may be an indirect relationship. In particular, the proportion of debt used to fund a business' activities may have an impact on the level of interest payments. This would then have an impact on the business' ability to meet financial obligations and affect the credit rating in turn.

However, for regulated utilities, a high gearing does not seem to be a major concern for the rating agencies in determining credit rating. As explained in its rating methodology for regulated electricity and gas, Moody's stated:[467]

> … Moody's would therefore see regulated electric and gas networks as exhibiting relatively low business risk, which can in turn translate into a significant capacity to sustain high debt levels. In addition, the high level of future visibility typically associated with the business model of a regulated network can make very long-term debt financing an attractive proposition to leverage shareholder returns.

This is also consistent with Standard and Poor's rating method, as stated by Australian Rating as below:[468]

> S&P does consider balance sheet leverage, or gearing, as part of its rating of network utilities, however such balance sheet leverage is not typically considered as important for a network utility's financial risk profile as the cashflow metrics described above under 'Cashflow Adequacy':

> Tightly regulated transmission and distribution utilities generally face limited business risk—this translates into stable revenues. As a result, they can operate with... high leverage.

## C.2    Summary estimates of gearing

Most empirical evidence supports a gearing of 60 per cent. Average gearing levels from the 2009 WACC review are presented in Table C.3, as are the Bloomberg market valuations using the most recent data. We observed that the average level of gearing across the three different analyses has a range of 59 to 63 per cent.

**Table C.3    Average gearing levels**

| Year | 2009 WACC review 2002–2007[a] | Bloomberg (market) 2002–2012[b] | Bloomberg (market) 2002–2012 (excluded)[c] |
|------|-------------------------------|----------------------------------|---------------------------------------------|
| 2002 | 65.1 | 54.5 | 65.8 |
| 2003 | 64.8 | 51.8 | 60.5 |
| 2004 | 61.7 | 51.2 | 55.1 |
| 2005 | 64.6 | 51.2 | 62.6 |

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[466] Envestra, *Submission to the consultation paper*, p. 17; PIAC, *Submission to the consultation paper*, p 32; APIA, *Submission to the consultation paper*, pp. 35–36; MEU, *Submission to the consultation paper*, p. 46.
[467] Moody's, *Rating methodology for regulated electricity and gas networks, appendix E*, August 2009, p. 40.
[468] Australia Ratings, *Assessment of implied credit ratings arising from the Australian Energy Regulator's draft decision on access arrangements for APA GasNet Australia (Operations) Pty Ltd for 2013–17*, November 2012, p. 21.

| | | | |
|---|---|---|---|
| 2006 | 63.0 | 56.6 | 61.9 |
| 2007 | 60.5 | 57.6 | 57.6 |
| 2008 | n/a | 68.3 | 68.3 |
| 2009 | n/a | 68.8 | 68.8 |
| 2010 | n/a | 65.5 | 65.5 |
| 2011 | n/a | 63.2 | 63.2 |
| 2012 | n/a | 60.6 | 60.6 |
| Average | 63.3 | 59.0 | 63.1 |

Source: AER analysis.
Notes: (a): AER, *Final decision: Electricity transmission and distribution network service providers: Review of the weighted average cost of capital (WACC) parameters*, 1 May 2009, p. 124; (b): analysis including full sample of businesses; (c): AGL, Alinta and GasNet excluded from the analysis.

The ENA also supported a benchmark efficient firm with a gearing of 60 per cent, and submitted that this is consistent with the range of the gearing estimates used by SFG in its analysis of the five currently listed Australian entities with regulated energy assets plus HDF (which was recently acquired by APA).[469]

We will update the analysis for the final guideline to include the latest gearing data. At this time we propose to maintain the currently adopted benchmark efficient level of gearing of 60 per cent.

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[469]  ENA, *Submission to the consultation paper*, 28 June 2013, p. 94.

# D    Return on equity: term

This appendix discusses our proposed term of the return on equity.

## D.1    Proposed approach

There are reasonable arguments to support either a 10 year term or a five year term for the return on equity. The case for a 10 year term emphasises the long term nature of cash flows in equity investment, in general, and the long lived nature of the assets in an infrastructure business (such as electricity and gas service providers), in particular. The case for a five year term emphasises the similarity in the cash flows between a regulated electricity or gas service provider subject to five year regulatory control periods and the cash flows of a five year bond with annual coupon payments.

Further, the opinion of experts and of stakeholders on this matter are mixed. As is outlined in this appendix, some experts and stakeholders support a 10 year term while others support a five year term.

In this draft guideline, we have adopted a 10 year term for the return on equity. This is because:

- On balance, we are more persuaded by the arguments for a 10 year term, than the arguments for a five year term.

- We have adopted a 10 year term in past decisions.[470] Maintaining our previous position, in the absence of good reasons for change, promotes certainty and predictability in decision making.

- Maintaining a 10 year term avoids some practical complexities in the estimation of certain return on equity parameters (specifically, the market risk premium (MRP)) that would result from a change from a 10 year to five year term.

- The difference in the overall rate of return between a 10 year and five year return on equity is unlikely to be material.

For the above reasons, maintaining a 10 year term for the return on equity promotes the allowed rate of return objective.

## D.2    Background

The Australian Competition Tribunal (the Tribunal) decided in its 2003 GasNet decision that 10 years is the appropriate term of the risk free rate in the CAPM.[471] The Tribunal came to this view on the basis of two reasons:

- as the MRP was estimated using a 10 year risk free rate, consistency demands that a 10 year risk free rate be used in the CAPM, and

- it is a convention of economists and regulators to use a relatively long-term risk free rate where the life of the assets is relatively long.

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[470]    See for example: AER, *Access arrangement final decision APA GasNet Australia (Operations) Pty Ltd 2013-17 attachment*, March 2013, p. 54.

[471]    Australian Competition Tribunal, *Application by GasNet Australia (Operations) Pty Ltd [2003] ACompT 6*, 23 December 2003.

In the consultation paper, we said that different terms may be appropriate for equity and debt. The consultation paper drew attention to a recent paper by Associate Professor Lally which supports a term of equity that matches the regulatory control period.[472] We sought submissions from stakeholders on the appropriate term of equity in the consultation paper.

The submissions from consumer groups were mixed. On the one hand, the Major Energy Users (MEU) accepted Lally's arguments for a term which matches the regulatory control period.[473] On the other hand, Public Interest Advocacy Centre (PIAC) suggested that there are arguments for both a five year and a 10 year term, and so suggested practical questions may decide the issue.[474]

In their submissions on the consultation paper, service providers uniformly supported a 10 year term. The ENA's consultancy report, by Incenta, provides a reply to Lally's argument for a five year term.[475]

## D.3    Reasons supporting a 10 year term

The central argument for using a long term rate in the return on equity is that equity in an ongoing infrastructure business can be expected to generate regular cash flows into the long term, and potentially into perpetuity.

In their submissions, service providers emphasised that infrastructure businesses own long lived assets.[476] Thus the cash flows from these assets will be generated at regular intervals over the lives of those assets. The term of the return on equity should match the long life of those cash flows and assets.

More generally, in applying the CAPM, practitioners assume that the equity investment for an ongoing business is long term. This is because it generates a potentially infinite stream of cash-flows.[477] Pratt and Grabowski (2010) and Damodaran (2008) both propose that, in general, an equity investment in an ongoing business is long term.[478] They suggest, therefore, that for an ongoing business, the term of the equity should be measured as the duration of the long-term—and potentially infinite—series of cash flows. Both conclude that it is appropriate to use long term government bonds to estimate the return on equity, with Damodaran suggesting that 10 years is generally appropriate.[479] In practice, the 10 year rate also tends to be used in valuations. The KPMG Valuation Practices Survey 2013 reports

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[472]    Martin Lally, *The risk free rate and the present value principle*, August 2012.

[473]    Major Energy Users (MEU), *Response to the AER's rate of return guidelines consultation paper*, June 2013, pp. 17-19.

[474]    Public Advocacy Centre Ltd (PIAC), *Submission to the AER's rate of return guidelines consultation paper*, 21 June 2013, pp. 13-14.

[475]    ENA, *Response to the AER's rate of return guidelines consultation paper, Attachment 14: Updated dividend drop-off estimate of theta, INCENTA*, 28 June 2013, pp. 26-27.

[476]    See, for example, APIA, *Submission to the Australian Energy Regulator's Rate of Return Guidelines May Consultation Paper*, June 2013, p. 27; Incenta Economic Consulting, *Report for the Energy Networks Association: Term of the risk free rate for the cost of equity*, June, 2013, p. 20.

[477]    For a description of the valuation methods of practitioners, see Shannon Pratt and Roger Grabowski, *Cost of Capital: Applications and Examples*, 4th ed. (Hoboken: Wiley, 2010), p. 120

[478]    Shannon Pratt and Roger Grabowski, *Cost of Capital: Applications and Examples*, 4th ed. Hoboken: Wiley, 2010, pp. 118–120; Aswath Damodaran, *'What is the risk free rate? A search for the basic building block'*, December 2008, pp. 9-10, downloaded from http://pages.stern.nyu.edu/~adamodar/ on 27 June, 2013.

[479]    These authors address the question of how the term of an equity holding in an on-going business should be estimated if it can be expected to generate regular cash flows annually for, say, 100 years or potentially into perpetuity. Pratt and Grabowski (2010, pp. 118-20) and Damodaran (2008, pp. 9–10) have proposed that the term can be estimated as the 'duration' of that series of cash-flows. Note that even if the duration turned out to be significantly more than 10 years—say 20 or 30 years—it would still be appropriate to use a 10 year risk free rate in the CAPM because (i) there are practical problems with obtaining data on 20 or 30 year government bonds (ii) the premium for 10 years tends to be similar to the premium for 30 years (Damodaran, 2008, pp. 9–10).

that 'Eighty five per cent of participants use the yield of the 10 year government bond as a proxy for the risk free rate in Australia'.[480]

## D.4    Reasons supporting a five year term

In Lally (2012), the argument for a five year term relies on the 'present value principle'—the principle that the net present value (NPV) of cash flows should equal the purchase price of the investment. Lally stated that the present value principle is approximately satisfied only if the term of equity matches the regulatory control period.

Lally illustrated this point using a numerical example in which there is no risk, so the return on equity equals the risk free rate. The example sets allowed revenues at the beginning of the regulatory control period using the yield to maturity on a five year risk free bond.[481] Lally showed that in this example, the 'present value principle' is approximately satisfied: the NPV of the cash flows is approximately equal to the book value of the assets. The reason why the principle is satisfied is that the structure of the bond payments and the structure of the regulatory payments are similar—in particular, 'the durations for the five year bond and the regulatory payoffs are very similar'.[482] The duration of the bond payments is 4.34 years, while the duration of the regulatory payments is 4.47 years. The core intuition behind the argument for a five year term is that the cash flows from the building block model have a similar structure to the cash flows from a five year bond. Put simply, the argument is that an equity investment in a regulated business is—at least in respect of its term—like an investment in a five year bond.

The central issue in the debate about the term of equity, therefore, is the extent to which the cash flows from an equity investment in a regulated business are like the cash flows from a five year bond.

## D.5    Reasons against a five year term

In Lally's calculation above, the cash flow in each year is the allowed revenue net of opex and capex, except in the final year, where the closing value of the regulatory asset base (RAB) is included in the cash flow.[483] That is, the assumption is that the investor receives a cash payment equal to the RAB in the final year of the regulatory control period. While under certain assumptions, the market value of equity is equal to the residual value of the RAB, these assumptions may not hold in reality. In the report submitted by the ENA, Incenta put this point as follows:[484]

> …investors are unlikely to evaluate regulated assets with reference to a 5 year bond because – unlike the case of the bond – the residual value at the end of each 5 year period is inherently risky. This is because the residual value is not returned in cash, but rather comprises a 'value' whose recovery remains at risk from future regulatory decisions and changes in the market (both technological changes and changes to customer preferences).

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[480]    KPMG, *Valuation Practices Survey 2013*, p. 12.
[481]    Lally, *Risk free rate and present value*, August 2012, pp. 13-16.
[482]    Lally, *Risk free rate and present value*, August 2012, p. 15
[483]    Lally's NPV calculation is presented below. The figure of $100m in the fifth cash payment is the closing value of the RAB:

$$V_0 = \frac{\$5.93m}{1.05} + \frac{\$5.93m}{(1.0525)^2} + \frac{\$5.93m}{(1.055)^3} + \frac{\$5.93m}{(1.0575)^4} + \frac{\$5.93m + \$100m}{(1.06)^5} = \$99.93m$$

[484]    ENA, *Response, Attachment 14: Updated dividend drop-off estimate of theta, INCENTA*, June 2013, p. 7.

Incenta noted that it was, in effect, reiterating the argument made by Officer and Bishop in a 2008 consultancy report. Officer and Bishop said that the argument for a five year term would be correct only if after five years, in the event that 'they [the owners of the regulated business] choose to walk away from the asset, they would be fully compensated'. Officer and Bishop propose, however, that the owners are not, in reality, guaranteed of such compensation—the problem is that there is no guarantee that the secondary market will deliver a price equal to the value of the equity component of the RAB.[485]

## D.6 Additional considerations

There are compelling arguments both that (i) there are respects in which regulated equity is like five year debt and (ii) there are respects in which regulated equity is different to five year debt. The question arises of how to weigh up these conflicting considerations. The following additional considerations support not adopting a five year term.

First, Incenta presented the results of a survey of market practitioners which asks them whether they use a 10 year or a five year rate for valuing regulated equity. In this survey, 12 practitioners and two independent experts were asked specifically about 'the term of the risk free rate in a CAPM valuation of regulated infrastructure assets with a five year regulatory cycle'. All of those surveyed stated they used a 10 year rate.[486]

Second, Incenta observed that a move to a five year term for equity would have implications for our estimates of the MRP. For example, the evidence relating to historical estimates of the MRP have been calculated using a 10 year risk free rate. If we were to move to a five year term, this historical average may need to be recalculated (or approximated) using a five year risk free rate. The data we currently use to calculate historical averages of the MRP covers a significantly longer period than the data available for the five year risk free rate (which only extends back to the 1970s).

Third, there is also a question about the materiality of the change in the term of equity. On average, the yields on 10 year commonwealth government securities (CGS) are approximately 20 basis points higher than the five year CGS rate. Further, the benchmark level of gearing adopted in this draft guideline is 60 per cent debt to 40 per cent equity. Therefore, if we were to move to a five year term on the return on equity (and if the MRP were unchanged), on average the WACC would be expected to fall by only 40 per cent of 20 basis points. That is, on average, the WACC would fall by only 8 basis points. Moreover, if the MRP were adjusted upwards (as a result of a change to a five year term), the fall in the average WACC would be less than 8 basis points. Or potentially, the average WACC may increase slightly depending on the extent the MRP is adjusted. Therefore, a shift to a five year term appears likely to have limited impact.

Fourth, there is reason to think that, in general, long term government bond rates may generate a more stable return on equity than shorter term bond rates. Incenta found that if (i) a five year rate is used and (ii) the MRP is not adjusted, then 'the change will increase the volatility of the regulatory cost of capital'.[487]

While we note that there are compelling arguments both for a five year term and a 10 year term, on balance, we propose to maintain a 10 year term.

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[485]  VAA, *Term of the Risk-Free Rate – Commentary: Prepared for Energy Networks Association, Australian Pipelines Association and Grid Australia*, September 2008, p. 19.

[486]  ENA, *Response, Attachment 14: Updated dividend drop-off estimate of theta, INCENTA*, June 2013, pp. 26-27.

[487]  ENA, *Response, Attachment 14: Updated dividend drop-off estimate of theta, INCENTA*, June 2013, p. 7.

# E Return on equity: assessment of models against criteria

This appendix details the strengths and limitations of the return on equity models outlined in chapter 5, against the criteria set out in chapter 2. Our assessments have drawn on a range of consultant reports commissioned by us and stakeholders, and submissions received during the development of these guidelines.[488] This appendix, however, does not contain a detailed description of the construction of these models. Instead, interested stakeholders should refer to appendix E of our consultation paper.

## E.1 Sharpe–Lintner CAPM

This section contains our assessment of the Sharpe–Lintner CAPM against our criteria. We consider that the model meets most of the criteria.

The Sharpe–Lintner CAPM relies on the well–accepted finance principle that rational investors will seek to minimise their risk (as measured by the variance of portfolio returns) for a given return, or alternatively will seek to maximise expected returns for a given level of risk (variance).[489] The model was developed to forecast the required return on an individual asset (or portfolio).[490] Therefore, the model is fit for the purpose of forecasting the required return for the benchmark efficient entity.

The Sharpe–Lintner CAPM requires the estimation of three parameters—the risk free rate, the market risk premium (or the return on the market portfolio over the risk free rate) and the equity beta. The estimation of these parameters is less complex than the estimation of parameter inputs for most other return on equity models, and is supported by robust and replicable analysis. For example:

- Estimation of the risk free rate in our previous decisions has relied on yields on Commonwealth government securities.[491] These yields are published by the Reserve Bank of Australia and so are readily observable and reliable. As such, this approach is relatively simple, transparent and robust.

- Estimation of the market risk premium in our previous decisions has relied on a broad range of evidence, including historical excess market returns, estimates derived from dividend growth models, surveys of market practitioners and other regulator's estimates.[492] To varying degrees, we consider these information sources are robust and replicable, which is why we have relied on them in the past. Given the market risk premium is not as readily observable as the risk free rate, judgment is needed to select a point estimate. Drawing upon a range of information to select a point estimate reduces the risk of error associated with any particular information source. In this way, the market risk premium can be estimated in accordance with good practice.

- Estimation of the equity beta in our previous decisions has been based on regression analysis of publically available stock market returns. This approach incorporates sensitivity analysis to test

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[488] We have only been able to give limited regard to the consultant reports submitted by ENA on the consultation paper because it was submitted late and because of the number and complexity of those reports.

[489] G. Peirson, R. Brown, S. Easton, P. Howard and S. Pinder, *Business Finance*, McGraw-Hill: Ninth edition, 2006, pp. 200–207 (Peirson et al, Business Finance, 9th edition, 2006).

[490] Peirson et al, *Business Finance*, 9th edition, pp. 200–207.

[491] See for example, AER, *Final decision: Access arrangement final decision: APA GasNet Australia (Operations) Pty Ltd 2013-17, Part 2: Attachments*, March 2013 (AER, *Final decision: APA GasNet 2013–17, Part 2: Attachments*, March 2013).

[492] See for example, AER, *Final decision: APA GasNet 2013–17, Part 2: Attachments*, March 2013.

the robustness of our estimates. Further, each step of our approach is documented to promote transparency and to allow these results to be replicated.

The capacity to implement the Sharpe–Lintner CAPM in accordance with good practice is further supported by a report from Professor Stewart Myers, submitted by the APIA. Specifically, Professor Myers stated that the Sharpe–Lintner CAPM is simple and logical, and parameter values can be estimated with tolerable accuracy.[493]

Professor Myers also stated that careful application of the Sharpe–Lintner CAPM tends to give estimates of the return on equity that are sensible and reasonably stable over time.[494] That said, our implementation of the Sharpe–Lintner CAPM has been a contentious issue in recent decisions. In particular, stakeholders submitted that our implementation has led to equity returns that are too variable.[495] Stakeholders also submitted that our implementation demonstrated the model's sensitivity to estimates of the risk free rate and to different estimation procedures for the market risk premium.[496] We consider that these concerns, however, are not limitations of the model, but instead, represent stakeholder concerns over how we previously implemented the model. These issues are important and are discussed in section 5.4.2 (stability in equity returns) and appendix G.

For similar reasons, however, the model can be reasonably flexible so as to allow for changing market conditions. APIA noted that a positive characteristic of the model is its sensitivity to economic conditions through the risk free rate and market performance. On the other hand, APIA considered that there may be a delay incorporating changes in systematic risk because beta estimates rely on historical data.[497] We agree that the risk free rate is sensitive to changes in market conditions. Further, we consider that because estimation of the market risk premium and the equity beta use historical data amongst other information, they are less flexible.

The Sharpe–Lintner CAPM can also be implemented in a way proposed by Professor Stephen Wright.[498] Under the Wright approach, the return on the market portfolio and the risk free rate are estimated separately. More information on this approach can be found in section F.3.1. As demonstrated in that section, the Wright approach results in a significantly more stable return on equity estimate when compared to our standard implementation of the Sharpe–Lintner CAPM. We consider, therefore, this implementation of the model is not as flexible to changing market conditions as our standard implementation.

On the other hand, we consider that implementing the Wright approach is more transparent and replicable than our standard implementation of the Sharpe–Lintner CAPM. As noted, our standard implementation requires the use of some judgment in determining a market risk premium. The Wright approach, however, requires less judgment. The Wright approach assumes that the return on the market is constant and as such, uses only historical data to estimate the return on the market.[499]

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[493]    S. Myers, *Estimating the cost of equity: introduction and overview*, 17 February 2013, pp. 2–3 (Myers, *Estimating the cost of equity*, February 2013), submitted as an appendix to APIA, *Response to issues paper: The AER's development of rate of return guidelines*, 20 February 2013 (APIA, *Response to the issues paper*, February 2013).

[494]    Myers, *Estimating the cost of equity*, February 2013, p. 3.

[495]    For example see APIA, *Submission to the Australian Energy Regulator's rate of return guidelines May consultation paper*, June 2013, p. 29 (APIA, *Response to the consultation paper*, June 2013).

[496]    The Brattle Group*, Estimating the cost of equity for regulated companies: Prepared for the Australian Pipeline Industry Association*, 17 February 2013, p. 18 (Brattle Group, *Estimating the cost of equity*, February 2013); submitted as an appendix to APIA, *Response to the issues paper*, February 2013.

[497]    Brattle Group, *Estimating the cost of equity*, February 2013, p. 18.

[498]    S. Wright, *Response to Professor Lally's analysis*, November 2012.

[499]    S. Wright, *Response to Professor Lally's analysis*, November 2012. A constant return on the market implies there is a negative relationship between the market risk premium and the risk free rate. As discussed more in section F.3.1, we consider there is no consensus in the academic literature on the direction, magnitude or stability of the relationship

The empirical performance of any model is also important in assessing whether it should be used when estimating the return on equity. This is reflected in our assessment criteria, and is supported by submissions from the MEU and PIAC.[500] The Sharpe–Lintner CAPM, in particular, has been the subject of much empirical analysis.[501] The empirical shortcomings of the model are often cited as key drivers for the consideration of alternative specifications of the CAPM.[502] For example, there is evidence that the model systematically under or overestimates expected returns for low and high beta stocks.[503]

Empirical tests of the Sharpe–Lintner CAPM, however, have been criticised for only being tests of whether the market portfolio is mean–variance efficient.[504] Theoretically, the market portfolio used in the estimation of the Sharpe–Lintner CAPM can be defined as the value–weighted combination of all assets. But for practical reasons, the return on a stock market index is typically used as a proxy for the broader market. Criticisms of the Sharpe–Lintner CAPM, therefore, may be a result of common implementations of the model as distinct from theoretical failings. The results of these empirical tests indicate the model may under estimate returns for low beta firms ('low beta bias'). These implementation problems are important, but we consider that they can be overcome or mitigated. For example, using a 10 year term for the risk free rate and using the Black CAPM theory to inform the beta estimate would provide corrections for any possible low beta bias.[505] These implementation issues are discussed further in appendix G and section F.2.2. Notwithstanding these implementation problems, we still consider it is one of the most easily implementable models when compared to others.

To some extent, the empirical concerns that exist with the Sharpe–Lintner CAPM are also balanced by the preference for the model by academics, market practitioners and regulators. McKenzie and Partington, for example, stated that the model is without doubt the most widely used model for estimating the return on equity in regulated companies.[506] The model's widespread use further demonstrates its fitness for the purpose of estimating returns on equity.

We consider that the Sharpe–Lintner CAPM's attributes including its strong theoretical support, widespread use and that it can be easily implemented, means that we propose it play an important role as our foundation model in estimating the return on equity. The reasons for why we propose our standard implementation of Sharpe–Lintner CAPM to play this role are outlined in sections F.1.1 and F.3.1. Section F.3.1 outlines why we propose the use the Wright approach to inform our estimates of the return on equity.

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between the risk free rate and the market risk premium. Wright acknowledges that assuming the cost of equity is constant necessarily implies that the market risk premium moves inversely to the risk free rate (point for point).

[500]  For example, the MEU stated that theories must be proven to replicate real world outcomes before they should be given credence. Similarly, PIAC submitted that the reasonableness of the outputs of the models with respect to the allowed rate of return objective should first be tested against real world market data. MEU, *Response to the AER's rate of return guidelines issues paper,* February 2013, p. 23; PIAC, *Submission to the AER's rate of return guidelines issues paper*, February 2013, p. 24.

[501]  For example, see the summary provided by, APIA, *Response to the consultation paper*, June 2013, appendix pp. 44–45.

[502]  For example, see M. McKenzie, and G. Partington, *Report to the AER: Risk, asset pricing models and the WACC*, 27 June 2013, p. 24 (McKenzie and Partington, *Risk, asset pricing and WACC*, June 2013); and APIA, *Submission to the Australian Energy Regulators consultation paper*, June 2013, appendix pp. 45–57.

[503]  Myers, *Estimating the cost of equity*, February 2013, p. 3; and Brattle Group, *Estimating the cost of equity*, February 2013, p. 18.

[504]  A portfolio can be considered mean–variance efficient if it provides the highest return relative to a given level of risk.

[505]  AER, *Final decision: Envestra Ltd Access arrangement proposal for the Qld gas network 1 July 2011 – 30 June 2016*, June 2011, p. 158 (AER, *Final decision: Envestra access arrangement Qld*, June 2011).

[506]  McKenzie, and Partington, *Risk, asset pricing and WACC*, 27 June 2013. p. 22.

## E.2    Dividend growth models

This section contains our assessment of the dividend growth model against our criteria. We consider that the model meets some of the criteria.

Dividend growth model estimates can be determined using single or multiple stage models. Single stage dividend growth models may estimate the return on equity as the sum of the expected dividend in the next period over the current price, and a constant expected growth rate of dividends.[507] In contrast, multiple stage models relax the assumption of a constant expected growth rate of dividends. Instead, multiple stage models adopt a number of assumptions regarding the stream of future dividends. A three–stage dividend growth model, for example, requires assumptions regarding the expected growth rate of dividends in three periods. The first period typically incorporates analyst forecasts, while the final period typically assumes constant real growth in perpetuity. The middle period, therefore, transitions the expected growth rate from the level forecast by analysts to the constant growth rate assumed in the final period.[508]

Given both single and multiple stage dividend growth models do not require econometric analysis, we consider the implementation of either approach is relatively simple. Moreover, the underlying financial theory of the model—that the price of an asset should be equal to the present value of the expected future cash flows from that asset—is well accepted and sound.[509]

The determination of robust and transparent dividend growth model estimates, however, is predicated on the reliability and breadth of the available input data. As outlined previously, the estimation of dividend growth models requires assumptions about dividend yields, as well as the expected growth rate of dividends. For estimates of dividend yields in the Australian market, a sufficiently robust data series exists.[510] Additionally, methods for estimating the growth rate of dividends in the Australian market have been developed.[511]

In contrast, we do not consider that the same level of data exists to form robust dividend yield estimates for Australian energy service providers. For example, there are only five sample Australian service providers for which dividend yield data is available.[512] Further, the time series for when these estimates are available is both variable and short.[513] It is also unclear whether a robust method for estimating the growth rate of dividends for service providers has been developed. Of further concern is that the dividend growth model is sensitive to the particular assumptions used. This is particularly relevant for the long term growth rate assumption.[514]

These implementation issues can be demonstrated using a simplistic version of the dividend growth model—the constant growth model. A worked example of this simplistic model is available in appendix H. In brief, however, the example shows that these data limitations can produce return on equity estimates for regulated service providers that are higher than returns to the market. We consider such outcomes are implausible given the lower risk profile of service providers.

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[507]    McKenzie, and Partington, *Risk, asset pricing and WACC*, June 2013, pp. 35–36.

[508]    For further discussion of DGM models, see: AER, *Final decision, Access arrangement final decision: SPI Networks (Gas) Pty Ltd, 2013-17, Part 2*, March 2013, pp. 101–103.

[509]    R. Brealey, S. Myers, and F. Allen, *Principles of Corporate Finance: Tenth edition*, 2011, p. 82.

[510]    For example, dividend yields for the ASX200 are readily available.

[511]    For example, M. Lally, *The dividend growth model*, 4 March 2013; CEG, *Response to AER Vic gas draft decisions internal consistency of MRP and risk free rate*, November 2012; and CEG, *Update to March 2012 report: On consistency of the risk free rate and MRP in the CAPM*, November 2012. Appendix H outlines the dividend growth model we have used for this draft decision.

[512]    The relevant businesses are the APA Group, DUET, Envestra, Spark Infrastructure and SP AusNet.

[513]    For example, dividend yield estimates for Envestra are available from 2001, and 2006 for Spark Infrastructure.

[514]    The Brattle Group expressed similar concerns about the long term growth rate assumption. Brattle Group, *Estimating the cost of equity*, February 2013, p. 30.

Dividends and prices, that are needed to estimate the return on equity from the dividend growth model, are readily observable in the market.[515] As such, we consider that the model is flexible to reflect changing market conditions. On the other hand, as noted by the Brattle Group, because stock prices (and to a degree forecasted growth rates) change frequently, the model's results often vary substantially over time.[516] This may mean that the model is sensitive to frictions in the market, which could lead to imprecise results.

We consider the limited ability to construct credible datasets for implementing industry specific dividend growth models and the model's sensitivity are fundamental limitation of the model. We further consider that this means we cannot rely on the dividend growth model to estimate the return on equity of service providers. These data limitations, however, are less prevalent in the context of determining robust return on equity estimates for the market more generally. Therefore, we propose to consider dividend growth model estimates when estimating the market risk premium. The reasons for why we propose dividend growth models to play this role are outlined in section F.2.1.

## E.3   Black CAPM

This section contains our assessment of the Black CAPM against our criteria. We consider that the model meets some of the criteria.

The Black CAPM requires the estimation of three parameters—the return on the market portfolio, the return on the zero beta portfolio, and the equity beta.[517] The estimation of the return on the market and zero beta portfolios, however, is complex. Moreover, estimates of the return on equity from the Black CAPM are highly sensitive to these inputs. For example:

- Expected returns on zero beta portfolios are not observable, and no generally accepted empirical measurement of the zero beta portfolio exists.[518] As stated by, McKenzie and Partington 'there is no generally accepted empirical measurement of the zero beta return…because the empirical measurement of the zero beta return is neither simple, nor transparent.'[519] Accordingly, the estimation of returns on a zero beta portfolio typically requires econometric analysis. Such analysis is neither simple nor transparent, and may lead to difficulties in determining robust updates to these estimates at the time of each determination. This also leads to concerns about data mining.

- Estimation of the Black CAPM also requires an exact identification of the market portfolio. As stated by McKenzie and Partington, the estimation of the zero beta return is sensitive to the choice of proxy for the market portfolio and so even a portfolio close to the market may not be sufficient.[520] Instead, the use of a portfolio which is not the market portfolio may lead to parameter estimates that are outside the bounds prescribed by the underlying theoretical model.[521]

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[515]   As discussed , however, there are questions on the robustness of some dividend yield estimates
[516]   The Brattle Group expressed similar concerns about the long term growth rate assumption. Brattle Group, *Estimating the cost of equity*, February 2013, p. 31.
[517]   M. McKenzie and G. Partington, *Report to the AER: Review of NERA report on the Black CAPM*, 24 August 2012, p. 25 (McKenzie and Partington, *Review of NERA report on Black CAPM*, August 2012).
[518]   McKenzie and Partington, *Review of NERA report on Black CAPM*, August 2012, p. 8.
[519]   McKenzie and Partington, *Review of NERA report on Black CAPM*, August 2012, p. 8.
[520]   McKenzie and Partington, *Review of NERA report on Black CAPM*, August 2012, p. 14.
[521]   McKenzie and Partington, *Review of NERA report on Black CAPM*, August 2012, pp. 8, 9, 22.

- NERA, for example, recently submitted an estimate of the return on equity derived from the Black CAPM for which they acknowledged the reference portfolio was not mean–variance efficient.[522] NERA's corresponding return on equity estimate was implausible, insomuch as it implied a negative market risk premium. [523]

We consider NERA's report demonstrates that the estimation of parameters for the Black CAPM is not sufficiently robust such that the model could be implemented in accordance with good practice.[524] Further, the sensitivity of the model to estimates of both the zero beta and market returns (especially given the difficulties in robustly estimating these parameters) represents a fundamental limitation of the model.[525]

Given the abovementioned limitations, it is informative to also consider the use of the model by regulators and academics. To our knowledge, the Black CAPM is not used by other regulators (either domestically or internationally), academics or market practitioners to estimate the return on equity.[526]

A feature of the Black CAPM is that, relative to the Sharpe–Lintner CAPM, the slope of estimated returns is flatter. As a result, the Black CAPM will estimate higher returns than the Sharpe–Lintner CAPM for assets with a beta less than one. Alternatively, for assets with a beta greater than one, the Black CAPM will estimate lower returns than the Sharpe–Lintner CAPM.[527] The empirical support for the Black CAPM, however, is inconclusive. There is evidence both for and against the empirical outperformance of the model over the Sharpe–Lintner CAPM. Further, there is also evidence that indicates both models are relatively poor predictors of returns.[528] Additionally, the difficulties inherent in testing the Sharpe–Lintner CAPM (for example, the misspecification of the market portfolio, as outlined in section E.1) also apply to tests of the Black CAPM.

On the other hand, the Black CAPM relies on the well-accepted economic and finance principle that rational investors will minimise the variance of portfolio returns for a given return, or alternatively maximise expected returns given variance. The Black CAPM also relies on similar fundamental assumptions to the Sharpe–Lintner CAPM, with one major difference. The Sharpe–Lintner CAPM assumes there is unlimited risk free borrowing and lending, a simplification that does not hold in practice. The Black CAPM relaxes this assumption and acknowledges that investors may not be able undertake unlimited borrowing or lending at the risk free rate.[529] However, in its place the Black CAPM assumes that unlimited short selling of stocks is possible with the proceeds available for investment.[530] This assumption does not hold in practice either, and so there are still concerns over the basis for the model and as a result the empirical estimation of the return on the zero beta portfolio.

We consider that the Black CAPM's flexibility to account for changing market conditions is similar to that of the Sharpe–Lintner CAPM. As discussed, however, we consider that the robustness of the parameter estimates, in particular the return on the zero beta portfolio, is poor.

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[522]   NERA, *The Black CAPM: A report for APA Group, Envestra, Multinet & SP AusNet*, March 2012, pp. 12–13, 18–19. Mean variance efficient means that investors choose a portfolio that minimise the variance of portfolio return given expected return, or maximises expected return given variance.

[523]   McKenzie and Partington, *Review of NERA report on Black CAPM*, August 2012, pp. 24–25.

[524]   This reflects the third of our assessment criteria for the application of regulatory judgement.

[525]   This reflects the third and fourth of our assessment criteria for the application of regulatory judgement.

[526]   AER, *Final decision: Envestra access arrangement Qld*, June 2011, p. 40. AER, *Draft decision Envestra Ltd Access arrangement proposal for the Qld gas network 1 July 2011 – 30 June 2016*, February 2011, p. 63.

[527]   APIA, *Response to the consultation paper*, June 2013, p. 46.

[528]   For discussion see: AER, *Final decision, Envestra Ltd, Access arrangement proposal for the SA gas network, 1 July 2011 – 30 June 2016*, June 2011, pp. 167–175. NERA, *Review of cost of equity models; a report for the Energy Networks Association*, June 2013, pp. 5–19. McKenzie and Partington, *Review of NERA report on Black CAPM*, 24 August 2012.

[529]   McKenzie and Partington, *Risk, asset pricing and WACC*, June 2013. p. 25.

[530]   McKenzie and Partington, *Risk, asset pricing and WACC*, June 2013. p. 25.

The Black CAPM has theoretical strengths, however, there are also significant limitations to implementing the model. On balance, we consider that the particular application of the model will moderate the implementation concerns. Rather than estimating the model directly, we propose to take it into account in determining the Sharpe–Lintner CAPM's beta. There is little prospect of resolving a reliable empirical estimate of the zero beta portfolio return, but the direction of adjustment relative to the standard Sharpe-Lintner CAPM is discernible. The reasons why we propose this role for the Black CAPM are outlined in section F.2.2.

## E.4    Fama–French three factor model

This section contains our assessment of the Fama–French three factor model against our criteria. We consider that the model does not meet most of the criteria.

The Fama–French three factor model was developed based on empirical research of historical stock returns in the United States.[531] In particular, the model sought to expand on the Sharpe–Lintner CAPM to determine estimates of the return on equity that better matched historical data. In addition to the excess return on the market portfolio (over the risk free rate), the model includes two factors to explain the expected return on an asset.[532] These additional factors are:[533]

- the difference between the return on a portfolio of high book–to–market shares and the return on a portfolio of low book–to–market shares (labelled the high-minus-low or HML factor)

- the difference between the return on a portfolio of small capitalisation shares and the return on a portfolio of large capitalisation shares (labelled the small-minus-big or SMB factor).

The HML and SMB factors, however, are not motivated by predictions about what factors should be relevant to investors. Instead, these factors are empirical constructs.[534] As noted by McKenzie and Partington:[535]

> The Fama and French model is therefore solidly rooted in data analysis and, as a consequence, there is no clear theoretical foundation to identify the risk factors, if any, that the model captures.

This contrasts with the variations of the CAPM, which are underpinned by sound economic principles. The lack of economic basis raises a number of key questions, including why HML and SMB factors should be relevant predictors of returns, and whether these factors apply in the Australian context.

Whether the Fama–French three factor model predicts future returns on equity was considered by Fama and French. Specifically, they noted that if the SMB and HML factors are sample specific, then they may not be relevant to estimating the return on equity.[536] In other words, the factors need to be observed systematically for the model to have predictive validity. We have previously observed, however, that these factors vary considerably and do not follow a pattern of systematic observance in

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[531]    See discussion in AER, *Draft decision—Public, Jemena Gas Networks Access arrangement proposal for the NSW gas networks, 1 July 2010 – 30 June 201*5, February 2010, pp. 110–111 (AER, *Draft decision: JGN access arrangement*, February 2010).

[532]    Consequently, the Fama–French model also includes two additional beta parameters (for exposure to HML and SMB, in addition to the 'standard' beta that represents exposure to the market risk premium).

[533]    Peirson et al, *Business Finance,* 9th edition, 2006.

[534]    E. Fama and K. French, 'The Capital Asset Pricing Model: Theory and evidence', *Journal of Economic Perspectives*, 2004, vol. 18(3), p. 41. AER, *Final decision—Public Jemena Gas Networks Access arrangement proposal for the NSW gas networks 1 July 2010 – 30 June 2015*, June 2010, pp. 135–138 (AER, *Final decision: JGN access arrangement*, June 2010).

[535]    McKenzie and Partington, *Risk, asset pricing and WACC*, June 2013. p. 28.

[536]    E. Fama and K. French, 'The Capital Asset Pricing Model: Theory and evidence', *Journal of Economic Perspectives*, 2004, vol. 18(3), pp. 29–46.

Australia.[537] We consider the Fama–French three factor model, therefore, is not fit for the purpose of forecasting equity returns for service providers in Australia.

A further concern with the model's fitness for purpose is that, as mentioned, it is not clear why the HML and SMB factors should be relevant predictors of returns. The method for constructing factors such as HML and SMB means that, even where the factors are observed in ex post returns, this does not mean that the same factors are priced ex ante.[538] In turn, we consider that the model is not intuitive or simple to understand.

Academic papers exist which demonstrate that the same empirical patterns observed in the United States (on which the Fama–French three factor model was developed) may not apply in Australia.[539] For example, a recent paper found that in Australia the SMB factor had a negative risk premium (although it was not statistically significant from zero).[540] This differs to the positive relationship between returns and the SMB factor that was found in the United States. A negative relationship is also contrary to the possible explanation that the SMB factor compensates for a firm's liquidity risk. Such counter intuitive results provide additional reasons to be cautious about using the model for estimating required returns for Australian energy utilities. Additionally, academic papers have found that in many regions, including in the United States, the size effect that was once prevalent has now diminished or disappeared, and it is not clear why this has occurred.[541] These results are not consistent with a model that can be implemented in accordance with good practice or a model that is informed by sounds empirical analysis.

Given the abovementioned limitations, it is informative to also consider the use of the model to date. We are not aware of Australian or overseas regulators that have relied upon the Fama–French model to estimate the return on equity.[542] Additionally, although Professor Myers thought that decision makers should not 'lock out' the use of the model for estimating the return on equity, in a submission from APIA he noted that, 'it [the Fama–French model] is used in practice for many important tasks, but *not* to estimate the cost of equity [original emphasis]'.[543] Professor Myers outlined some difficulties of using the model for estimating the return on equity. These included that in his experience, the factor exposures (that is, portfolio's exposure to the risks of small capitalisation stocks and of value stocks) are unstable when estimated for individual stocks and it is difficult to understand why the factor exposures bounce around when business risks appear stable.[544] That the model is not used by other regulators raises further concerns with the model's fitness for purpose, and that the factor exposures are unstable raises further concerns on whether it can be implemented in accordance with good practice.

We do not consider, therefore, that the Fama–French three factor model is sufficiently robust so as to avoid undue sensitivity to estimation errors. This arises from the observed instability in both the risk factors themselves (particularly in an Australian context) and the individual firm exposures to these risk factors (factor loadings). Further, the concern is amplified by the greater number of parameters when compared to other financial models. Each additional parameter increases the scope for

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[537] AER, *Final decision: JGN access arrangement*, June 2010, pp. 138–142.
[538] McKenzie and Partington, *Risk, asset pricing and WACC*, June 2013, p. 30.
[539] For example see, AER, *Draft decision: JGN access arrangement*, February 2010, pp. 114–116.
[540] See McKenzie and Parrington, *Risk, asset pricing and WACC*, June 2013, p. 31, citing T. Brailsford, C. Gaunt and M. O'Brien, 'The investment value of the value premium', *Pacific-Basin Finance Journal*, 2012, vol. 20(3), pp. 416–437. For other findings of negative size factor premiums see also R. Faff, 'A simple test of the Fama and French model using daily data: Australian evidence', *Applied Financial Economics*, vol. 14, 2004, pp. 83–92.
[541] M. Crain, *A literature review of the size effect*, 29 October 2011.
[542] AER, *Draft decision: JGN access arrangement,* February 2010, p. 108. *AER, Final decision: JGN access arrangement*, June 2010, p. 118.
[543] Myers, *Estimating the cost of equity*, February 2013, p. 6.
[544] Myers, *Estimating the cost of equity*, February 2013, p. 6.

estimation error such that, even if there were strong theoretical support for the additional parameters, the overall result might be less accurate than a simpler model.[545] One countervailing point is that parameter estimates can be determined without arbitrary filtering of data, however, the econometric derivation of these parameters limits the ability for any such filtering to be observed. This leads to concerns about data mining.

We consider the Fama–French three factor model is not particularly flexible to changing market conditions. As noted by the Brattle Group, the Fama–French three factor model requires an estimate of the risk free rate and the market risk premium similar to the Sharpe–Lintner CAPM.[546] For these parameters similar considerations as those discussed in the Sharpe–Lintner CAPM assessment apply. However, the Fama–French three factor model also requires estimates for a number of other parameters that rely on historical data.

We consider that there are significant problems with the Fama–French three factor model. In combination, these limit its usefulness in estimating returns on equity. These concerns include that we consider the model is not based on well accepted economic theory, is not fit for purpose and is not implementable in accordance with good practice. Therefore, we propose not to use the Fama–French three factor model. The reasons for this are further outlined in section F.4.1.

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[545]   McKenzie and Partington, *Risk, asset pricing and WACC*, June 2013, p. 33.
[546]   Brattle Group*, Estimating the Cost of Equity*, February 2013, p. 26.

# F Return on equity: assessment of information against criteria

Chapter 5 outlined our proposed approach for estimating the return on equity for the benchmark efficient entity. This appendix provides further detail regarding the implementation of the second step within that approach.

Under step two of our proposed approach, relevant material is assessed against our criteria. These assessments are used to determine where in our approach the relevant material provides the most value in determining our return on equity point estimate. This process necessarily involves the use of regulatory judgement. The rationale for the determination of roles for the relevant material is discussed below.

## F.1 Foundation model

One possible use for relevant material under our proposed approach is as the foundation model. As outlined in chapter 5, the foundation model is used to determine the range for the final estimate of the return on equity. The foundation model point estimate also provides the starting point for the determination of the final return on equity.

Given the prominence of the foundation model in our approach, it is critical that the model substantively meets our assessment criteria. Our assessment of the relevant material against our criteria is that the Sharpe–Lintner CAPM is the only model suitable for use as the foundation model.

### F.1.1 Sharpe–Lintner CAPM

Our assessment of the Sharpe–Lintner CAPM is that it meets most of the criteria set out in chapter 2. These considerations are discussed in more detail in appendix E. For the following reasons, we consider that the Sharpe–Lintner CAPM may add the most value to our proposed approach as the foundation model:

- The Sharpe–Lintner CAPM—estimated as the sum of the risk free rate, and the product of the equity beta and MRP—is relatively simple to implement, and widely used by academics, market practitioners and economic regulators. Estimating the Sharpe–Lintner CAPM, therefore, is a process that stakeholders are likely to already be familiar with. This may allow stakeholders to make reasonable estimates of the returns expected to be determined in advance of a determination.

- Input parameter estimates for the Sharpe–Lintner CAPM can be supported by robust, transparent and replicable analysis. This includes the capacity for other relevant material to inform these parameter estimates. The model, therefore, facilitates the inclusion of a broad range of material, but may still provide some certainty to stakeholders as to the final return on equity value.

- The Sharpe–Lintner CAPM can be used to provide both a range of estimates, and a point estimate from within this range. This functionality may provide further certainty to stakeholders regarding the final return on equity value.

Based on the assessment against our criteria, and the reasons outlined above, we consider the Sharpe–Lintner CAPM is superior to other potential foundation models.[547]

## F.2 Inform input parameter estimates for the foundation model

An alternative to using relevant material as the foundation model is to use such material to inform the input parameter estimates of the foundation model. Consistent with the current rules framework, this represents a balance between the assessment of relevant material against our criteria, and the desirability of drawing on the broadest range of evidence available. For example, we propose to use the theory of the Black CAPM, and dividend growth model estimates, to inform the foundation model parameters. While these models have some empirical and theoretical support, implementing these models reliably can be practically difficult.

The estimation of input parameters will also be informed by a range of other information. This information was outlined in chapter 5, but is discussed in appendix G (which focuses on the estimation of the Sharpe–Lintner CAPM input parameters).

### F.2.1 Dividend growth model

Our assessment of dividend growth models is that they meet some of the criteria set out in chapter 2. These considerations are discussed in more detail in appendix E, and include the following:

- Dividend growth models are well grounded in economic theory, and have some empirical support.

- Dividend growth models are relatively simple to implement, and are widely used by academics, market practitioners and economic regulators.

- Dividend growth models are sensitive to refers in dividend yield estimates. This sensitivity is compounded by the small set of comparable firms from which to determine dividend yield estimates for Australian network service providers.

The sensitivity of dividend growth models to input errors limits the ability to use dividend growth models as the foundation model. For example, estimates of simple dividend growth models (such as those previously proposed by CEG) currently provide estimates of the return on equity for the benchmark efficient entity that are implausible. That is, as shown in appendix E, they provide estimates of the return on equity for the benchmark efficient entity that exceed the return on the market determined by the same model.

These implementation issues, however, are less prevalent when using dividend growth models to determine an estimate for the return on the market. Dividend growth model estimates, therefore, may be used (in addition to other evidence) to inform the MRP. Alternatively, they could be used as directional information for the return on equity. For the following reasons, we consider that dividend growth models may add the most value to our proposed approach by informing the range and point estimate of the MRP:

- It allows these estimates to directly impact the range and point estimate of the foundation model. Although our proposed approach also considers additional information to select a final return on equity value, the foundation model estimate may be more robust.

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[547] For example, the Black CAPM, Fama–French three factor model, and dividend growth models.

- It recognises that dividend growth model estimates may have more informative value than just providing an indication of the directional change in return on equity. For example, dividend growth models provide actual values for the return on the market. In contrast, information such as debt spreads do not indicate what value the return on equity should be, but instead, only provide relative information.

The estimation of the MRP is discussed in greater detail in appendix G.

## F.2.2 Black CAPM

Our assessment of the Black CAPM is that it may not meet most of the criteria set out in chapter 2. These considerations are discussed in more detail in appendix E, and include the following:

- The Black CAPM is well grounded in economic theory, and has some empirical support.

- Determining robust and transparent parameter estimates for the Black CAPM (notably, the return on the zero–beta portfolio) is difficult. Moreover, the model is particularly sensitive to these estimates.

The sensitivity of the model to implementation errors limits the ability to use the Black CAPM as the foundation model. That is, these implementation issues preclude the use of the Black CAPM to provide a direct estimate of the return on equity for the benchmark efficient entity or for the market. Under our proposed approach, therefore, it may be reasonable to conclude that the Black CAPM should not be used to estimate the return on equity.

As stated previously, however, drawing on a broader range of material may lead to estimates of the return on equity that best reflect efficient financing costs. The theoretical and empirical evidence may also support using the Black CAPM, to some extent, in the process for estimating the return on equity. For the following reasons, therefore, we propose to use the theory of the model to inform the selection of the equity beta point estimate:

- Unlike the Sharpe–Lintner CAPM, the Black CAPM does not assume that investors can borrow or lend at the risk free rate. Given this difference, we considered incorporating the theory of the Black CAPM into our foundation model by adjusting the risk free rate. The risk free rate, however, is readily observable.

- An alternative to adjusting the risk free rate is to instead focus on the selection of the equity beta. A key outworking of the Black CAPM is that the Sharpe–Lintner CAPM may underestimate the return on equity for firms with equity betas less than one. To the extent the Black CAPM may have some support, we propose to use the model (in addition to other evidence) to inform the selection of the equity beta.

The selection of the equity beta point estimate is discussed in appendix G.

## F.3 Inform estimate of the return on equity

In addition to using relevant material as the foundation model, or to inform the foundation model parameters, relevant material may be used to inform the overall return on equity point estimate. This approach is consistent with using material where it is fit for purpose.

As discussed in chapter 5, the form of information used to inform the overall return on equity point estimate may differ for each alternative source. For example, some of the information may provide a

range for the return on equity, while others may provide only directional information.[548] The form of the alternative sources of information (that we propose to use in our approach) are listed in Table F.4.

**Table F.4    Form of information used to inform the overall return on equity point estimate**

| Information source | Form of information |
|---|---|
| Wright approach | Range |
| Broker return on equity estimates | Range |
| Other regulators' return on equity estimates | Range |
| Takeover and valuation reports | Range |
| Credit spreads | Directional |
| Dividend yields | Directional |
| Comparison with return on debt | Relative |

Source:    AER analysis.

Figure F.2 and Figure F.3 also provide an indication of how additional information may be evaluated relative to the foundation model point estimate. These ranges and directional estimates are for illustrative purposes only.
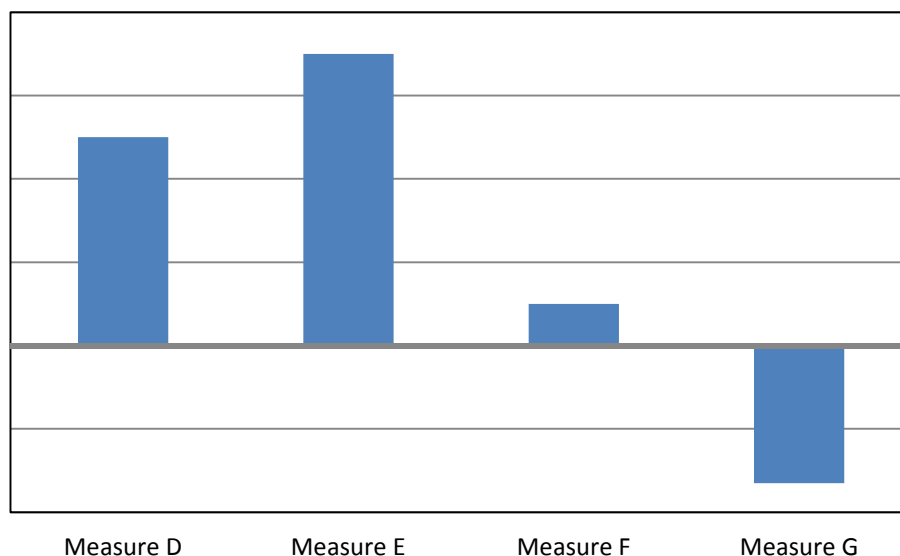
**Figure F.2    Return on equity estimates for the benchmark efficient entity (step 5)**
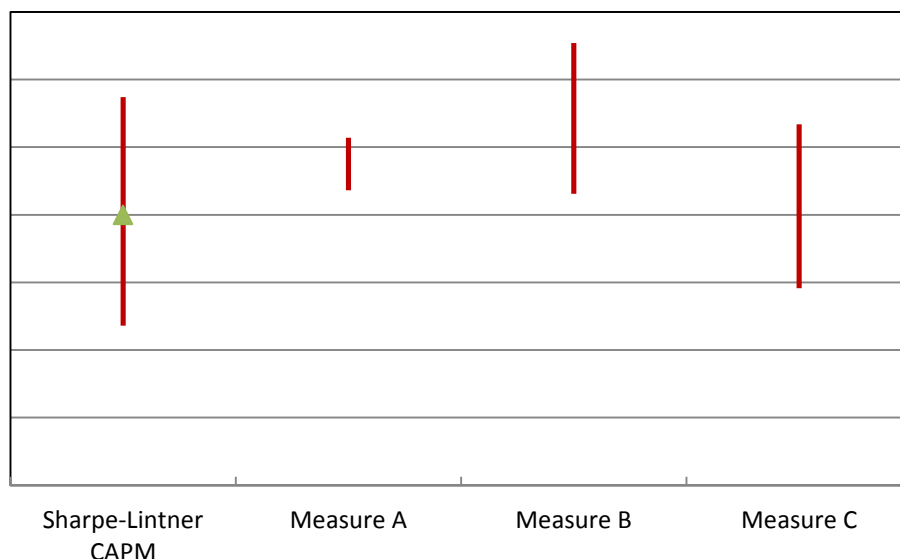


Source:    AER analysis.

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[548]    In this context, directional information refers to the relativity of current estimates to a baseline value (for example, the value or level of the estimate prevailing during a recent determination).

**Figure F.3     Directional information (step 5)**



Source:     AER analysis.

## F.3.1   Wright approach

The discussion on the Wright approach is separated into two sections. First, an outline of the approach is provided. The determination of the role of the Wright approach follows. The Wright approach is also discussed in appendix E.

### Outline of approach

During the Victorian gas access arrangement review, the Victorian gas service providers commissioned a report from Professor Stephen Wright.[549] In his report, Professor Wright proposed an alternative implementation of the Sharpe–Lintner CAPM for estimating the return on equity for the benchmark efficient entity. This approach is discussed in detail below.

Our current implementation of the Sharpe–Lintner CAPM estimates the return on equity with reference to the prevailing risk free rate, plus the product of the equity beta and the MRP. In effect, this simplifies the Sharpe–Lintner CAPM to the following formula:

- $k_e = r_f + \beta_e \times MRP$

Historically, our implementation has included relatively consistent estimates of the MRP. Estimates of the return on equity for the benchmark efficient entity, therefore, may appear to have effectively moved on a one–for–one basis with variations in the risk free rate.[550]

Instead of estimating the MRP directly, however, Professor Wright's approach separately estimates the components of the MRP—being the return on the market portfolio and the risk free rate. That is, the Sharpe–Lintner CAPM is described as follows:

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[549]   Professor Stephen Wright, *Response to Professor Lally's analysis*, November 2012.
[550]   Assume, for example, an equity beta of 0.8 and an MRP of 6.0 per cent. If the risk free rate fell from 4 per cent to 3 per cent, our estimation of the return on equity using the Sharpe–LintNER, CAPM would fall from 8.8 per cent to 7.8 per cent. That is, a 100 basis point fall in the risk free rate is followed by a 100 basis point fall in the return on equity.

- $r_e = r_f + \beta_e \times (r_m - r_f)$

Effectively, under the Wright approach the estimation of the MRP is replaced by the estimation of the return on the market. If the return on the market portfolio is assumed to be relatively constant, estimates of the return on equity for the benchmark efficient entity, therefore, will only move marginally with variations in the risk free rate.[551] A comparison of these alternatives—that is, estimating the Sharpe–Lintner CAPM with reference to the MRP or the return on the market—is shown below.

**Figure F.4        Alternative implementations of the Sharpe–Lintner CAPM**
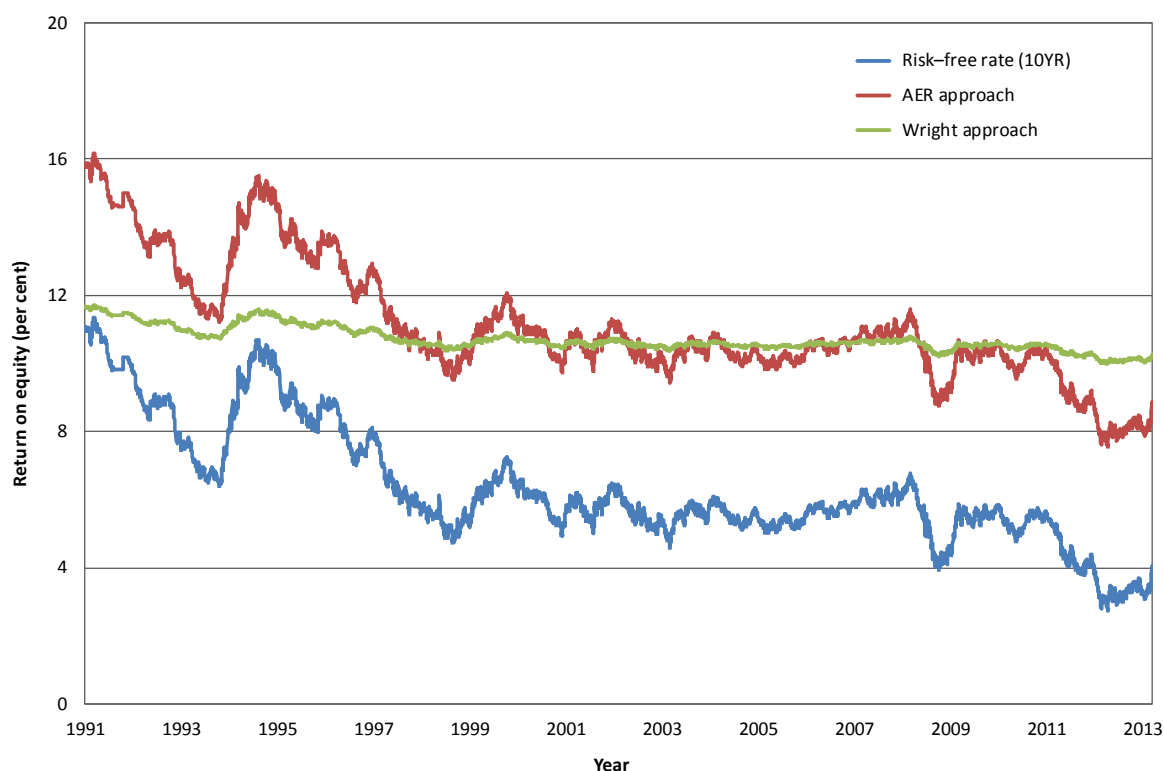


Source:     AER analysis.
Note:       For clarity, the series representing the AER's approach adopts a constant MRP of 6 per cent and equity beta of 0.8. These input parameters have been used for illustrative purposes only, consistent with the purpose for which this chart is being used.

## Determination of role

As noted previously, the Wright approach estimates the return on equity using the Sharpe–Lintner CAPM. Further, as outlined in section F.1.1, our assessment of the Sharpe–Lintner CAPM is that it may meet most of the criteria set out in chapter 2.

The Wright approach assumes that the relationship between the risk free rate and the MRP is perfectly negatively correlated.[552] Alternatively, our current implementation of the Sharpe–Lintner CAPM assumes that there is no relationship between the risk free rate and the MRP. There is no consensus in the academic literature, however, on the direction, magnitude or stability of the

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[551]    Assume, for example, an equity beta of 0.8 and a constant return on the market portfolio of 10 per cent. If the risk free rate fell from 4 per cent to 3 per cent, our estimation of the return on equity using the Sharpe–LintNER, CAPM would fall from 8.8 per cent to 8.6 per cent. That is, a 100 basis point fall in the risk free rate is followed by a less than 3 basis point fall in the return on equity.

[552]    Professor Stephen Wright, *Response to Professor Lally's analysis*, November 2012.

relationship between the risk free rate and the MRP. Instead, there is evidence to support both a positive and negative relationship.[553] Given these uncertainties—in particular, that the direction of any relationship may be variable and unstable—we consider it more reasonable to assume that no relationship exists between the MRP and risk free rate. This limits the ability to use Wright approach as the foundation model.

Notwithstanding the above, the Wright approach will inform the selection of the final return on equity point estimate from within the foundation model range. Specifically, we propose to use a range for the Wright approach. The use of a range is because the return on the market estimate (used to estimate the Wright approach) will vary dependent on the time period used. Using various time periods, therefore, will lead to a range of outputs.[554]

## F.3.2 Broker estimates of the return on equity

Broker reports are prepared by equity analysts to provide information for investors in listed companies. These reports generally include estimates of the rate of return, as well as other information (such as analysis of current financial positions and forecasts of future performance). These reports may also include estimates of the return on equity.

For the following reasons, we consider that broker estimates of the return on equity should play a role in our estimation of the return on equity:

- Equity brokers use these estimates to discount cash flows generated by regulated businesses. Using equity broker estimates of the return on equity to determine our rate of return, therefore, would be consistent with the original purpose of these estimates. This is consistent with our fitness for purpose criterion.

- Equity broker estimates of the return on equity are developed for listed service providers. These estimates, therefore, may be directly comparable to our estimates of the return on equity for the benchmark efficient entity. In this context, equity broker estimates of the return on equity may meet our criteria regarding using information which is credible and comparable.

Equity broker estimates of the return on equity, however, have a number of limitations. These include:

- Broker reports, generally, do not state the full assumptions underlying their analysis, or provide thorough explanations of how they arrive at their forecasts and predictions. These estimates, therefore, may not be implemented in accordance with our good practice criterion.

- All the comparable utilities covered by brokers undertake both regulated and unregulated activities. While brokers assess these activities in aggregate, only the regulated activities are directly relevant to the risk in providing regulated services. This may limit the extent to which these estimates meet our fitness for purpose criterion.

- Broker reports are published sporadically and do not always include details on the return on equity estimate. As a result, there may be a limited number of contemporaneous reports available at the time of a decision. These estimates, therefore, may not be sufficiently flexible to reflect changing market conditions.

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[553] See, for example: McKenzie and Partington, *Review of the AER's overall approach to the risk free rate and market risk premium*, 28 February 2013, pp. 21–30.
[554] Given the expected overlap of these alternative time periods, however, the range may be relatively narrow.

Given these limitations, broker estimates of the return on equity may only play a limited role in estimating the return on equity. To the extent that comparable broker estimates of the return on equity are available, we propose to use these estimates as a range to inform our estimate of the return on equity. In this context, consistency of this range with other additional information may be more informative than any individual estimate.

### F.3.3 Other regulators' estimates of the return on equity

Estimates of the return on equity developed by other regulators may also provide useful information to inform our estimate of the return on equity. As with broker estimates of the return on equity, we have not explicitly considered other regulators' estimates of the return on equity in the past. We have, however, considered other regulators' rates of return, and other regulators' estimates of the MRP.

For the following reasons, we consider that estimates of the return on equity from other regulators should play a role in our estimation of the return on equity:

- The rules frameworks which govern regulatory decisions typically require estimation methods and financial models to be based on well–accepted economic and financial principles.

- More generally, broader administrative law requirements require analysis to be well reasoned, transparent and publicly available. Accordingly, other regulators' estimates of the return on equity may meet our criterion regarding being implemented in accordance with good practice.

Other regulators' estimates of the return on equity, however, have a number of limitations. These include:

- Estimates from other regulators may not always be directly comparable to our estimates due to differences in the estimation approach. In particular, other regulators do not always use a benchmark efficient entity that is consistent with our definition.

- Estimates from other regulators may not always reflect prevailing market conditions, as there may be a delay between when the corresponding decisions are made. As such, these estimates may not be sufficiently flexible to allow changing market conditions to be reflected.

These limitations suggest that other regulators' estimates may only play a limited role in estimating the return on equity. To the extent that other regulators' estimates of the return on equity are available, we propose to use these estimates as a range to inform our estimate of the return on equity. In this context, consistency of this range with other additional information may be more informative than any individual estimate.

### F.3.4 Takeover and valuation reports

Takeover and valuation reports (also referred to as independent expert reports) are prepared for listed businesses in the event of certain transactions. These transactions include takeover bids, mergers and schemes of arrangement, acquisitions, divestitures, share buy-backs, and related party transactions. The Corporations Act 2001, ASX listing rules and ASIC regulatory guides have various provisions requiring such reports.

For the following reasons, we consider that takeover and valuation reports should play a role in our estimation of the return on equity:

- These reports can cover a wide range of issues that are not necessarily relevant to the cost of capital. However, they often contain estimates of the rate of return. Consistent with our fitness for

purpose criterion, therefore, these estimates may provide informative comparisons with our estimate of the rate of return.

▪ These reports are subject to statutory duties which require experts to be appropriately qualified. These reports are also required to be unbiased and transparent, and material sums of money change hands on the basis of these reports. As such, these reports may reasonably be expected to be informed by sound analysis, and developed in accordance with good practice.

▪ These reports are also publically available.[555] Estimates from takeover and valuation reports, therefore, may be verifiable and clearly sourced.

Takeover and valuation reports, however, have a number of limitations. These include:

▪ New reports are published sporadically, and as such, may not always be available at the time of each decision. As a result, these reports may not be sufficiently flexible to allow changing market conditions to be reflected in regulatory outcomes.

▪ Estimates of the return on equity in takeover and valuation reports may not be directly comparable to service providers' returns. This is because the businesses being valued will rarely have comparable risks to our benchmark efficient entity.

▪ The assumptions underlying the estimation of the rate of return in these reports are not always clear. Given this limited transparency, takeover and valuation reports may not be implemented in accordance with our good practice criterion.

These limitations suggest that takeover and valuation reports may only play a limited role in estimating the return on equity. In particular, takeover and valuation reports may only be suitable for providing estimates of the return on the market more broadly. To the extent that comparable estimates of the return on the market are available, we propose to use these to provide a range for our estimate of the return on equity. In this context, consistency of this range with other additional information may be more informative than any individual estimate.

### F.3.5 Credit spreads

The term credit spreads refers to the spread between the risk free rate and the return on debt for different debt instruments. These spreads change over time and are readily observable as both the return on debt and risk free rate are observable. Changes in credit spreads over time may offer information about changes in the market risk premium.

Academic literature offers some theoretical basis for considering credit spreads.[556] The literature explores the ability of credit spreads to explain equity returns as well as excess returns (the MRP). As such, credit spreads are reflective of economic and finance principles. However, we have expressed concerns in the past about the empirical support for this analysis.[557] There is a body of evidence

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[555] They are generally published on the ASX website.
[556] See, for example, SFG, *Market risk premium: An updated assessment and the derivation of conditional and unconditional estimates: Report for the Victorian electricity distribution businesses*, February 2012, p. 10.
[557] See, for example, AER, *Final decision: Access arrangement final decision: APA GasNet Australia (Operations) Pty Ltd 2013-17*, March 2013, Part 3, p. 49.

suggesting the analysis is not robust.[558] Also, we have expressed concerns about the comparability of credit spreads to equity premiums.[559]

Much of the literature on credit spreads suggests the analysis be performed against excess returns, (that is, the MRP). At the same time some of the literature performs the analysis against equity returns. As a result, it is not clear whether credit spreads would be fit for the purpose of informing the expected return on equity.

Also, credit spreads are readily observable and change daily. Therefore, they will reflect prevailing market conditions and will be credible, verifiable and timely.

Finally, we consider how credit spreads may be used in our decisions. For example, in a report submitted in 2011, SFG suggested the credit spread between AAA and BBB rated bonds was larger than 80 per cent of observations in the sample presented, and more than 0.77 standard deviations above the mean.[560] In a more recent report, CEG presented the graph below.

**Figure F.5    CEG graph of spreads between AAA and BBB benchmark bonds at 1 year to maturity**



Source:   CEG, *Update to March 2012 Report: On consistency of the risk free rate and MRP in the CAPM*, November 2012, p. 14.
Note:     We understand the y axis above should reflect 50 basis point increments.

It is difficult, however, to convert credit spread observations into a quantitative estimate of either the return on equity, or the MRP.[561] Accordingly, we consider that all we can take from this analysis is an indication of changes in market conditions. That is, an indication of whether spreads are widening, stabilising or falling. We propose, therefore, to use credit spreads as a directional indicator of the return on equity, along with other such indicators.

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[558]   See, for example, AER, *Final decision: Access arrangement final decision: APA GasNet Australia (Operations) Pty Ltd 2013-17*, March 2013, Part 3, p. 49.
[559]   AER, *Final decision: Access arrangement final decision: APA GasNet Australia (Operations) Pty Ltd 2013-17*, March 2013, Part 3, pp. 48–50.
[560]   SFG, *Market risk premium: Report for APT Petroleum Pipelines Ltd,* October 2011, p. 13.
[561]   SFG, *Market risk premium: Report for APT Petroleum Pipelines Ltd*, October 2011, p. 9.

## F.3.6 Dividend yields

In chapter 5 we highlighted dividend yields as a potential source of additional information. This section outlines dividend yields in more detail and considers them against the criteria. Dividend yields may provide an informative indication of changes in the required return on equity.

There is some empirical support for dividend yields as a predictor of equity returns and excess returns.[562] Regulated businesses and their consultants have proposed dividend yields are useful as an indicator, particularly for the MRP.[563] As such, these estimates are fit for the purpose of informing either the return on equity or the MRP.

In the past we have expressed concerns about the practical application of this information and the empirical support for such analysis.[564] There is a body of work which casts doubt on the accuracy of dividend yields as a predictor of excess returns.[565] Accordingly, it is not clear this analysis can be implemented in accordance with good practice. Advice from McKenzie and Partington has been that dividend yields are difficult to implement in practice.[566] At the same time, dividend yields will be sufficiently flexible to respond to changing market conditions. Similarly, they will be comparable and timely.

Finally, we consider how we might use dividend yields in our decisions. For example, in a report presented to the AER in 2011, SFG suggested the dividend yield at the time was larger than 92 per cent of observations in the sample presented, and more than 1.59 standard deviations above the mean.[567] The graph below is reproduced from that report.

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[562] See, for example, Fama and French, *Dividend Yields and Expected Stock Returns*, 1988, Journal of Financial Economics, 25, pp. 23-49.

[563] See, for example, CEG, *Update to March 2012 Report: On consistency of the risk free rate and MRP in the CAPM*, November 2012, pp. 15-16; SFG, *Market risk premium: Report for APT Petroleum Pipelines Ltd,* October 2011, pp. 13-14.

[564] See, for example, AER, *Draft decision: Access arrangement draft decision: APA GasNet Australia (Operations) Pty Ltd 2013-17*, September 2012, pp. 47-48.

[565] See, for example, AER, *Draft decision: Access arrangement draft decision: APA GasNet Australia (Operations) Pty Ltd 2013-17*, September 2012, p. 47.

[566] McKenzie and Partington, *Supplementary report on the MRP*, February 2012, p. 23.

[567] SFG, *Market risk premium: Report for APT Petroleum Pipelines Ltd,* October 2011, p. 13.

**Figure F.6    Dividend yields in late 2011**
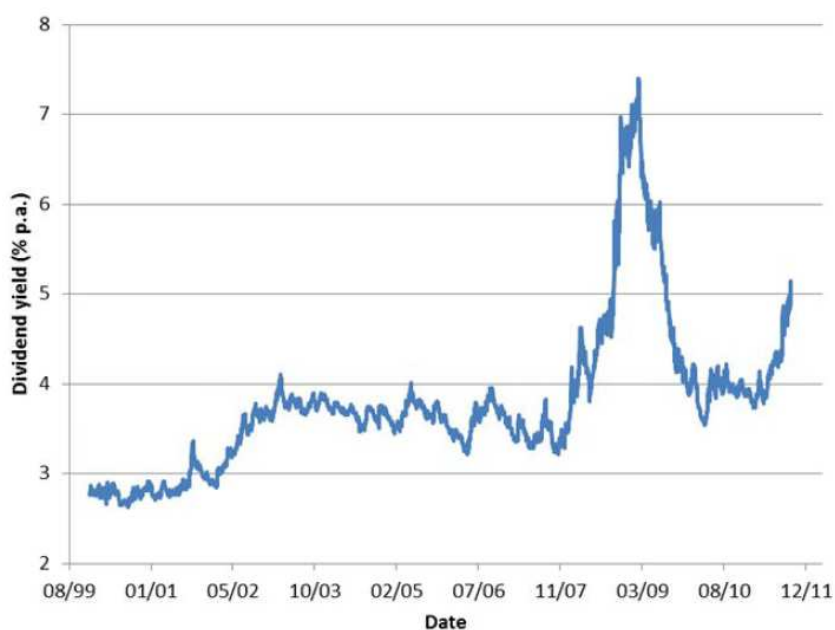


Source:    SFG, *Market risk premium: Report for APT Petroleum Pipelines Ltd*, October 2011, p. 14.

Using a reputable data provider, we could make similar observations at the time of each decision. As with credit spreads, however, it is difficult to convert dividend yield observations into a quantitative estimate of either the return on equity, or the MRP.[568] We propose, therefore, to use dividend yields as a directional indicator of the return on equity, along with other such indicators.

## F.3.7    Comparison between the return on debt and the return on equity

In chapter 5 we highlighted a comparison between the return on equity and return on debt as a potential source of additional information. This section outlines this comparison in more detail and considers it against the criteria.

In the consultation paper we noted that equity investors are residual claimants on a firm's assets in the event of default. It is typically expected, therefore, that equity investments are riskier than debt investments, and that the return on equity should exceed the return on debt. Accordingly, using it to assess the appropriateness of the allowed return on equity is fit for purpose and consistent with the original purpose of the analysis. Similarly, this comparison is reflective of economic and finance principles.

However, it is not clear the comparison is informed by sound empirical analysis. We noted in the consultation paper that the relationship is not simple and there is no agreement between academics about the extent of such a relationship.[569] We noted two particular concerns about the comparability of the two estimates:

- promised versus expected returns

- post–tax versus pre-tax returns.

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[568]    SFG, *Market risk premium: Report for APT Petroleum Pipelines Ltd,* October 2011, p. 9.
[569]    AER, *Better Regulation: Rate of Return Guidelines: Consultation paper*, May 2013, p. 83.

A simple comparison between the prevailing return on equity and the prevailing return on debt is transparent and replicable, but the informative value of such a comparison is limited. At the same time, many businesses use a premium for equity over their cost of debt when setting their required return on capital.[570] This suggests there is some market acceptance the relationship holds. Also, the comparison is sufficiently flexible to allow changing market conditions and new information to be reflected in regulatory outcomes.

The ENA highlighted and responded to the concerns above in its submission and suggested the probability of default should be quantified so that the allowed return on equity can be grossed-up accordingly. The ENA also submitted the return on equity for non-resident investors should be higher than the return on debt. It further submitted that the discussion of post-tax and pre–tax returns confuses the rationale for the comparison. It suggested the point is to compare the returns that investors require from different types of investment in the benchmark efficient entity. That is, to ask what would it take to convince an investor to invest in the benchmark efficient entity?[571]

The ENA's submission on this point is correct if the objective is to compare the returns investors require on debt and equity before personal tax.[572] However, if the objective is to compare such returns on a like–for–like basis, then an adjustment would be required to ensure consistency. Any adjustment is likely to introduce calculation error into the assessment.[573]

Finally, we consider how we might use the comparison between the allowed return on debt and the allowed return on equity in our decisions. We have considered this comparison in previous decisions. The figure below is reproduced from the Victorian gas final decision.[574]

**Figure F.7     Allowed return on equity vs. allowed return on debt**
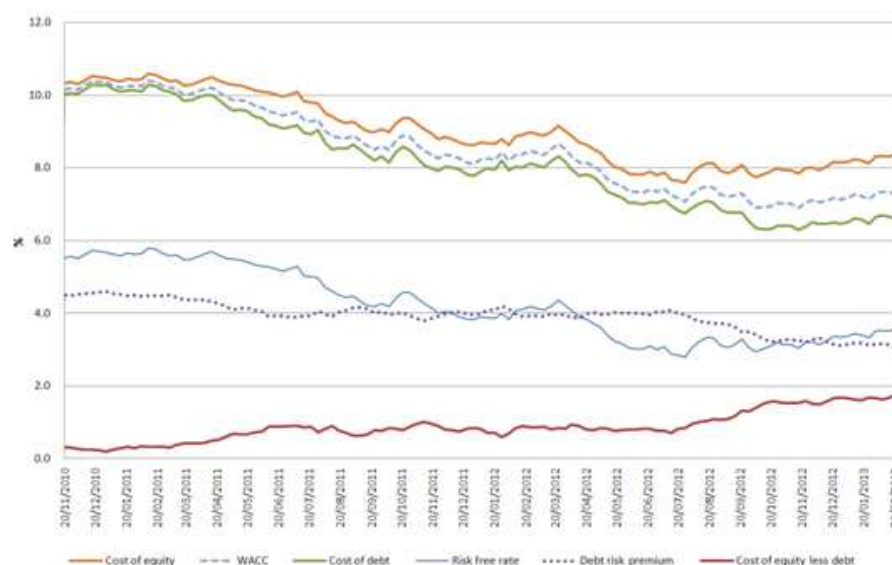


Source:     AER analysis.

As a result of the difficulties inherent in quantifying an appropriate spread between the two estimates, we do not consider it possible to define a spread requirement. At best, we can state that the prevailing

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570     The proportion of firms using return on debt plus approach could be as high as 47 per cent. See McKenzie and Partington, *Equity market risk premium*, 21 December 2011.
571     ENA, *Response to the AER's rate of return guidelines consultation paper*, 28 June 2013, p. 40.
572     McKenzie and Partington, *The relationship between the cost of debt and the cost of equity*, 14 March 2013, p. 21.
573     McKenzie and Partington, *The relationship between the cost of debt and the cost of equity*, 14 March 2013.
574     AER, *Access arrangement final decision Envestra Ltd 2013-17, part 3: appendices*, March 2013, p. 66.

return on equity should be greater than the prevailing return on debt. At the same time, we recognise the concerns raised by McKenzie and Partington that this comparison is not a like for like comparison due to the difference between promised and expected returns. Accordingly, we propose to use the spread between debt and equity returns as a relative indicator. For example, if the return on equity does not exceed the return on debt, we may reconsider the foundation model input parameter estimates. In these circumstances, we may also reconsider the foundation model itself.

## F.4 Methods, models, data or evidence not used to estimate the return on equity

The final category for consideration under step two is which relevant material will not be used for estimating the return on equity. This recognises that some material may not meet most of our assessment criteria, and/or may not be fit for the purpose of estimating the return on equity for the benchmark efficient entity.

### F.4.1 Fama–French three factor model

Our assessment of the Fama–French three factor model is that it may not meet most of the criteria set out in chapter 2. These considerations are discussed in more detail in appendix E.

The model has some empirical support, however, we consider the limitations of the model include:

- it does not have a strong theoretical underpinning

- the empirical patterns on which the model was developed may be variable over time, and may not apply in Australia

- it is complex to implement

- the variability of parameter estimates may limit the model's ability to robustly estimate the return on equity

- its purpose is not to estimate future returns on equity in Australia.

Based on these limitations, we consider that the Fama–French three factor model is not suitable to be used as the foundation model. Moreover, the limited theory underpinning the model is not amenable to using the model to inform the input parameter estimates of the foundation model. Accordingly, we propose to not use the Fama–French three factor model to estimate the return on equity.

### F.4.2 Brokers' and other regulators' estimates of the rate of return

Our assessment of brokers' and other regulators' estimates of the rate of return is that the material may not meet many of our criteria. In particular, we consider this material is not fit for the purpose of estimating the return on equity. For example, brokers' and other regulators' estimates of the rate of return are even less comparable to the return on equity of the benchmark efficient entity (than the corresponding estimates of the return on equity). The limitations of brokers' and other regulators' estimates, more generally, are discussed in sections F.3.2 and F.3.3.

Further, we propose to not use brokers' and other regulators' estimates of the rate of return to provide an assessment of our overall rate of return estimate. The reasons for this approach are discussed in chapter 4.

### F.4.3   RAB acquisition and trading multiples

Our assessment of RAB acquisition and trading multiples is that they may not meet many of our criteria. In particular, we consider this material is not fit for the purpose of estimating the return on equity. For example:

- Trading multiples and asset sales may differ from unity based on a range of factors, including that the regulatory rate of return is different to the returns required by investors. It is difficult, however, to isolate these factors.

- RAB acquisition multiples are available infrequently, whereas trading multiples may reflect the unregulated operations of the service provider.

We consider, however, that RAB acquisition and trading multiples may be used to provide an assessment of our overall rate of return estimate. The reasons for this approach are discussed in chapter 4.

### F.4.4   Financeability and credit metrics

Financeability is the term applied to a business' ability to finance its activities. In the context of regulated energy networks, these activities are those set out in service providers' licences. That is, the regulated services subject to our determinations.

In the consultation paper we stated that the financeability of a business is typically assessed by considering the revenues and cash flows of the businesses in relation to its financial liabilities. For example, credit rating agencies (such as Standard and Poor's and Moody's) carry out an assessment of the financeability of businesses from the perspective of debt investors. Also, IPART and Ofgem, use financeability tests as part of their determination processes.

These tests may prove useful in our decisions. At this stage, however, we have not formed a view on how these tests should be applied. Therefore, we do not propose these tests in the draft guideline. In the future, we may use these tests to inform our return on equity estimate.

The ENA submitted that financeability tests should not be used as an ex–post reasonableness test. Also, the ENA, Envestra, PIAC, APIA and the MEU all made submissions about the interrelationship between the assumptions about gearing and credit rating. This interrelationship is considered in the overall rate of return chapter above.

Further, the ENA submitted our recent return on equity estimates provide insufficient cash flows to ensure a BBB+ credit rating is maintained. It further submitted the approach for the return on equity should be tested to ensure the cash flows are sufficient to support the benchmark credit rating. As we have not used finanecability tests in our draft guideline, we also propose not to perform such a test. At the same time, however, we note that if the allowed return on equity meets the rate of return objective, it will by definition support the benchmark assumptions.

# G    Return on equity: Sharpe–Lintner CAPM parameters

In chapter 5 we considered the Sharpe–Lintner CAPM and noted the model requires appropriate parameter estimates. This appendix discusses our proposed approach for each of the parameters.

Using the Sharpe–Lintner CAPM, we will estimate a 10 year forward looking return on equity commensurate with prevailing conditions in the market for funds at the time of the determination. Accordingly, the individual parameter estimates will be 10 year forward looking estimates commensurate with prevailing conditions in the market for funds at the time of the determination. The rationale for a 10 year term is discussed in appendix D.

## G.1    Risk free rate

The risk free rate measures the return an investor would expect from an asset with no default risk.

### G.1.1    Proposed approach

We propose a 10 year forward looking risk free rate, commensurate with prevailing conditions in the market for funds at the commencement of the regulatory period.

In practice, the proposed approach has three core elements:

- The yield on Commonwealth Government Securities (CGS) is a reasonable proxy for the risk free rate.

- A 10 year term is appropriate.

- The averaging period should be short (e.g. 20 business days) and as close as practicably possible to the commencement of the regulatory period.

We consider the proxy and the averaging period in more detail below.

### G.1.2    Reasoning

#### Risk free rate proxy

CGS are a reasonable proxy for the risk free rate in Australia. This conclusion is supported by the fact that CGS are low default risk securities, the opinions of market experts and submissions we received.

Each of the three major credit rating agencies maintains the highest possible rating for the Australian Government.[575] Accordingly, CGS are low default risk securities and are therefore an appropriate proxy for the risk free rate.

Experts generally acknowledge that an observable proxy for the risk free rate is available in Australia. For example, the AER received advice from the RBA, Australian Treasury and AOFM in July 2012

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[575] Standard and Poor's, viewed 12 August 2013, http://www.standardandpoors.com/prot/ratings/entity-ratings/en/au/?entityID=268976&sectorCode=SOV; Moody's, viewed 12 August 2013, https://www.moodys.com/credit-ratings/Australia-Government-of-credit-rating-75300; Fitch Ratings viewed 12 August 2013, http://www.fitchratings.com/gws/en/esp/issr/80442187;

that supported the use of CGS yields as a proxy for the risk free rate in Australia.[576] In the RBA letter, Guy Debelle stated:[577]

> I therefore remain of the view that CGS yields are the most appropriate measure of a risk free rate in Australia.

Further, submissions on the consultation paper support the use of CGS as a proxy for the risk free rate. For example, the ENA submitted:[578]

> …the annualised contemporaneous yield on 10-year Commonwealth Government Securities continues to be an appropriate proxy for estimating the risk free rate.

We consider CGS yields credible and verifiable, comparable and timely, and clearly sourced. Also, the CGS yield is fit for the purpose of estimating the risk free rate and will reflect changes in market conditions.

## Risk free rate averaging period

For the following reasons, the averaging period should be short (e.g. 20 business days) and as close as practicably possible to the commencement of the regulatory control period:

- prevailing CGS yields are consistent with the CAPM

- a short averaging period provides a reasonable estimate of the prevailing rate while not exposing service providers to unnecessary volatility

- the market is liquid and functioning well, and is therefore likely to reflect the prevailing risk free rate

- the prevailing yield is the benchmark that risky investments must better

- the prevailing yield is a forward looking rate

- the method is unbiased.

In the recent Victorian gas final determinations, we explained the reasons listed above in more detail.[579] Further, in the same review process, we allowed service providers to nominate an averaging period so long as it was consistent with certain criteria.[580] The return on debt approach informed the rationale for allowing service providers to nominate an averaging period.[581] We formerly used an 'on the day' approach for the return on debt. In practice, this meant an estimate was required for both the risk free rate and the debt risk premium averaged from a short period before the determination.[582]

As the risk free rate was identical across both the return on debt and return on equity, estimating these returns in the same period ensured they were consistent. Also, our understanding of the hedging arrangements of service providers informed the rationale for allowing them some control of the averaging period.[583] Allowing service providers to nominate an averaging period inevitably meant

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[576] RBA, *Letter regarding the CGS market*, July 2012; Treasury and AOFM, *Letter regarding the CGS Market*, July 2012.
[577] RBA, *Letter regarding the CGS market*, July 2012, p. 1
[578] ENA, *Response to the consultation paper*, June 2013, p. 56.
[579] See, for example, AER, *Final decision: Access arrangement final decision: APA GasNet Australia (Operations) Pty Ltd 2013-17*, March 2013, Part 2, pp. 68-73 (AER, *Final decision: APA GasNet*, March 2013).
[580] AER, *Final decision: APA GasNet, March 2013*, Part 3, pp. 44-46.
[581] AER, *Final decision: APA GasNet, March 2013*, Part 3, p. 45.
[582] See, for example, AER, *Draft decision: Access arrangement draft decision: APA GasNet Australia (Operations) Pty Ltd 2013-17*, September 2012, Part 2, p. 102 (AER, *Draft decision: APA GasNet*, September 2012).
[583] AER, *Final decision: APA GasNet, March 2013,* Part 3, p. 45.

concurrent determinations could have different return on equity allowances, even there is no particular economic reason why service providers with the same regulatory control period should have different returns on equity.[584]

In the draft guideline we propose a move away from providing service providers with the flexibility to determine the exact dates of the risk free rate averaging period used for the return on equity calculation. We propose that we will nominate the risk free rate averaging period for the return on equity in the draft determination.[585] The nominated averaging period for the risk free rate will be:

- 20 consecutive business days in length[586]

- nominated in advance—that is, the averaging period will be after the draft determination but before the final determination

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

Finally, we note the ENA and NSW DNSPs support a long term average estimate (e.g. 10 year average) of the risk free rate.[587] In the Victorian gas draft and final determinations we considered the use of a long term average risk free rate.[588] We did not find the arguments in support of a long term average compelling.[589] Further, where the equity beta is not equal to one, using a long term average risk free rate can have a significant impact on the return on equity estimate.[590] Accordingly, we do not consider a long term average risk free rate appropriate.

In the draft guideline we use the Wright approach as a source of additional information at the return on equity level.[591] This approach recognises the possibility of a perfectly negative relationship between the risk free rate and the market risk premium (MRP). At the same time, it also recognises the importance of the equity beta estimate in determining the return on equity.

## G.2    Market risk premium

The MRP is the expected return over the risk free rate that investors require to invest in a well-diversified portfolio of risky assets. It represents the risk premium that investors who invest in such a portfolio can expect to earn for bearing only non-diversifiable (systematic) risk. The MRP is common to all assets in the economy and is not specific to an individual asset or business.

### G.2.1    Proposed approach

We propose a 10 year forward looking MRP, commensurate with prevailing conditions in the market for funds at the commencement of the regulatory control period.

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[584]    See, for example, AER, *Final decision: APA GasNet*, March 2013, Part 2, p. 55; AER, *Final decision: Access arrangement final decision: SPI Networks (Gas) Pty Ltd 2013-17*, March 2013, Part 2, p. 75; AER, *Final decision: Access arrangement final decision: Envestra Ltd 2013-17*, March 2013, Part 2, p. 114; AER, *Final decision: Access arrangement final decision: Multinet Gas (DB No. 1) Pty Ltd*, Multinet Gas (DB No. 2) Pty Ltd 2013-17, March 2013, Part 2, p. 97.

[585]    See chapter 7 for discussion of the averaging period for the return on debt.

[586]    In our experience, 20 business days has been the predominant averaging period over the past few years. See, for example, the Victorian gas review where three of the four businesses nominated a 20 business day averaging period. AER, *Final decision: APA GasNet, March 2013,* Part 3, p. 46.

[587]    See, for example, ENA, *Response to the consultation paper*, June 2013, p. 57; NSW DNSP, *Submission to AER's rate of return guidelines consultation paper*, 21 June 2013, pp. 13-14.

[588]    AER, *Draft decision: APA GasNet*, September 2012, Part 2, p. 84, Part 3, pp. 12-15; AER, *Final decision: APA GasNet, March 2013,* Part 3, p. 25-28, 43, 72-73.

[589]    AER, *Draft decision: APA GasNet*, September 2012, Part 2, p. 84, Part 3, pp. 12-15; AER, *Final decision: APA GasNet, March 2013,* Part 3, p. 25-28, 43, 72-73.

[590]    See, for example, Lally, *The present value principle: risk, inflation, and interpretation*, March 2013, p. 9.

[591]    See appendix E and F for further discussion of the Wright approach.

In determining an appropriate estimate of the MRP, we will consider a broad range of evidence, including:

- Historical excess returns

- Dividend growth model (DGM)

- Survey evidence

- Implied volatility

- Recent determinations among Australian regulators

We will use the available evidence and regulatory judgement to determine a range and a point estimate for the MRP. At the same time, we will consider any limitations with each source of evidence when estimating the MRP.

We note that service providers have also proposed dividend yields and credit spreads as conditioning variables for the MRP.[592] In the draft guideline we propose they be used only at the return on equity level. We are open to comments from stakeholders on an appropriate means of employing this information. We also note information will be used only once in determining the return on equity estimate.

## G.2.2 Reasoning

It is well recognised that the MRP cannot be directly observed. Unlike the risk free rate, the evidence available for estimating the MRP is imprecise and subject to varied interpretation. There is no consensus among experts on which method produces the best MRP estimate. In addition, different methods can produce widely different results at the same point in time.[593] For these reasons, it is reasonable to assess a range of evidence to inform the MRP estimate. In this assessment we must apply judgment to interpret the information before us.

There has been considerable debate about the MRP over the past few years. The recent Victorian gas final determination contained a thorough discussion of the theory and evidence on the MRP.[594] Stakeholders seeking more detail on these sources of evidence should refer to that determination.[595] Here we provide a brief overview of each source of evidence identified above:

- Historical excess returns—these provide an estimate of realised returns that stocks have earned in excess of the 10 year government bond rate. They can be directly measured. Although not strictly forward looking, historical excess returns have been used to estimate a forward looking MRP on the view that investors base their forward looking expectations on past experience.[596]

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[592] See, for example, SFG, *Market risk premium: Report for APT Petroleum Pipelines Ltd*, October 2011, pp. 9-14.

[593] See: Damodaran*, Equity risk premiums: determinants, estimation and implications - the 2012 edition*, March 2012, p. 93. He also noted: "No matter what the premium used by an analyst, whether it be 3% or 12%, there is back-up evidence offered that the premium is appropriate."

[594] See, for example, AER, *Final decision: Access arrangement final decision: SPI Networks (Gas) Pty Ltd 2013-17*, March 2013, Part 2, pp. 80, 95-111, Part 3, 46-56.

[595] See, for example, AER, *Final decision: Access arrangement final decision: SPI Networks (Gas) Pty Ltd 2013-17*, March 2013, Part 2, pp. 80, 95-111, Part 3, 46-56.

[596] Australian Competition Tribunal, *Application by DBNGP (WA) Transmission Pty Ltd (No 3) [2012] ACompT 14*, 26 July 2012, paragraph 153.

Further, recent empirical evidence suggests there may be no better predictor of excess returns than the historical average.[597]

We consider historical excess returns fit for the purpose of estimating the MRP. This evidence is the simplest form available for estimating the MRP. The evidence is also credible and verifiable and clearly sourced. Although the estimate changes slowly over time we consider it is likely to reflect prevailing market conditions if investor expectations are guided by historical excess returns.

▪ Dividend growth model (DGM)—variations of the DGM are discussed in more detail in appendix H. DGM estimates of the MRP are often considered forward looking estimates.[598] A difficulty with this source of evidence is the importance of the inputs to the model (such as the growth rate) and the assumptions necessary to determine those inputs.[599]

We consider the DGM against our criteria in appendix E. The implementation of DGM is generally relatively simple and the underlying theory is well accepted and sound. The determination of robust and transparent estimates, however, depends on the reliability and breadth of available input data. Sufficiently robust data sources exist for the Australian market as a whole ensuring it is reasonable to estimate the MRP. The model is also sufficiently flexible to reflect changes in market conditions.

▪ Survey evidence— surveys of market practitioners and academics are relevant as they reflect the forward looking MRP applied in practice. However, there are limitations with this type of evidence.[600] The Tribunal has identified criteria which surveys should satisfy to be useful.[601]

We consider survey evidence fit for the purpose of estimating the MRP. However, we are mindful of the limitations of this evidence identified by the Tribunal.[602] Also, it won't necessarily be clear whether the information is credible and verifiable, or clearly sourced.[603] Similarly, given surveys are undertaken sporadically, this evidence will not necessarily be flexible enough to reflect changing market conditions and new information.

▪ Implied volatility—service providers have proposed the implied volatility glide path approach in the past. The implied volatility approach is based on an assumption that the MRP is the price of risk times the volume of risk (volatility), which is based on Merton (1980). While we have expressed concerns about the reliability of these estimates we recognise they may have some informative value.[604]

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[597] See, for example, Dimson, Marsh and Staunton, *Credit Suisse Global Investment Returns Sourcebook 2012*, February 2012, p. 36.

[598] For example, in a report for the APIA, the Brattle Group made this suggestion. The Brattle Group, *Estimating the return on equity for regulated companies*, February 2013, p. 30.

[599] AER, *Final decision: Access arrangement final decision: SPI Networks (Gas) Pty Ltd 2013-17*, March 2013, Part 2, p. 101.

[600] AER, *Final decision: Access arrangement final decision: SPI Networks (Gas) Pty Ltd 2013-17*, March 2013, Part 2, p. 105.

[601] Australian Competition Tribunal, *Application by Envestra Limited (No 2) [2012] ACompT 3*, 11 January 2012, paragraphs 159–163.

[602] For example Australian Competition Tribunal, *Application by Envestra Limited (No 2) [2012] ACompT 3*, 11 January 2012, paragraphs 159–163.

[603] The quality of survey evidence is influenced by the design of the survey as well as the responses received from market participants and academics. As the respondents are unknown, the responses are not verifiable. See, the Victorian gas final decision for further discussion of survey evidence.

[604] AER, *Final decision: Access arrangement final decision: SPI Networks (Gas) Pty Ltd 2013-17*, March 2013, Part 2, pp. 103-105.

We consider implied volatility fit for the purpose of estimating the MRP. However, we have previously identified limitations to this evidence and it is also not simple to put into practice.[605] However, implied volatility analysis will reflect changing market conditions and new information.

- Recent determinations among Australian regulators—these estimates provide an indication of regulatory practice for the MRP in Australia. There are limitations to this source of evidence, such as the comparability of the assumptions underlying the determination (such as the benchmark efficient entity). Also, there may not be recent determinations made by other Australian regulators when we make a determination.

  We consider recent determinations among Australian regulators fit for the purpose of estimating the MRP. These determinations will be credible and verifiable, and clearly sourced. However, it is possible such determinations will not be comparable and timely.

In determining the MRP, we propose to consider each of these indicators. This is consistent with our practice over the past five years where we have determined values for the MRP in the range of 6.0 to 6.5 per cent. We are continuing to consider and review a range of material on the MRP, as it becomes available. We will draw on this material and will consider market circumstances and more up to date information when determining the MRP at each determination.

## G.3    Equity beta

One of the input parameters to the CAPM is labelled beta (often using the Greek letter, $\beta$). This parameter is a measure of the 'riskiness' of an asset's return compared with the return on the entire market. A higher beta indicates a relatively higher risk; a lower beta indicates a relatively lower risk. Where the CAPM is being used to determine the return on equity (as it is here), the more specific term equity beta is relevant.[606]

### G.3.1    Proposed approach

We propose to determine the equity beta of the benchmark efficient entity using both conceptual (theoretical) and empirical analysis. The conceptual analysis will include analysis of the underlying risk characteristics for the benchmark efficient entity and provide a framework for the empirical analysis. The empirical estimates will be generated using a number of different comparator sets and a range of appropriate econometric techniques. This body of empirical evidence will then be interpreted with regard to its relevance to the circumstances of the benchmark efficient entity. We propose to determine both a range for the equity beta and a point estimate from within this range.

A more detailed overview of this proposed approach is set out below.

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[605]    For example, in the Victorian gas final decision we identified a number of concerns with this approach. This included whether the approach provided a reasonable estimate of the 10 year MRP and determining what is the most reliable methodology. AER, *Final decision: Access arrangement final decision: SPI Networks (Gas) Pty Ltd 2013-17*, March 2013, Part 2, pp. 103-105.
[606]    In particular, using equity beta distinguishes it from debt beta or asset beta. In this chapter, the term 'beta' in isolation should be read as equity beta; and other uses will be explicitly labelled.

## Conceptual analysis

We propose to begin with examination of the conceptual risk factors relevant to equity beta for the benchmark efficient entity.[607] This conceptual analysis provides a framework for the selection of the comparator set and the interpretation of the empirical estimates.

This includes consideration of issues where there exists a theoretical link to systematic risk exposure, but where there may be little prospect for empirically resolving the relationship. Several relevant issues are already apparent. We expect to consider the conceptual implications of:

- changes to the return on debt calculation (i.e. the movement to a trailing average) and other aspects of the return on capital determination

- other concurrent changes to the regulatory regime (e.g. other aspects of the Better Regulation program, such as changes to expenditure assessments)

- the Black CAPM (an alternative to the standard CAPM) for the determination of equity beta[608]

- differences between the benchmark efficient entity and the available real world firms which comprise the comparator sets.

In each of these cases it might be possible to identify a directional impact, even if the magnitude cannot be quantified.

A final role for conceptual analysis occurs after the determination of empirical estimates, when assessing the pattern of results and investigating any conflicting information. It may be possible to identify conceptual mechanisms underlying these conflicts.

We acknowledge the limitations of conceptual analysis, and in particular that it is difficult to quantify the identified risks.[609] In this sense, the conceptual analysis is informative and the empirical analysis is determinative for the final equity beta estimate.

### *Comparator set selection*

We propose to identify real world firms that share all, most or some of the key characteristics of the benchmark efficient entity. These close comparator firms are then grouped into comparator sets around shared key characteristics. In practice, there may be no firms that entirely align with the conceptual benchmark, and only a few firms that are very close to the benchmark. Hence, there is an inverse relationship between the size of the comparator set and the relevance of the results from that set. Relaxing the threshold to include firms with less similarity to the benchmark efficient entity will allow a larger comparator set that is more statistically reliable. However these results are consequentially less relevant to the benchmark.

Several relevant comparator sets are already apparent. The closest possible comparator set is comprised of firms operating electricity and gas networks in Australia. One way to obtain a larger

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[607] This examination builds on the benchmark firm analysis included in chapter 3 (benchmark efficient entity). It is informed by two recent reports: Frontier Economics*, Assessing risk when determining the appropriate rate of return for regulated energy networks in Australia: A report prepared for the AER*, June 2013; and McKenzie and Partington, *Risk, asset pricing models and WACC: Report to the AER*, June 2013.

[608] For clarity, the inclusion of the Black CAPM in this way arises from earlier parts of the rate of return determination, which assessed the strengths and weaknesses of this model in order to determine how it can best be used to inform the rate of return estimate.

[609] McKenzie and Partington, *Risk, asset pricing models and WACC: Report to the AER*, June 2013, p. 17.

sample is to include firms from other sectors, including other utilities (such as water networks) or infrastructure firms more generally. Another option is to include international comparators, either overseas energy networks or more generally overseas utilities. In any of these expanded comparator sets, due consideration must be given to the differences between the benchmark and the comparator set (for example, the different regulatory, economic and geographical environment in the foreign country),

We also propose to include consideration of the relevant time period for the analysis as part of the comparator set selection. Including a longer time series allows a larger data set and therefore more statistically reliable empirical estimates. However, analogous to the selection of firms, there is a trade-off since the older data may not be as relevant to the circumstances of the benchmark efficient entity. There are also issues around the inclusion or exclusion of particular time periods (such as the technology bubble in the early 2000s or the GFC).

We propose to determine estimates of equity beta for the different comparator sets. We will then interpret these results with regard to the differing characteristics of the firms comprising each comparator set and the benchmark efficient entity.

## Econometric techniques

We propose to assess the various econometric and statistical techniques that might be used to generate the empirical estimates. This includes examination of the theoretical rationale for each technique and its relevance to the task at hand. This is not necessary a first–past–the–post evaluation; it may be that for a particular issue, several techniques have merit. In this case, we propose to implement each of the valid options in order to assess how robust the underlying results are.

Several econometric issues are already apparent. We expect to consider the appropriate adjustment mechanism for differences between the gearing of the comparator set and the benchmark efficient entity. We expect to consider the possibility of systematic bias in the regression procedure and the validity of Blume or Vasicek adjustments.[610]

We propose to apply appropriate econometric and statistical techniques, including permutations of valid alternatives. We will then interpret these results with regard to the relevance and reliability of the underlying calculations.

### *Evaluation of empirical estimates*

At the final step, we propose to evaluate the entire information set relevant to equity beta. This information set will include empirical estimates generated with different comparator sets and different econometric techniques. It will also include information on the interpretation of each of these permutations, such as the relevance and reliability of the underlying comparator set and econometric techniques. It will include conceptual analysis that informs the interpretation of these empirical estimates.

We propose to select an equity beta range, and a point estimate from within this range. In arriving at the estimate of the equity beta, we will have regard to the level of imprecision in the available empirical evidence, consistent with the AER's previous regulatory practice.

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[610] These adjustments are discussed in detail in the 2009 WACC review.

## G.3.2 Reasoning

The starting point for understanding equity beta is the distinction between business specific risk and market wide risk. Events which affect the returns on any one particular business are of little concern to an investor who holds a large diversified portfolio. This business specific risk can be diversified away by holding many different stocks. However, events which affect all stocks in the market – for example, broad economic events like a recession – will affect all the stocks the investor holds, even if they hold a diversified portfolio. This market wide risk (often labelled systematic risk or non-diversifiable risk) is the only form of risk that requires compensation under the CAPM. Equity beta reflects the exposure of any particular asset to this market wide or systematic risk.

In statistical terms, equity beta measures the standardised covariance between the returns on an individual risky business and the returns on the overall market. An intuitive understanding of the role for equity beta can be seen by looking at the CAPM equation in this form:

- $k_e = r_f + \beta \times MRP$

To determine the return on equity ($k_e$), the equity beta ($\beta$) is multiplied by the market risk premium (MRP) and added to the risk free rate ($r_f$). Hence, the equity beta scales the MRP up or down to reflect the risk premium—over and above the risk free rate—equity holders would require to hold that particular risky business as part of their well diversified portfolios. An equity beta of one implies that the business' returns have the same level of systematic risk as the overall market. An equity beta less than one implies the business' returns are less sensitive to systematic risk than the overall market ('less risky'), and an equity beta greater than one implies the business' returns are more sensitive ('more risky').

In the 2009 WACC review, we observed that previous regulatory determinations for the energy service providers (across electricity and gas, distribution and transmission) had applied equity betas in the range 0.7 to 1.1.[611] However, the explicit remit of the 2009 review was to determine the equity beta for electricity networks (distribution and transmission), where the previously applied beta was either 0.9 or 1.0. Our legislated task was to determine if there was persuasive evidence to depart from these figures.

In that review, we assessed a broad range of conceptual and empirical evidence on equity beta in great detail.[612] This included consideration of a comparator set that included firms operating electricity and gas networks, after we concluded that these firms were close comparators.[613] The best empirically determined point estimate of equity beta for the benchmark efficient entity was in the range 0.41 to 0.68. We also had regard to a range of other considerations, including the potential limitations of the CAPM and the importance of regulatory stability. In the 2009 WACC review final determination, we concluded that there was persuasive evidence to depart from the previous values (of 0.9 or 1.0) and determined an equity beta of 0.8 for electricity distribution and transmission.[614] Subsequent gas determinations reviewed the evidence and also determined that the relevant equity

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[611] AER, *Final decision: Electricity transmission and distribution network service providers: Review of the weighted average cost of capital (WACC) parameters*, May 2009, p. 242.

[612] AER, *Explanatory statement: Electricity transmission and distribution network service providers: Review of the weighted average cost of capital (WACC) parameters*, December 2008, pp. 181–253; and AER, *Final decision: Electricity transmission and distribution network service providers: Review of the weighted average cost of capital (WACC) parameters*, May 2009, pp. 239–344.

[613] AER, *Final decision: Electricity transmission and distribution network service providers: Review of the weighted average cost of capital (WACC) parameters*, May 2009, pp. 104–110, 255–260.

[614] AER, *Final decision: Electricity transmission and distribution network service providers: Review of the weighted average cost of capital (WACC) parameters*, May 2009, pp. 341–344.

beta for gas distribution and gas transmission was 0.8.[615] In general terms, this equity beta value indicated that investments in regulated energy networks were slightly less risky than the average firms in the market. Since the 2009 WACC review, we applied an equity beta of 0.8 to all revenue determinations (electricity transmission, electricity distribution, gas transmission and gas distribution.

Because the conceptual analysis is largely concerned with relative assessments—for example, the relative risk assessment between sectors of the energy market, or between the energy market and an 'average' firm in the stock market—this type of analysis does not lend itself to determining actual estimates of the equity beta. Rather, it lends itself to relative assessments. For example, whether firms across electricity transmission, electricity distribution, gas transmission and gas distribution should have the same or different equity betas. Given, the average firm in the market has an equity beta of one, relative assessments can be made as to whether the equity beta of an energy firm should be above one, about one, or below one. Accordingly, we propose to use the conceptual analysis to inform these sorts of relative judgements.

The historical empirical estimates are the main form of evidence to determine actual equity beta values. Accordingly, we propose to use the empirical estimates to guide the equity beta value we adopt. However, our interpretation of these empirical estimates will be tempered by our incorporation of the theory behind the Black CAPM—this is explained further in appendices E and F.

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[615]   For example, see AER, *Draft decision: ActewAGL Access arrangement proposal for the ACT, Queanbeyan and Palerang gas distribution network, 1 July 2010 - 30 June 2015*, November 2009, pp. 62–64, 195–204; AER, *Final decision: ActewAGL Access arrangement proposal, ACT, Queanbeyan and Palerang gas distribution network, 1 July 2010 - 30 June 2015*, March 2010, pp. 63–68; AER, *Draft decision: N.T. Gas, Access arrangement proposal for the Amadeus Gas Pipeline, 1 July 2011 - 30 June 2016*, April 2011, pp. 83–85, 196–198; and AER, *Final decision - Public: N.T. Gas, Access arrangement proposal for the Amadeus Gas Pipeline, 1 August 2011 - 30 June 2016*, July 2011, pp. 67–70.

# H    Return on equity: dividend growth models

This appendix discusses the methodology and use of dividend of growth models for estimating the return on equity.

## H.1    Methodology

Dividend growth models (DGM) are based upon a discounted cash flow formula, according to which the price of a share is equal to the discounted stream of expected future dividends per share into perpetuity. In order to use this formula to estimate the return on equity, certain assumptions must be made. One common assumption is that there is a single discount rate rather than a different discount rate for each future period.[616] Given this assumption, the discounted cash flow formula can be specified as follows:

- $P_0 = \sum_{t=1}^{\infty} \frac{E(D_t)}{(1+k)^t}$

where:

- $P_0$ is the current price of equity

- $E(D_t)$ is the current expectation of dividends per share at time t

- k is the discount rate—that is, the return on equity.

In order to solve this equation for the return on equity, an assumption must be made about expected future dividends. The simplest such assumption is that the expected long-term growth rate in nominal dividends per share is constant at g. Given this assumption, it can be shown that the return on equity is as follows:

- $k = [E(D_1)/P_0] + g = [(D_0(1+g)/P_0] + g$

That is, the return on equity is equal to the sum of the dividend yield and the growth rate. This is referred to as the constant-growth DGM.

If there is reason to think that investors do not expect that dividend growth is constant, then it may be appropriate to use a version of the DGM that does not assume constant growth. One such model is the two-stage DGM, which relaxes the assumption of constant growth. The two-stage DGM divides future time periods into two stages—in the second stage, dividend growth is assumed to be constant but in the first stage the growth rate may vary. A two-stage DGM in which dividend growth is assumed constant after period N is characterized by the following formula:[617]

$$P_0 = \sum_{t=1}^{N} \frac{E(D_t)}{(1+k)^t} + \frac{\frac{E(D_N)(1+g)}{k-g}}{(1+k)^N}$$

If data is available on (i) the stock price, (ii) expected dividends over the first N periods and (iii) g, then an estimate of the return on equity, k, can be backed out of this equation.

The Brattle Group report, which was prepared for the APIA submission, observes that 'most recent' implementations of the DGM avoid the restrictive constant growth assumption, and instead use a

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[616]    In other words, the assumption is that the discount rate does not have a term structure.
[617]    Shannon Pratt and Roger Grabowski, *Cost of Capital: Applications and Examples*, 4th Ed. (Hoboken: Wiley, 2010), p. 32.

multi-stage DGM.[618] Professor McKenzie and Associate Professor Partington also express concerns about the constant growth version of the DGM. They advise that the constant growth version of the DGM 'may be too rough even to act as a reasonableness check'. Based on these considerations, we propose to use a multi-stage version of the DGM.[619]

There are a variety of different versions of multi-stage DGMs: both two-stage and three-stage models are relatively common; and different models have different characterizations of the trajectory of expected dividends during each stage.

## H.2 Using the DGM to estimate the market return on equity and the market risk premium

In general, in order to implement any version of the DGM, it is necessary to make certain strong assumptions which may not hold in reality. The versions of the DGM differ based on which strong assumption or assumptions they make. For example, the assumption that the discount rate does not have a structure (which, as NERA observes, is typically made for 'commercial use') is a strong assumption.[620] Even when a DGM makes a different assumption about the term structure of the discount rate, that assumption can still be questioned.[621] Despite the strong assumptions made by DGM, they are still useful models of the rate of return on account of their solid theoretical foundation and their relative simplicity and transparency. In selecting an appropriate form of the DGM, the AER is guided particularly by considerations of simplicity and transparency. On the one hand, to choose a relatively complex and opaque version of the DGM would lose the principal merits of the model. On the other hand, a constant-growth DGM is excessively simplistic. In balancing these considerations, we have adopted a comparatively transparent two-stage version of the DGM.[622] We note that several consultancy reports submitted by CEG to the AER use a two-stage DGM.[623]

In implementing the two-stage DGM, we have made two adjustments to the equation above. First, a 'partial first year' adjustment must be made for the case in which the date at which the model is estimated is not at the beginning of the financial year. Second, a midyear convention is adopted, to adjust for the fact that dividends are distributed not only at the end of the financial year but also during the year. Pratt and Grabowski's method is used for adjusting for partial first year and the midyear convention.[624]

We use the model to obtain estimates of the market return on equity for each month from January 2006 to June 2013. Data on expected dividends are taken from Bloomberg, which provides a historical series of estimates of forecasted dividends per share for (i) the current financial year (ii) the next financial year and (iii) the financial year after the next.[625] The S&P/ASX 200 index is taken as the

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[618]  Brattle Group, *Estimating the Cost of Equity for Regulated Companies: Prepared for APIA, 17 February 2013*, p. 29.
[619]  McKenzie and Partington, *Report to the AER: Risk, Asset Pricing Models and WACC*, June 27, 2013, p. 36.
[620]  NERA, *Prevailing Conditions and the Market Risk Premium: Report for APA Group, Envestra, Multinet and SP Ausnet*, March, 2012, p. 34.
[621]  For an example of a DGM which makes a different assumption about the term structure of the discount rate, see Lally, *The Dividend Growth Model*, 4 March, 2013.
[622]  We regard the excessively complex the approach presented in SFG, *Dividend Discount Model Estimates of the Cost of Equity*, June 2013.
[623]  CEG, *Estimating the Cost of Capital under the NGR: A Report for Envestra*, September, 2010, pp. 37-39; CEG, *Internal Consistency of Risk Free Rate and MRP in the CAPM: Prepared for Envestra, SP Ausnet, Multinet and APA*, March 2012, pp. 50-51. For another example of an implementation of a two-stage DGM, see Mika Inkinen, Marco Stringa and Kyriaki Voutsinou, 'Interpreting Equity Price Movements since the Start of the Financial Crisis', *Bank of England Bulletin*, 2010, Q1
[624]  Pratt and Grabowski, *Cost of Capital: Applications and Examples*, pp. 36-40.
[625]  CEG and NERA have also sourced their data on expected dividends per share from Bloomberg: see CEG, *Estimating the Cost of Capital under the NGR*, September, 2010, pp. 37-39; CEG, *Internal Consistency of Risk Free Rate and MRP in the CAPM*, March 2012 pp. 50-51; NERA, *Prevailing Conditions and the Market Risk Premium*, March, 2012, pp. 34-39.

market proxy. Dividend forecasts must be adjusted for the effect of imputation credits by the following factor:[626]

- $1 + \left\{ 0.7 \times 0.75 \times \frac{0.3}{1-0.3} \right\} = 1.225$

A crucial parameter for estimating a two-stage DGM is g, the expected long-term growth rate of nominal dividends per share. Associate Professor Lally has recently estimated g using the long-term expected growth rate of real GDP, which he evaluates to be 3 per cent. Lally observes, however, that this figure is in excess of the expected long-term growth in real dividends per share, citing the reasons given in an article by Bernstein and Arnott. Expected long-term growth in real GDP is higher than expected long-term growth in real dividends per share because of 'the net creation of shares' through (i) new share issuance (net of buybacks) and (ii) the emergence of new companies.[627] To estimate dividend per share growth from GDP growth, therefore, a deduction must be made. While Bernstein and Arnott argue for a deduction of 2 per cent, Lally argues that this is an overestimate, proposing instead a range of deductions: 0.5, 1.0 and 1.5 per cent.[628]

In estimating the expected long-term growth rate of real GDP, Lally relied primarily on historical averages over an averaging period of more than 100 years. So in the illustrative calculation below, we assume that the expected long-term growth rate of GDP is constant from 2006 to 2013 at 3 per cent. Moreover, in this calculation, the midpoint of Lally's proposed range of deductions is used—a deduction of 1 per cent. Thus the estimate of expected long-term growth in real dividends per share is 3 per cent less 1 per cent, which is 2 per cent. To use this figure to calculate nominal growth, assumptions about inflation expectations must be made. It is assumed that expected inflation is given by the midpoint of the RBA target range of 2 to 3 per cent. That is, it is assumed that expected inflation is 2.5 per cent. It follows that g, expected long-term growth in nominal dividends per share is:

- $g = 100 \times \{(1 + 0.02)(1 + 0.025) - 1\} = 4.6\ per\ cent$

Given this value for g and given an imputation adjustment of 1.225, the two-stage DGM generates estimates of the return on equity that are represented in Figure H.8 below. For the period from January 2006 to June 2013, the average return on equity for the market is 11.0 per cent.

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[626] This calculation assumes that the corporate tax rate is 30%, the proportion of franked dividends is 75% and theta is 0.7. It is based on the formula for the adjustment factor in Tim Brailsford, John Handley and Krishnan Maheswaran, 'Re-examination of the Historical Equity Risk Premium in Australia', *Accounting and Finance*, 48 (2008), p. 85. The same calculation appears in NERA, *Prevailing Conditions and the Market Risk Premium*, March, 2012, p. 38; CEG, *Internal Consistency of Risk Free Rate and MRP in the CAPM*, March 2012, p. 17, although they use a value for theta of 0.35. Such an adjustment is recommended in McKenzie and Partington, *Report to the AER: Risk, Asset Pricing Models and WACC*, p. 34.

[627] William Bernstein and Robert Arnott, 'Earnings Growth: The Two Percent Dilution', *Financial Analysts Journal*, (September/October 2003), pp. 47-55.

[628] Lally, *The Dividend Growth Model*, 4 March, 2013. Lally cites two facts which suggest that 2 per cent is an overestimate of the dilution factor: the 'declining dividend payout rate'; and the extent to which 'market capitalisation grows simply due to listings from foreign firms and from previously unlisted US firms (p. 14).

**Figure H.8    DGM estimate of return on equity for the market**
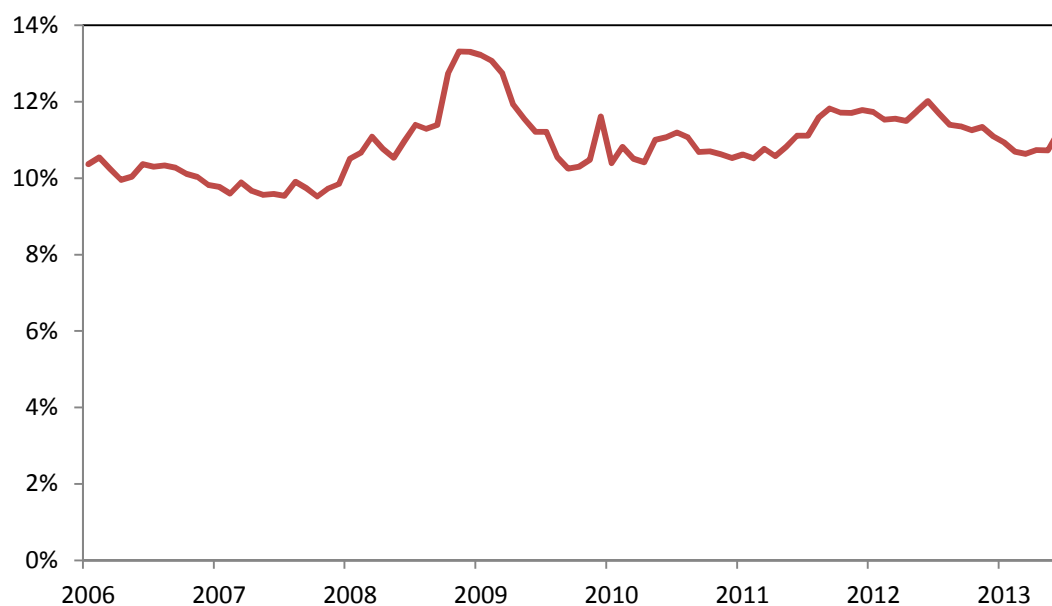


Source:    Bloomberg and AER analysis

This two-stage DGM model can be used to estimate the market risk premium by deducting the risk-free rate from the return on equity generated by the model.

## H.3    Using the DGM to estimate the return on equity for energy infrastructure businesses

A similar method might be used to obtain estimates of the return on equity for individual energy infrastructure businesses, potentially then averaged in order to obtain an estimate for the industry. In several reports, CEG used DGM modelling to estimate the return on equity for six energy infrastructure businesses. Subsequent to these reports, one of these six businesses, Hastings Diversified Utilities Fund, was taken over by the APA Group.[629] Thus data are now only available for five energy infrastructure businesses: APA Group; DUET; Envestra Limited; SP AusNet; and Spark Infrastructure Group. Given the strong assumptions made by DGM, we potentially have a concern about forming a benchmark estimate of the return on equity based on the data of five businesses. In contrast, the DGM estimate of the return on equity for the market, which is based on the S&P/ASX 200 index, draws on information about the prices and expected dividends of 200 companies. In the United States, when DGM estimates are calculated for energy infrastructure proxy groups, there are often more than five businesses in the proxy group.[630]
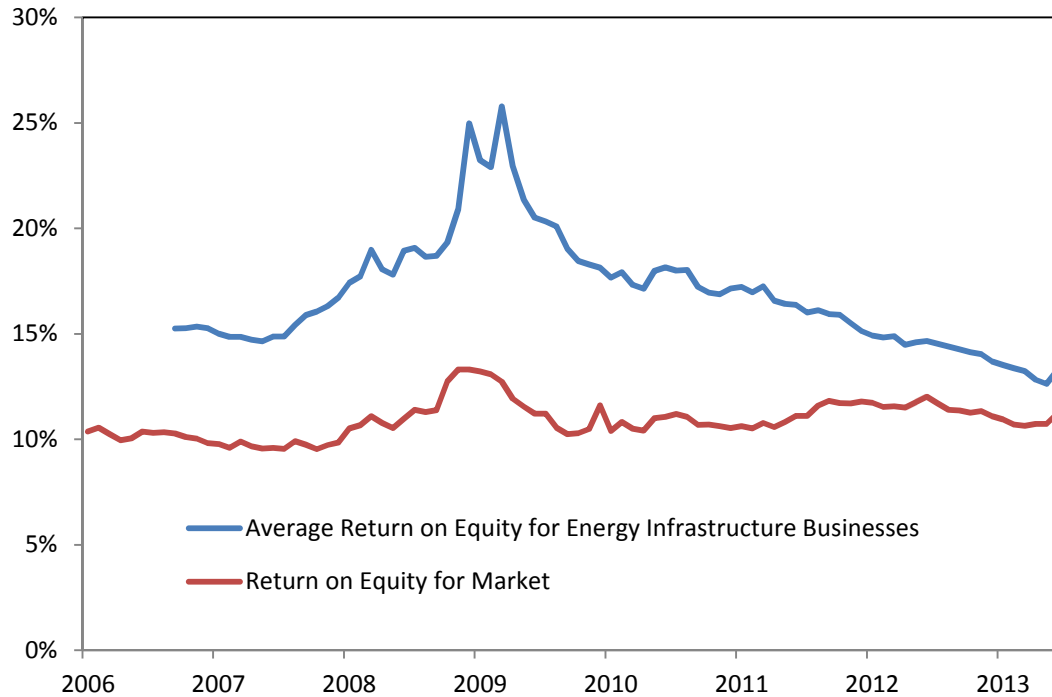
Nevertheless, we investigated the possibility of forming a benchmark estimate of the return on equity based on the return on equity generated by a DGM for each of the five energy infrastructure businesses. For each of the five firms, a historical series of the return on equity was estimated using the same methodology outlined above for estimating the return on equity for the market. The same two-stage version of the DGM was used. Estimates of expected dividends were obtained from Bloomberg for (i) the current financial year (ii) the next financial year and (iii) the financial year after

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[629]    CEG, *Estimating the Cost of Capital under the NGR*, September, 2010, pp. 37-39; CEG, *Internal Consistency of Risk Free Rate and MRP in the CAPM*, March 2012, pp. 50-51.
[630]    See, for example: 137 FERC, issued 14 October 2011.

the next. The same adjustment was made for imputation credits and the same parameter value was used for the expected long-term growth rate in nominal dividends per share. Figure H.9 below shows, for each month, the estimated average return on equity for the five energy infrastructure businesses, and compares it with the estimated return on equity for the market.

**Figure H.9    DGM estimates of the market return on equity and average return on equity for energy infrastructure businesses**

According to the above DGM analysis, the average return on equity for the energy infrastructure businesses is consistently higher than that of the market for each month from September 2006 to June of 2013.[631] Moreover, as Figure H.10 illustrates, for each of the five energy infrastructure businesses, the DGM generates an average return on equity over this period significantly in excess of the average return on equity for the market.

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[631]    For Spark Infrastructure, data are available only from September, 2006.

**Figure H.10    DGM estimates of the return on equity for the market and for the energy infrastructure businesses: average from September 2006 to June 2013**
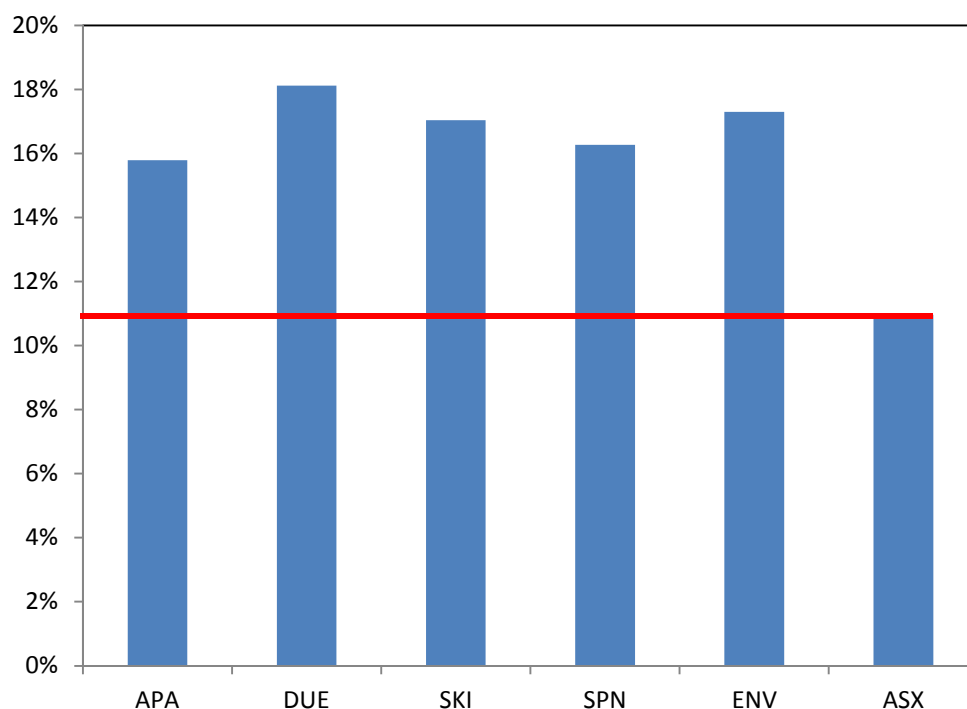


Source:    Bloomberg and AER analysis

These estimates give rise to two concerns about the using DGM estimates for the five energy infrastructure businesses to create a return on equity benchmark. First, the DGM estimates fail a basic 'sanity check': for each of the five infrastructure businesses, the average return on equity over the period is more than 400 basis points higher than the average return on equity for the market. Given the stylized fact that the systematic risk of such infrastructure businesses is not in excess of the systematic risk of the market, DGM estimates for the five infrastructure businesses are not plausible. Second, as Figure H.9 illustrates, the DGM estimates of the average return on equity for the energy infrastructure businesses varied considerably over the period: it was in excess of 20 per cent for several months at the onset of the global financial crisis, and remained above 15 per cent from August 2007 until the end of 2011. Both service providers and customers have a preference, all else equal, for greater stability in the estimated return on equity.

One diagnosis for these implausible estimates generated by the DGM is that the model assumed that for the energy infrastructure businesses the parameter for the growth of dividends, g, is the same as the growth for the market as a whole. It might be thought that energy infrastructure businesses have a lower growth rate than the market. However, even if it is assumed that for energy infrastructure businesses the expected long-term growth in real dividends per share is zero, the DGM estimates still fail this 'sanity check'. If the expected long-term growth in real dividends per share is zero, and the expected inflation is 2.5 per cent, then g, the expected long-term growth in nominal dividends per share is 2.5 per cent. For each of the five energy infrastructure businesses, Table H.5 displays the return on equity under the two growth assumptions of g = 4.6 and g = 2.5.

**Table H.5    DGM Estimates of the return on equity for the Market and for the Energy Infrastructure Businesses: average from September 2006 to June 2013**

| Entity | g = 4.6 % | g = 2.5 % |
|---|---|---|
| Australia Pipeline Trust (APA) | 15.8% | 13.9% |
| DUET (DUE) | 18.1% | 16.3% |
| Envestra Limited (ENV) | 17.3% | 15.4% |
| SP AusNet (SPN) | 16.3% | 14.4% |
| Spark Infrastructure Group (SKI) | 17.0% | 15.2% |
| Average of Energy Infrastructure Businesses | 16.9% | 15.0% |
| Market (S&P/ASX 200) | 11.0% | 9.0% |

Source:    Bloomberg and AER analysis

Even if it is assumed that for the energy infrastructure businesses, g = 2.5 per cent, while for the market g = 4.6 per cent, the average of the DGM estimates of the energy infrastructure businesses is 15.0 per cent, significantly higher than the DGM estimate for the market, which is 11.0 per cent.

A DGM relies on strong assumptions, and if these fail to hold it may potentially generate erroneous results. First, it makes assumptions about the term-structure of the discount rate. Second, even a multi-stage model must make assumptions about the trajectory of expected future dividends. Third, it assumes that at each point of time the price of equity equals its fair value. We judge that the DGM estimates generated for the five energy infrastructure businesses are implausible. Moreover, a benchmark average of these DGM estimates may potentially be excessively variable over time.[632]

We judge that the DGM estimates of the return on equity of the market are more plausible. As these estimates are informed by data for 200 companies, idiosyncratic data for individual companies have a minimal effect on the estimates. Accordingly, since 2006, the DGM estimate for return on equity for the market is significantly more stable than the estimates for the five energy infrastructure businesses.

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[632]    The potential variability in DGM estimates is noted in the Brattle Group report: 'because stock prices (and to a degree forecasted growth rates) change frequently, the model results often vary substantially over time' (Brattle Group, Estimating the Cost of Equity for Regulated Companies: Prepared for APIA, 17 February 2013, p. 31).

# I    Return on debt: weighting schemes

This appendix outlined the results of our analysis of different weighting schemes for the trailing average portfolio approach.

The following analysis is based on the Bloomberg BBB fair value curve (FVC) seven–year yields from 4 December 2001 to 1 August 2013. We have computed a series of seven–year trailing averages using, as the averaging period, the same calendar month for each included year. For example, the December 2007 trailing average was computed as a weighted sum of average yields for December 2001, December 2002, …, December 2007.

We have calculated trailing averages using two different weighting schemes: simple (equal) weights and increasing weights. In the latter case, we have assumed that the weights increased at a constant rate $g$ from one year to the next. Intuitively, such a weighting scheme would attempt to match debt balances growing at the yearly rate $g$—due to, for example, increasing capex.

Mathematically,

- $TA_t^w = w_1 \cdot y_{t-6} + w_2 \cdot y_{t-5} + w_3 \cdot y_{t-4} + w_4 \cdot y_{t-3} + w_5 \cdot y_{t-2} + w_6 \cdot y_{t-1} + w_7 \cdot y_t$

where:

- $TA_t^w$ is the trailing average computed for year $t$ using weighting scheme $w$

- $w_1, w_2, …, w_7$ are the weights for different years within the trailing average

- $y_{t-6}, y_{t-5}, …, y_t$ are the seven-year yields corresponding to years $t$-6, $t$-5, …, $t$ and computed based on the assumed averaging periods and the underlying BBB Bloomberg FVC data

Then, with the simple weights, all weights are equal to 1/7, and:

- $TA_t^{simple} = \frac{1}{7} \cdot (y_{t-6} + y_{t-5} + y_{t-4} + y_{t-3} + y_{t-2} + y_{t-1} + y_t)$

With the increasing weights:

- $w_7 = (1 + g) \cdot w_6$

- $w_6 = (1 + g) \cdot w_5$

and so on; and:

- $w_1 + w_2 + w_3 + w_4 + w_5 + w_6 + w_7 = 1$

For illustrative purposes, we have reported the differences between trailing averages using increasing weights and those using simple weights in Table I.6 to Table I.8. Each column in these tables refers to the month that we have selected as the averaging period. Each row refers to the last year included in each trailing average.

We have provided three examples corresponding to a $g$ of 5 per cent a year, 10 per cent per year and 20 per cent per year. Our analysis demonstrates that for each column the differences between the two weighting schemes can take both negative and positive values. Further, for a growth rate $g$ of zero, the two weighting schemes would be identical. The difference between the two approaches increases with the value of $g$. In particular, the discrepancy between the trailing average with

increasing weights and the simple trailing average is largest in Table I.8, which corresponds to a 20 per cent annual growth rate of debt balances. The differences between the two schemes range from –0.08 to 0.12 per cent in Table I.6, from –0.17 to 0.23 per cent in Table I.7, and from –0.33 to 0.43 per cent in Table I.8.

**Table I.6**       **Differences between trailing average with weights increasing at a rate g = 0.05 and simple weighted trailing average (per cent)**

| Year/Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2007 | | | | | | | | | | | | 0.03 |
| 2008 | 0.03 | 0.04 | 0.05 | 0.05 | 0.05 | 0.07 | 0.06 | 0.05 | 0.05 | 0.04 | 0.04 | 0.03 |
| 2009 | 0.05 | 0.06 | 0.07 | 0.07 | 0.08 | 0.10 | 0.09 | 0.07 | 0.08 | 0.09 | 0.07 | 0.07 |
| 2010 | 0.08 | 0.09 | 0.09 | 0.09 | 0.09 | 0.10 | 0.09 | 0.08 | 0.10 | 0.11 | 0.11 | 0.12 |
| 2011 | 0.11 | 0.12 | 0.11 | 0.11 | 0.10 | 0.09 | 0.08 | 0.07 | 0.07 | 0.07 | 0.06 | 0.06 |
| 2012 | 0.06 | 0.06 | 0.06 | 0.04 | 0.02 | 0.00 | –0.01 | –0.01 | –0.02 | –0.02 | –0.02 | –0.02 |
| 2013 | –0.03 | –0.03 | –0.04 | –0.06 | –0.07 | –0.08 | –0.08 | | | | | |

Source:    Bloomberg, AER analysis.

**Table I.7**       **Differences between trailing average with weights increasing at a rate g = 0.1 and simple weighted trailing average (per cent)**

| Year/Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2007 | | | | | | | | | | | | 0.06 |
| 2008 | 0.07 | 0.09 | 0.10 | 0.10 | 0.10 | 0.13 | 0.13 | 0.10 | 0.11 | 0.09 | 0.07 | 0.07 |
| 2009 | 0.09 | 0.11 | 0.13 | 0.13 | 0.15 | 0.20 | 0.18 | 0.15 | 0.17 | 0.18 | 0.15 | 0.15 |
| 2010 | 0.16 | 0.17 | 0.18 | 0.18 | 0.18 | 0.20 | 0.18 | 0.16 | 0.19 | 0.21 | 0.21 | 0.23 |
| 2011 | 0.22 | 0.22 | 0.21 | 0.21 | 0.19 | 0.18 | 0.15 | 0.12 | 0.13 | 0.13 | 0.12 | 0.11 |
| 2012 | 0.12 | 0.11 | 0.10 | 0.07 | 0.04 | 0.00 | –0.02 | –0.03 | –0.04 | –0.05 | –0.05 | –0.05 |
| 2013 | –0.06 | –0.07 | –0.09 | –0.12 | –0.14 | –0.17 | –0.16 | | | | | |

Source:    Bloomberg, AER analysis.

**Table I.8    Differences between trailing average with weights increasing at a rate g = 0.2 and simple weighted trailing average (per cent)**

| Year/Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2007 | | | | | | | | | | | | 0.13 |
| 2008 | 0.14 | 0.19 | 0.21 | 0.20 | 0.20 | 0.27 | 0.26 | 0.20 | 0.22 | 0.17 | 0.14 | 0.13 |
| 2009 | 0.17 | 0.21 | 0.24 | 0.25 | 0.28 | 0.38 | 0.33 | 0.28 | 0.32 | 0.35 | 0.29 | 0.28 |
| 2010 | 0.30 | 0.32 | 0.35 | 0.34 | 0.34 | 0.38 | 0.33 | 0.30 | 0.36 | 0.40 | 0.40 | 0.43 |
| 2011 | 0.42 | 0.42 | 0.38 | 0.38 | 0.36 | 0.32 | 0.27 | 0.22 | 0.23 | 0.23 | 0.20 | 0.20 |
| 2012 | 0.20 | 0.20 | 0.17 | 0.12 | 0.04 | -0.03 | -0.06 | -0.07 | -0.10 | -0.13 | -0.13 | -0.13 |
| 2013 | -0.14 | -0.16 | -0.19 | -0.25 | -0.29 | -0.33 | -0.32 | | | | | |

Source:    Bloomberg, AER analysis.

# J    Return on debt: transition

This appendix diagrammatically shows how the transition to the proposed trailing average portfolio approach to return on debt estimation would work.

Each of the seven diagrams below refers to one year of transition. The green horizontal bars correspond to the original debt portfolio of the benchmark efficient entity under the 'on the day' approach. This debt portfolio includes only debt maturing in seven years. The blue horizontal lines correspond to new debt issued by the benchmark efficient entity during the transition. Each horizontal blue and green line accounts for one-seventh of the total debt portfolio.

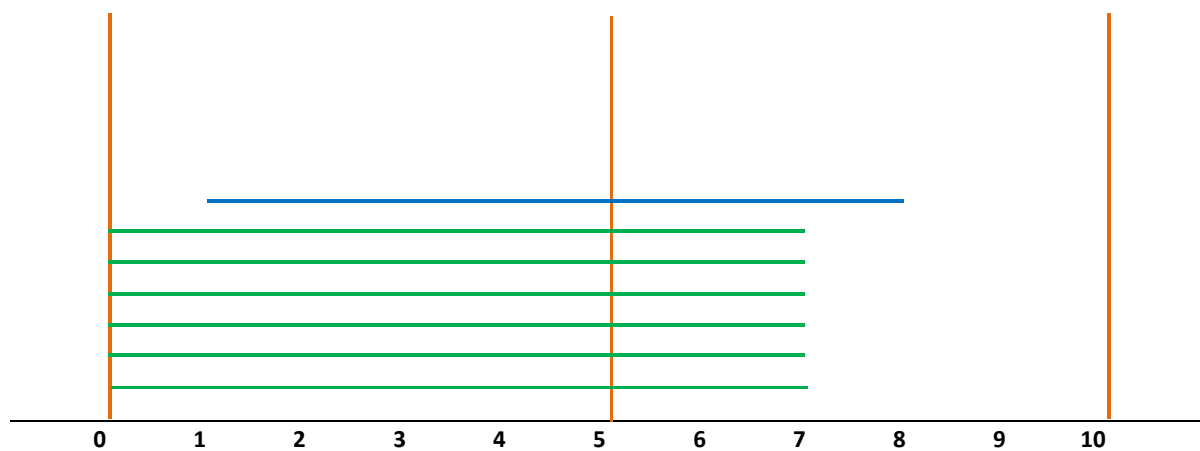The allowed return on debt in the first year is the prevailing rate.

**Figure J.11    Transition, year one**
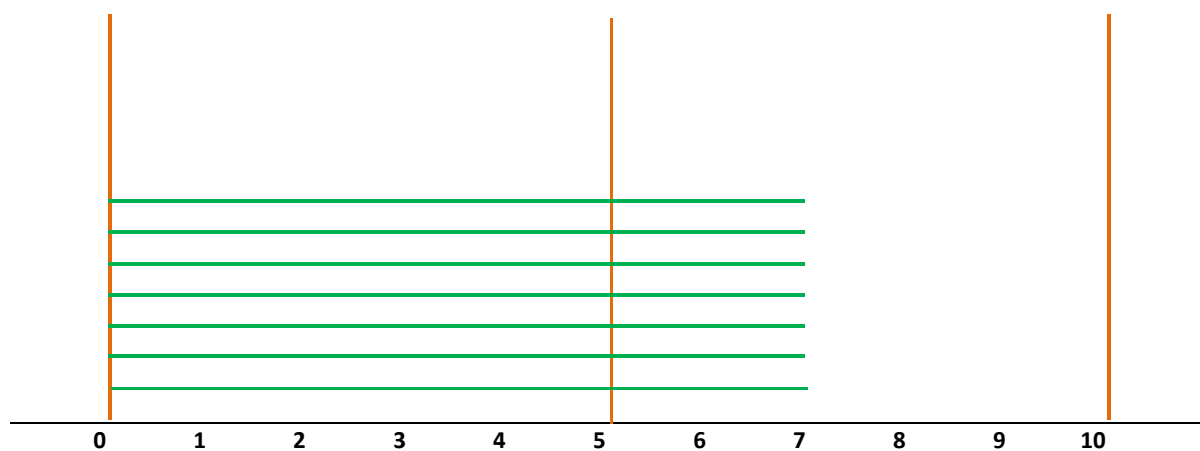


Source:    AER analysis.

In the second year, the benchmark efficient entity retires one-seventh of the debt it issued in the first year and replaces it by newly issued seven-year debt. After this has occurred, the allowed return on debt is a weighted sum of the prevailing rates in the first and second years (with weights of 6/7 and 1/7, respectively).
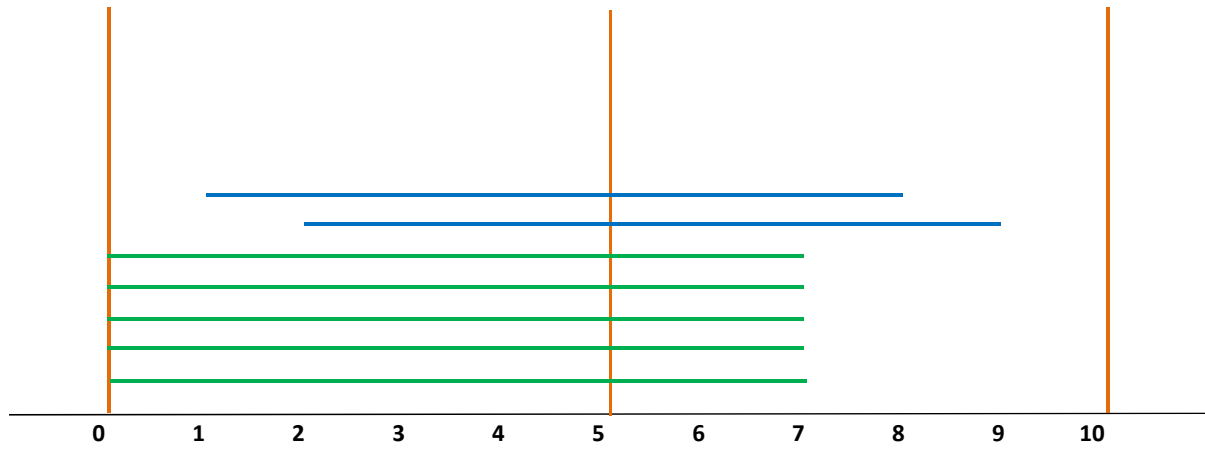
**Figure J.12    Transition, year two**
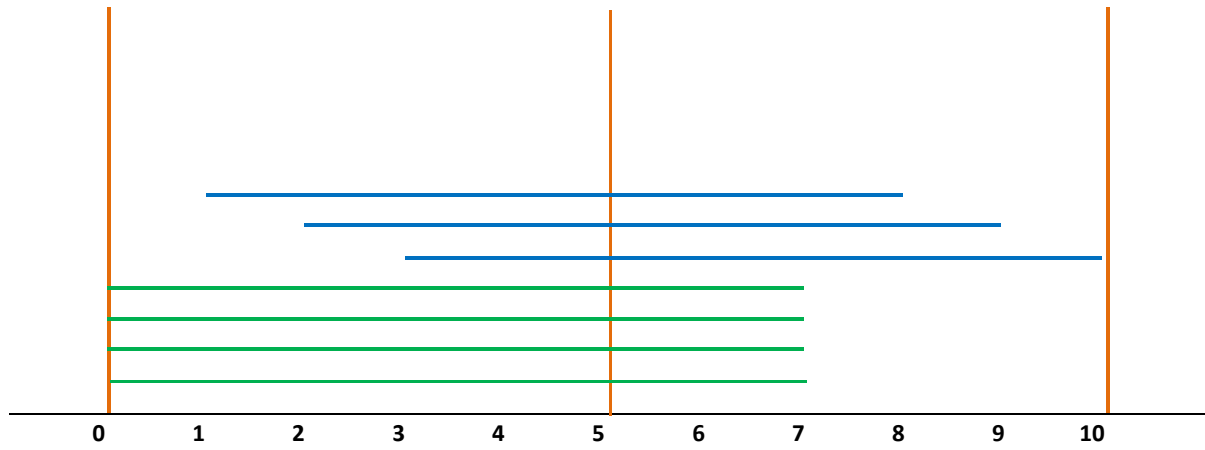


Source:    AER analysis.

In the third and subsequent years of the transitional period, the benchmark efficient entity retires another one-seventh of the debt it issued in the first year and replaces it with newly issued seven-year debt.
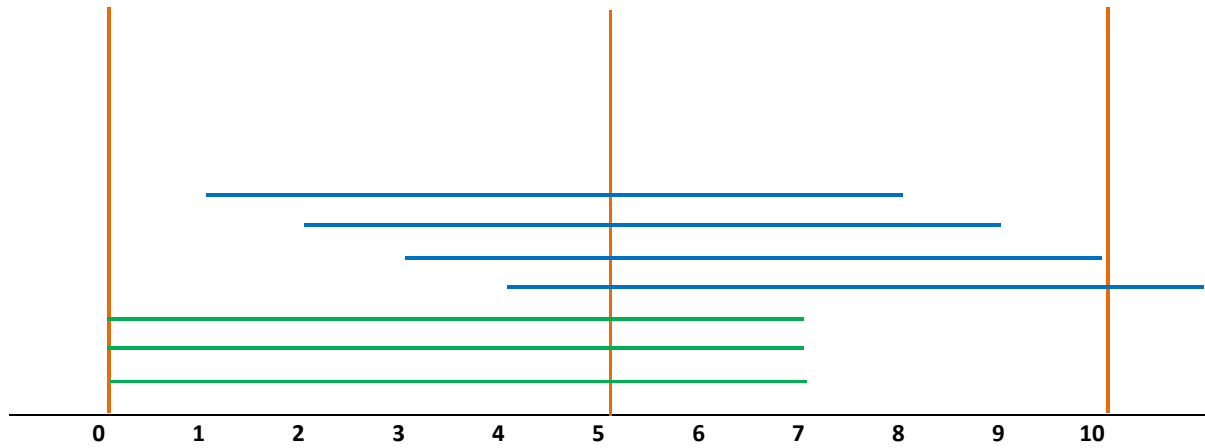
**Figure J.13    Transition, year three**



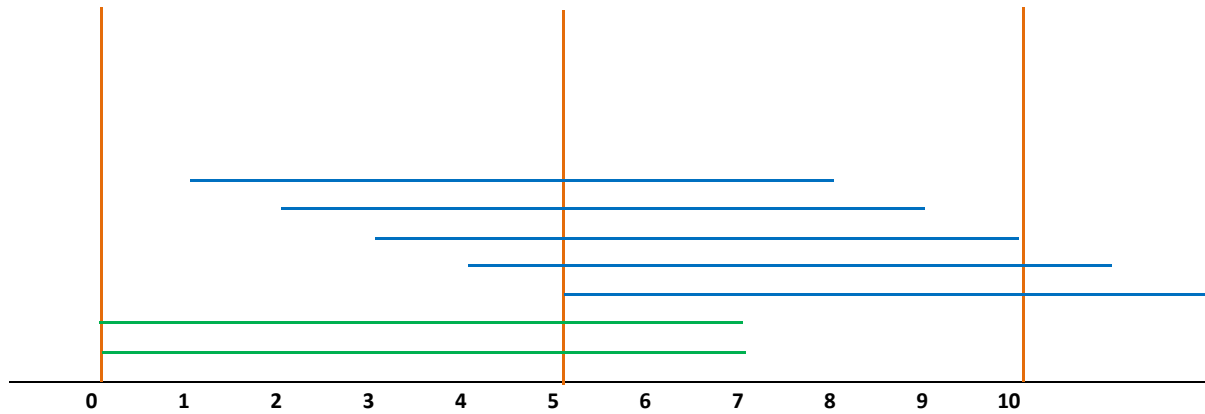Source:    AER analysis.

**Figure J.14    Transition, year four**



Source:    AER analysis.

**Figure J.15    Transition, year five**



Source:    AER analysis.

**Figure J.16    Transition, year six**



Source:    AER analysis.

In the seventh year, the benchmark efficient entity replaces another one-seventh of the debt it issued in the first year with newly issued seven-year debt. The allowed return on debt in the seventh year is an equally weighted (with weights of 1/7) sum of the prevailing rates in the seven years of transition. The transition is complete.

**Figure J.17    Transition, year seven**
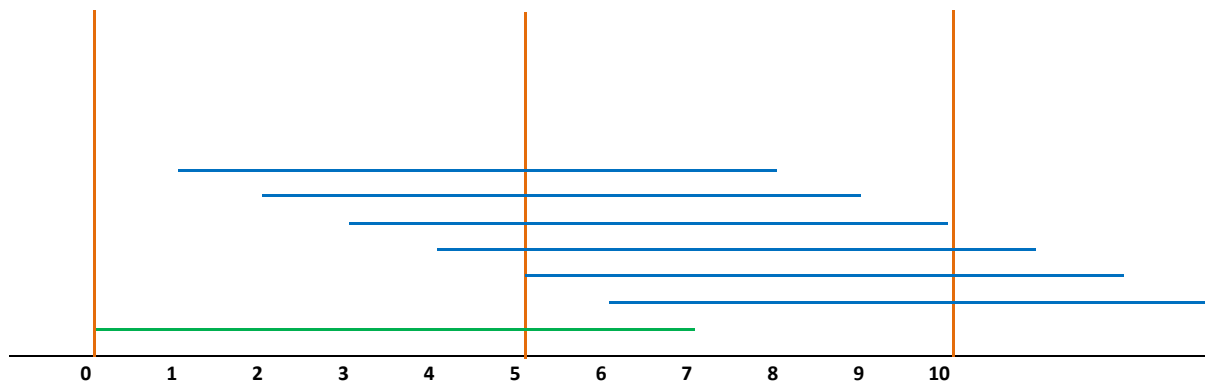


Source:    AER analysis.

# K Imputation credits

This appendix includes further detailed analysis of issues raised in chapter 8. Specifically, it includes:

- analysis of the Officer framework

- Tribunal commentary on estimating the value of imputation credits

- resident investor classes eligible to redeem imputation credits

- the payout ratio—detailed analysis of the NERA study

- the utilisation rate—tax statistic estimates

- the utilisation rate—implied market value studies.

## K.1 Analysis of the Officer framework

In section 8.3.1 of the imputation credit chapter, we set out the conceptual framework linking imputation credits with the regulatory framework. An important part of that link is the Officer (1994) framework. In this section, we set out an expanded analysis of how Officer (1994) defines the cash flows.

In his paper deriving the CAPM under imputation, Officer defines the distribution of a firm's operating income as:[633]

$$X_o = X_G + X_D + X_E \ \text{(equation 1)}$$

where:

- $X_O$ is operating income

- $X_G$ is income distributed to the government as tax

- $X_D$ is income distributed to debtors as interest payments

- $X_E$ is income distributed to equity holders

Then, under an imputation tax system, Officer defines the income paid to the government as the tax that a company pays, minus some proportion of this paid back to equity holders.[634]

$$X_G = T(X_o - X_D)(1 - \gamma) \quad \text{(equation 2)}$$

where:

- $\gamma$ is the value of imputation credits

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[633] R. R. Officer, 'The cost of capital of a company under an imputation tax system', *Accounting and finance*, Vol. 34, Iss. 1, May 1994, p. 3.

[634] R. R. Officer, 'The cost of capital of a company under an imputation tax system', *Accounting and finance*, Vol. 34, Iss. 1, May 1994, p. 4.

This mirrors the rule for estimating the cost of corporate income tax in the building block framework.[635] Table K.9 compares the cost of corporate income tax provisions in the NER and NGR with the elements in equation 2.

**Table K.9    Comparison of the Officer tax cash flow and the building block provision governing the cost of company income tax.**

| Rules formula | Officer formula | Description |
|---|---|---|
| Estimated taxable income (ETIt) | $(X_O - X_D)$ | An estimate of the revenue on which a firm will have to pay tax. Interest payments are subtracted from operating income because they are a tax deductible expense. |
| Expected company income tax rate ($r_T$) | T | The prevailing tax rate used to calculate the company's tax liability. |
| Adjustment for the value of imputation credits $(1-\gamma)$ | $(1-\gamma)$ | This calculation reduces the total tax paid to recognise the company tax which is then distributed to investors via the utilisation of imputation credits. |

Source:    AER analysis.

So, Officer then substitutes equation (2) into equation (1) to derive the distribution of operating income showing the role of imputation credits.[636]

$$X_o = T(X_o - X_D)(1 - \gamma) + X_D + X_E \text{ (equation 3)}$$

Officer also clarifies that in this formulation, the equity holders' share of operating income ($X_E$) is the sum of dividend payments, plus the proportion of tax that is distributed back to shareholders.[637]

$$X_E = X_{E'} + \gamma T(X_o - X_D) \text{ (equation 4)}$$

where:

- $X_{E'}$ is income distributed through dividend payment to investors

- $\gamma T(X_O - X_D)$ is income distributed through imputation credits to investors.[638]

So, to capture the full life cycle of tax cash flows:

- The company pays tax to the government: $T(X_O - X_D)$

- The government keeps some of this tax: $(1-\gamma) T(X_O - X_D)$

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635    NGR, r. 87A; NER, cl. 6.5.3 and NER, cl. 6A.6.4.
636    R. R. Officer, 'The cost of capital of a company under an imputation tax system', *Accounting and finance*, Vol. 34, Iss. 1, May 1994, p. 5.
637    R. R. Officer, 'The cost of capital of a company under an imputation tax system', *Accounting and finance*, Vol. 34, Iss. 1, May 1994, p. 4.
638    Note, this is equal to the adjustment to company tax.

- But some of it goes back to equity holders: (γ) $T(X_O - X_D)$

In total, this ensures that all operating income earned by the company then flowing through the imputation tax system is accounted for.

The only part of the tax cash flows that the government keeps (before personal tax) is the $(1-\gamma)$ portion. This portion represents the tax paid by companies, less any tax returned to investors by the government when imputation credits are redeemed. The proportion (γ) is the proportion of company tax paid that investors redeem. Under this definition of operating cash flows, the reduction in company taxes paid to the government must be equal to the value of imputation credits investors expect to redeem.

## K.2 Tribunal commentary on estimating the value of imputation credits

In section 8.1 of the imputation credit chapter, we discuss the background of imputation credits in Australian regulation. In 2011, we applied a gamma of 0.65 in the Queensland and South Australian electricity distribution determinations. Energex and Ergon successfully sought Tribunal review of this decision by the Tribunal. The Tribunal set the payout ratio to 0.7 and commissioned a divided drop off study from SFG.[639] The Tribunal adopted SFG's recommendation that the utilisation rate be set at 0.35. This resulted in a gamma of 0.25.

In reaching its position, the Tribunal expressed views on the important factors in its decisions. We have carefully considered these views in reaching our proposed position. This included areas where the Tribunal felt its understanding was incomplete. For reference, Table K.10 summarises these views.

**Table K.10      Summary of the Tribunal's views on gamma issues**

| Issue | Tribunal commentary (quotes sourced from review) |
|---|---|
| The conceptual framework for gamma | 'The Tribunal has found some deficiencies in its understanding of the foundations of the task facing it, and the AER, in determining the appropriate value of gamma. These issues have not been explored so far because they have not arisen between the parties, who appear to be in agreement about how the Rules should be interpreted regarding the treatment of corporate income tax. They may be matters that the Tribunal will take up in its further decision in these matters; or they may best be left until the next WACC review. Indeed, they may go to the basis for the Rules themselves. <br><br> The Tribunal would be assisted in its consideration of the issues before it if the AER were to provide relevant extrinsic material explaining: <br><br> (a) the rationale for including the gamma component in the formula for calculating the estimated cost of corporate income tax; and <br><br> (b) how it relates to the rest of the building blocks, especially the rate of return (cl 6.4.3(a) and cl 6.5.2(b) of the Rules).'[640] |
| The payout ratio | 'The AER accepts that on the material presently before the Tribunal, there is no empirical data that is capable of supporting an estimated distribution ratio higher than 0.7.'[641] |

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[639] Australian Competition Tribunal, *Application by Energex Limited (No 2) [2010] AComptT 7*, October 2010, para. 147.
[640] Australian Competition Tribunal, *Application by Energex Limited (No 2) [2010] AComptT 7*, October 2010, paras. 149–150.
[641] Australian Competition Tribunal, *Application by Energex Limited (Distribution Ratio (Gamma)) (No 3) [2010] AComptT 9*, December 2010, para 2.

| | |
|---|---|
| Tax value studies | 'A question remains whether dividend drop-off studies are able to provide appropriate estimates for the purposes of the Rules; and whether the results of SFG's March 2011 report should be considered in the light of other approaches. This issue is addressed in the AER's report and in SIRCA's March 2011 report.<br><br>SIRCA's March 2011 report provided responses to a number of specific questions asked by the AER. Some of these responses raise serious issues regarding the use of dividend drop-off studies and the Tribunal's earlier reasons. For example, SIRCA's March 2011 report suggests that:<br><br>- estimates from dividend drop-off studies are very imprecise and of questionable reliability;<br><br>- such studies are likely to produce downwardly-biased estimates of theta; and<br><br>- taxation studies do not give an upper bound to theta.<br><br>By way of background, the Tribunal in earlier reasons noted that the AER accepted that tax statistics studies provide an upper bound on possible values of theta. The AER in its report, while being less unequivocal than SIRCA, adopts SIRCA's suggestion that the results of tax statistics studies (now called the redemption rate) could be discounted for factors such as the time between the distribution and the redemption of imputation credits. These adjustments "would need to be made on an economically justifiable basis". The AER referred to a 2004 study by Hathaway and Officer as being an example of such a use of an estimate of the utilisation rate.<br><br>Beyond these observations, the AER does not seek to adduce material from SIRCA's March 2011 report to advance its submissions. On the material before it, the Tribunal is unable to reach any conclusions about the further use of tax statistics studies in estimating the utilisation ratio, theta. No doubt the AER will in the future have opportunity, and perhaps cause, to investigate further. It has not sought to do so in these proceedings.'[642] |
| The conceptual basis for dividend drop off studies | 'The AER has tendered, largely without comment, material that casts some doubt on the use of dividend drop-off studies in estimating gamma for regulatory purposes. In responding to questions from the AER, SIRCA's March 2011 report raises questions about the theoretical basis for dividend drop-off studies. In doing so, it touches on issues raised in the Tribunal's earlier reasons regarding the arbitrage model underlying dividend drop-off studies.<br><br>However, SIRCA's March 2011 report does not resolve these issues and the AER has provided no conclusions of its own.'[643] |

Source:     As specified in table.

## K.3     Resident investor classes eligible to redeem imputation credits

In section 8.3.2 of the imputation credit chapter, we discuss the process by which investors receive and redeem imputation credits. As part of this explanation, we give a high-level summary of which investors are eligible to redeem imputation credits. A more detailed list of resident investor classes eligible to redeem imputation credits follows: [644]

▪ individuals who receive franked dividends, either directly or through a trust or partnership

▪ trustees liable to be assessed under section 99 (but not sections 981 or 99A) of the Income Tax Assessment Act 1936 (ITAA 1936)

▪ complying superannuation funds

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[642]   Australian Competition Tribunal, *Application by Energex Limited (No 5) [2011] AComptT 9*, May 2011, paras. 31–33.
[643]   Australian Competition Tribunal, *Application by Energex Limited (No 5) [2011] AComptT 9*, May 2011, paras. 40–41.
[644]   ATO, *Refunding imputation credits: Overview*, Available at: http://www.ato.gov.au/Business/Imputation/In-detail/Refunding-imputation-credits--Overview/

- complying approved deposit funds (ADFs)

- life insurance companies and registered organisations (in respect of their superannuation business)

- pooled superannuation trusts (PSTs)

- endorsed income tax exempt charities and deductible gift recipients.

## K.4 Payout ratio—analysis of NERA study

In section 8.4.4 of the imputation credit chapter, we propose to use the cumulative payout ratio calculated from tax statistics to estimate the payout ratio. With current data, this suggests a payout ratio of 0.7. In particular, we consider the cumulative payout ratio method that NERA submitted in its report to the ERA is reasonable.

The NERA report submits that the cumulative payout ratio from 1987–88 to 2010–11 (which is the most recent year for which tax data is available) is the most reliable estimate of the payout ratio.[645] This is because:

- it is less susceptible to fluctuations in annual data than the alternative annual measures of the payout ratio

- the two approaches to estimate the annual payout ratio (tax approach and dividend approach) produce significantly different estimates. It is unclear why this happens.

NERA's estimate is calculated by dividing the total franking account balance at the end of 2010–11 (most recent data available) by the total value of Australian company tax paid from 1987–88 to 2010–11 (since commencement of the imputation system). The payout ratio is 1 minus this proportion. The intuition of NERA's approach is that:

1. the total franking account balance (1) should pick up all credits that have been generated but not distributed

2. the total net company tax paid over this time period (2) is the same as the total value of imputation credits generated

3. so, dividing (1) by (2) gives an estimate of franking credits that have not been distributed as a proportion of franking credits that all companies have generated.

Then, by subtracting this proportion from 1, the output is an estimate of all franking credits that have been distributed as a proportion of franking credits that all companies have generated. We consider this is a reasonable approach to estimate the payout ratio. In particular, we consider it is simple, fit for purpose, transparent, replicable and based on reliable and publicly accessible data sets.

### Evidence of a rising payout ratio

In the consultation paper, we identified an expectation that the payout ratio may rise over time in response to tax reforms in 2000.[646] Since 2001, investors are guaranteed full compensation for

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[645] ENA, *Response, Attachment 12: The Payout Ratio*, NERA, June 2013, p 11.
[646] AER, *Rate of return consultation paper*, May 2013, pp. 129–130.

imputation credits, even where those credits exceed the investors' tax liabilities.[647] We proposed that this would make imputation credits more valuable to investors, and in turn would increase the incentive for firms to distribute franking credits. In response, NERA submitted that there is no evidence to suggest the payout ratio is rising.[648] At this stage, we accept that 0.7 remains a reasonable estimate of the cumulative payout ratio. However, we consider there is some evidence that the payout ratio may be rising over time. In particular:

- The cumulative payout ratio over 2002–03 to 2010–11 is higher than 0.7—using the same data-set as NERA, we can recalculate a cumulative payout ratio since 2002–03. To do so, we replace the total franking account balance at the end of 2010–11 with the change in the franking account balance from 2002–03 to 2010–11. This leads to an estimate of 0.73.[649] However, for reasons outlined in NERA's report,[650] there are problems with putting heavy emphasis on recent tax data. This is because the ATO often adjusts tax data for several years after its release. By shortening the sample period, it increases the weight on these recent years, which may yet be adjusted significantly. For this reason, we will not at present rely on this more recent estimate to set the payout ratio. However, we expect to revisit this data in future reviews of the payout ratio.

- Further, Abraham finds that 'firms were also more likely to distribute franking credits subsequent to the July 2000 tax reforms'.[651] This analysis refers to the number of firms that distribute imputation credits, rather than the proportion of credits that the market distributes. However, we have no evidence to suggest that firms that previously paid imputation credits are reducing their payout ratios. Therefore, holding other things constant, growth in the number of firms distributing imputation credits suggests that distribution of imputation credits has become more attractive to companies and investors since the tax reforms. Nonetheless, we acknowledge that this is indirect evidence on movements in the market-wide payout ratio and therefore we are cautious in drawing strong conclusions from it.

## K.5    Utilisation rate—tax statistic estimates

In section 8.4.5 of the imputation credit chapter, we discuss the potential role of tax statistic estimates in estimating the value of the utilisation rate. This section sets out more detailed technical analysis of the available tax statistic estimates, and the strengths and weaknesses of this approach. Tax statistic estimates are a way to estimate the utilisation of imputation credits. The utilisation rate is the proportion of distributed credits that investors redeem to reduce their tax liabilities.

Table K.11 sets out the available tax statistic estimates.

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[647]    ATO, *Refunding imputation credits: Overview*, Available at: http://www.ato.gov.au/Business/Imputation/In-detail/Refunding-imputation-credits--Overview/

[648]    ENA, *Response, Attachment 12: The Payout Ratio*, NERA, June 2013, p 13.

[649]    The total net tax paid over this period is approximately $452.96 billion, and the change in the franking account balance is approximately $122.33 billion. The ratio is calculated as 1 – (122.33/452.96). For data, see: ATO, *Taxation statistics 2010–11—Table 1: Company tax selected items for income years 1979–80 to 2010–11*, Available at: http://www.ato.gov.au/About-ATO/Research-and-statistics/In-detail/Tax-statistics/Taxation-statistics-2010-11/?default=&page=9#Company_tax_and_the_petroleum_resource_rent_tax

[650]    ENA, *Response, Attachment 12: The Payout Ratio*, NERA, June 2013, p 10.

[651]    M. Abraham, 'Tax refund for unused franking credits and shareholder pattern change: Australian evidence', International journal of social and behavioural sciences, Vol. 1, Iss. 1, January 2013, pp. 14–15.

**Table K.11     Tax statistic estimates**

| Study | Sample period | Estimated value |
|---|---|---|
| Hathaway and Officer (2004)[652] | 1988–2002 | 0.45 |
| Handley and Maheswaran (2007)[653] | 1988–2000<br>2001–2004 | 0.67<br>0.81 |
| Hathaway (2010)[654] | 2004–2008 | 0.65 |

Source:    As specified in table.

In the 2009 WACC review, we relied on an average of the Handley and Maheswaran studies (0.67 and 0.81), giving a tax statistic estimate of 0.74.[655]

The potential advantages of tax statistic estimates are that:

▪ They are a close conceptual fit with the conceptual framework as set out in chapter 8. This is because tax statistics produce an estimate of the extent to which all investors have reduced effective company tax paid by redeeming imputation credits.

▪ They are an estimate from the only event where imputation credits are 'traded' separately. That is, it is only in tax returns that we can observe anything about franking credits unattached from dividend payments. This avoids the 'allocation problem', which is discussed in the section on dividend drop off studies.

▪ Measurement of the redemption rate is not confounded by the effects of market movements that are not associated with the value of imputation credits, whereas market value studies are sensitive to this problem.

▪ They use a comparatively simple and replicable method and, assuming the underlying ATO data is reliable, have fewer econometric shortcomings than market value studies.

However, tax statistic estimates as a class of evidence do have some weaknesses. Addressing these weaknesses, Hathaway published a critique of the Handley and Maheswaran tax statistic estimates, concluding that tax statistics should not be used to estimate the utilisation rate.[656] Professor Handley then published detailed responses to these criticisms and maintained that tax statistic estimates could validly be used to estimate the utilisation rate.[657] However, we consider some of Hathaway's concerns may be valid. In particular, there is a currently irreconcilable difference between the implied distribution of franking credits (credits received) calculated using franking account balances, and the net distribution compiled from ATO company income and financial data. Through the guideline process, we will work to better understand and resolve these issues.

We are also aware that the Handley and Maheswaran study may not fully take into account the impact of the 45 day holding rule. Specifically, the measure used for credits received (the

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[652]    N. Hathaway and B. Officer, *The value of imputation tax credits—Update 2004, Capital research Pty Ltd report*, November 2004.

[653]    J.C. Handley and K. Maheswaran, 'A measure of the efficacy of the Australian imputation tax system', The economic record, Vol. 84, No. 264, March 2008, p. 90

[654]    N. Hathaway, *Imputation credit redemption: ATO data 1988–2008, Capital research Pty Ltd report*, July 2010, p. 7,

[655]    AER, *Final decision: WACC review*, May 2009, p. 467.

[656]    N. Hathaway, *Comment on: "A measure of the efficacy of the Australian imputation tax system by John Handley and Krishan Maheswaran"*, July 2010.

[657]    D.L. Handley, *Further issues relating to the estimation of gamma*, October 2010, pp. 21–34.

denominator) does not include those credits distributed to investors who do not hold shares for the entire 45 day period because they are not required to declare receipt of the credit in their tax returns. As a result, the Handley and Maheswaran study may somewhat overstate the true redemption rate. However, McKenzie and Partington suggest that while the amount of imputation credit 'wastage' due to the 45 day holding rule is unknown, it is unlikely to be large.[658]

## K.6 Utilisation rate—implied market value studies

In section 8.4.5 of the imputation credit chapter, we discuss the potential role of implied market value estimates in estimating the value of the utilisation rate. In particular, we identify that while implied market value estimates have some potential advantages, the problems with these estimates and the wide range of expert conclusions make it difficult to select a definitive value from the range. This section sets out more detailed technical analysis of the available implied market value estimates, and the strengths and weaknesses of the approaches.

The current estimate of the utilisation rate (0.35) comes from a single dividend drop off study.[659] Dividend drop off studies are part of a broader class of implied market value studies. The value from these studies is an 'implied' value because the imputation credit is never separately observable and there is no direct market for imputation credits. So, the value must be estimated or implied from the movements in security prices, and then separated from the value of attached dividends. In this section, we present the wide range of dividend drop off studies and alternative market value studies that have been conducted, together with observations about the strengths and weaknesses of the various approaches. Taken together, we observe that there is no definitive study, and that all of the published implied market value studies by respected academic professionals are subject to:

- Econometric problems that experts have not been able to resolve. Further, we consider some of these problems are inherent in the methodologies, and possibly cannot be resolved.

- High sensitivity to subtle variations in method, time-period and data-set.

- To this effect, McKenzie and Partington (2010) observe that:[660]

    It is clear that a precise and unambiguous valuation of theta is unlikely to be derived from traditional ex-dividend studies. It would be unwise, therefore, to rely on one ex-dividend study to determine theta (the utilisation rate). Equally, it would be unwise to just rely on combining results across several ex-dividend studies; triangulation with other evidence is desirable.

- As a result, we consider that good regulatory practice suggests that we should not rely exclusively on any one of these studies, or only on these studies. Taken as a body of evidence, there are studies suggesting an implied utilisation rate between zero (no value) to greater than one (face value). The estimate from the equity ownership approach and tax statistic estimates lie within the range of estimates from implied market value studies. As a result, we consider that the range of implied market value studies studies neither suggest nor rule out any other single estimate of the utilisation rate.

In this section, we discuss:

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[658] M. McKenzie and G. Partington, *Report to the AER: Response to questions related to the estimation and theory of theta*, March 2011, p. 16.

[659] SFG, *Dividend drop off estimate of theta: Final report—Re: Application by Energex Limited (No 2)[2010]ACompT7*, March 2011, p. 3.

[660] M. McKenzie and G. Partington on behalf of the Securities Industry Research Centre of Asia Pacific (SIRCA) Pty Ltd, *Report to the AER—Evidence and submissions on gamma*, March 2010, p. 11.

- dividend drop off studies

- alternative implied market value studies.

## K.6.1 Dividend drop off studies

Along with taxation studies, dividend drop off studies are the other common approach used to estimate the utilisation rate. The current estimate of the utilisation rate (0.35) is based on SFG's 2011 dividend drop off study that the Tribunal commissioned. These studies are calculated by comparing share prices between:

- the cum-dividend date—the last day on which investors owning shares will be eligible to receive dividends and the attached franking credits

- the ex-dividend date—the first day on which investors owning shares will not be eligible to receive dividends and attached franking credits.

That is, an investor that buys a share on the cum-dividend date will be eligible to receive a dividend from that company. In theory, an investor who buys a share on the ex-dividend date will not. The difference in these prices should therefore reflect the investors' valuation of the combined package of dividends and franking credits, all other things being equal. Often, dividend drop-off studies will report this as a dividend drop off ratio. This is the reduction in the share price as a proportion of the face value of dividends paid out.

Table K.12 sets out the range of relevant dividend-drop off studies.[661]

**Table K.12      Dividend drop-off studies**

| Study | Estimated value/range of theta | Comments |
|---|---|---|
| Brown and Clarke (1993)[662] | 0.80 | Estimated yearly annual drop off ratios |
| Bruckner, Dews and White (1994)[663] | 0.69 | Using data from 1991–1993. |
| Hathaway and Officer (2004)[664] | 0.49 | Using data between August 1986 and August 2004. The observations were partitioned by market capitalisation (large, mid, small). Find that the results vary by market capitalisation, against expectations of the authors. |
| Bellamy and Gray (2004)[665] | 0.36 (0 to 0.6) | The authors use a simulation exercise to support an optimal model specification. They find results between 0 to 60 per cent depending on this specification, and recommend 0.36. |
| Beggs and Skeels (2006)[666] | 0.57 | The AER relied on this estimate in the |

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[661]    That is, dividend drop-off studies for the Australian market under an imputation tax system.
[662]    P. Brown and A. Clarke, 'The ex-dividend day behaviour of Australian share prices before and after dividend imputation', *Australian journal of management*, June 1993, Vol. 18, p. 34.
[663]    P. Bruckner, N. Dews and D. White, 'Capturing Value from Dividend Imputation: How Australian Companies Should Recognize and Capitalise on a Major Opportunity to Increase Shareholder Value', *McKinsey and Company report*, 1994.
[664]    N. Hathaway and B. Officer, *The value of imputation tax credits—Update 2004, Capital research Pty Ltd report*, November 2004.
[665]    D.E Bellamy and S. Gray, 'Using stock price changes to estimate the value of dividend franking credits', *Working paper series: University of Queensland Business School*, March 2004.

| | | |
|---|---|---|
| | | WACC review. Professor Skeels subsequently endorsed the 2011 SFG study. |
| Truong and Partington (2006)[667] | 0.32–1.14 | Using a series of different regression model specifications for data from 1995 to 2005. This paper uses partitioning and filtering extensively. |
| SFG (2011)[668] | 0.35 | The Tribunal relied on SFG's study to set theta. At the time, the AER raised a number of concerns with SFG's study, but the Tribunal did not accept these concerns. |
| SFG (2013)[669] | 0.35 | SFG updated its 2011 study to include additional years of data. |
| ERA (2013)[670] | 0.35 – 0.55 | The ERA's study largely mirrors SFG's methodology and data-set, though the ERA tests other specifications and input assumptions for sensitivity. |

Source:     As specified in table.

The potential advantages of dividend drop off studies are:

- they are based on market transactions, and in theory should therefore identify the market clearing price around the time of dividend distribution.

- they should, if robustly executed, identify all of the factors that affect the value of the combined package of dividends and imputation credits to traders transacting around the time of dividend distribution.

In 2011, the Tribunal considered dividend drop off studies were the only approach to estimate theta in which it had confidence.[671] However, at the time, the Tribunal noted that the conceptual framework for the task of estimating the value of imputation credits remained unclear. We are now in a significantly better position of conceptual understanding from which to draw conclusions about the appropriate use of various sources of evidence. Having done so, we consider the empirical problems in performing dividend drop off studies are such that they are unlikely to achieve these potential advantages. These problems can be broadly classified into three groups:

- problems with trading around the cum-dividend/ex-dividend dates

- the allocation problem

- other econometric issues.

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[666]   D.J. Beggs and C.L. Skeels, 'Market arbitrage of cash dividends and franking credits', The economic record, Vol. 82, pp. 239–252.

[667]   G. Truong and G. Partington, 'The value of imputation tax credits and their impact on the cost of capital', *Accounting and finance association of Australia and New Zealand Conference,* 2006.

[668]   SFG, *Dividend drop-off estimate of theta*, March 2011.

[669]   ENA, *Response to the AER's rate of return guidelines consultation paper, Attachment 13: Updated dividend drop-off estimate of theta*, SFG, 28 June 2013.

[670]   Economic Regulation Authority, *Explanatory statement for the draft rate of return guidelines: Meeting the requirements of the National Gas Rules*, August 2013, pp. 201–205.

[671]   Australian Competition Tribunal, *Application by Energex Limited (Gamma) (No 5) [2011] ACompT 9*, May 2011, para. 38.

## Problems with trading around the cum-dividend/ex-dividend dates

We consider that investors trading around the time of dividend distributions are unlikely to approximate the 'representative investor'. We reach this conclusion because there is significant evidence suggesting that trading around the ex-dividend day is not representative of the rest of the year.[672] For example, McKenzie and Partington observe that:[673]

> … the abnormal trading about the ex-dividend date, as evidenced for example by the cum-dividend price run-up, does provide a basis for questioning whether the trading observed reflects the valuation of a representative investor.

> Most empirical ex-dividend studies do not rely on a particular arbitrage model of equilibrium to determine the value of imputation tax credits. The estimates they generate are a matter of empirics and whether such studies capture the valuation of a representative investor is an open question. In this context it is worth noting that not only are there abnormal trades arising from ex-dividend arbitrage, but also that trading by long term investors is abnormal about the ex-dividend date.

From a wider review of the literature, there is evidence to suggest that around the ex-dividend and cum-dividend dates:

- There are unusual trading volumes[674]

- Investors trading during this period have an atypical mix of preferences, which are strongly represented in the price movements.[675] This is an example of 'the clientele effect'.

This is a problem because all dividend drop-off data comes from two trading days per dividend event, trading days subject to abnormal trading circumstances. This is different to all other market based equity evidence (such as used for equity beta, MRP) which draws on trading throughout the year. By largely reflecting the abnormal trading conditions on the two relevant trading days, dividend drop off studies may not identify the market value for the representative investor in other circumstances.

Further, McKenzie and Partington identify that if short term traders are highly involved in trading around the cum-dividend/ex-dividend dates, dividend drop off studies would underestimate the value of dividends and franking credits to those traders.[676] This is because transaction costs are relatively higher as a proportion of expected returns for short term traders. The estimated price drop off, including the dividend and imputation credit, is net of these relatively higher transaction costs. Therefore, this reduces the implied value of the imputation credit. Further, Frank and Jagannathan, studying traditional dividend drop off studies in classical tax environments without imputation, observe that:[677]

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[672] For example: E. Rantapuska, 'Ex-dividend day trading: who, how and why? Evidence from the Finnish market', *Journal of financial economics,* Vol. 88, Iss. 2, May 2008, pp. 355–374; R. Michaely and R. Murgia, The effect of tax heterogeneity on price and volume around the ex-dividend day: evidence from the Milan stock exchange, Review of financial studies, 1995, Vol. 8, No. 2, pp. 369–399; AB Ainsworth, KYL Fong, DR Gallagher and G Partington, 'Institutional trading around the ex-dividend day', *21st Australian Finance and Banking Conference*, March 2011.

[673] M McKenzie and G Partington, *Report to the AER—Response to questions related to the estimation and theory of theta*, March 2011, p. 8.

[674] D.E. Bellamy, *An analysis of ex-dividend abnormal trading volumes and share price changes in the Australian equity market, PhD thesis, School of Business*, The University of Queensland, 2002;

[675] For example: E. Rantapuska, 'Ex-dividend day trading: who, how and why? Evidence from the Finnish market', *Journal of financial economics,* Vol. 88, Iss. 2, May 2008, pp. 355–374; A.B. Ainsworth, K.Y.L. Fong, D.R. Gallagher and G. Partington, 'Institutional trading around the ex-dividend day', *21st Australasian finance and banking conference paper*, March 2011, p. 29; M. Frank and R. Jagannathan, 'Why do stock prices drop by less than the value of the dividend? Evidence from a country without taxes', *Journal of financial economics*, Vol. 47, No. 2, February 1998, pp. 161–188.

[676] M McKenzie and G Partington, *Report to the AER—Response to questions related to the estimation and theory of theta*, March 2011, p. 11.

[677] M. Frank and R. Jagannathan, 'Why do stock prices drop by less than the value of the dividend? Evidence from a country without taxes', *Journal of financial economics*, Vol. 47, No. 2, February 1998, p. 163.

> …it is not clear how we should interpret the observed empirical relation between ex-day price drop and the amount of the dividend. All that one can safely conclude, as Michaely (1991) does, is that any change in the relative pricing of dividends and capital gains one observes in the data can be observed as evidence of changing importance of the different trading groups. The consensus opinion seems to be that it is hard to interpret the relation between ex-day price drop and the amount of dividend in the presence of heterogeneous investors who face different transactions costs as well as taxes.

While this does not refer specifically to the challenge of identifying the value of imputation credits, it highlights a more general problem with the dividend drop off methodology. That is, the drop-off in market price between the cum-dividend and ex-dividend days is strongly influenced by the mix of investors trading at that specific point in time.

## The allocation problem

Dividend drop off studies only 'directly' identify the combined value of dividends and the attached imputation credit. This results in an estimate of the dividend drop off ratio. The market value of a franked dividend on the ex-dividend date consists of a package that embeds the dividend, the franking credit, income taxes, capital gains taxes, discounting for the effect of time, and possibly some transactions costs. In order to determine an estimate of the utilisation rate, this combined value of dividends and attached imputation credits must be allocated between the two components. This is called 'the allocation problem' and is a critical issue with dividend drop off studies. As identified by Cannavan, Finn and Gray, 'it is unlikely that the traditional ex-dividend day drop-off methodology will be able to separately identify the value of cash dividends and imputation credits'.[678]

Resolving this issue requires some assumptions. For example some studies have simply assumed full valuation of the cash component of the dividend, with the franking credit valued by difference.[679] This effectively assigns all embedded taxes, transaction cost and time value of money effects to the franking credit and none to the cash component.

By estimating separate market values for dividends and franking credits, the choice of a regression model is one possible solution to the allocation problem. To reliably separate these components generally requires observations with different franking levels.[680] However, this kind of variation in franking levels is limited. Nearly all dividends are either unfranked or fully franked.

The process of separating the combined package of dividends and franking credits by regression the uses the ratio of franking credit to the cash dividend to explain price changes due to the loss of the combined package are explained by. The ratio of the franking credit to the cash dividend refers to whether a dividend is fully, franked, unfranked or partially franked. This type of regression is most effective if there is a lot of variation in the franking proportion. However, this is not the case. Table K.13, below, sets out the proportions of dividend event types in SIRCA data (used in all major dividend drop off studies) for companies and trusts in a sample from 1 July 2000 to 28 February 2010.[681] The table shows that for the total sample (companies and trusts) approximately 75 per cent of the dividends have the same franking proportion, with only 25 per cent of observations varying.

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[678]    D. Cannavan, F. Finn and S. Gray, 'The value of dividend imputation tax credits in Australia', *Journal of financial economics*, Vol. 73, 2004, p. 175.

[679]    For example,

[680]    Intuitively, if there is very little variation in franking levels, the effects of different franking levels on price drop offs are more difficult to estimate precisely.

[681]    In compiling this sample, we filtered the SIRCA data-set to remove observations commonly filtered from other dividend drop off studies. In addition, we have also filtered out observations classified as stapled, observations without a positive trading volume, and observations where a price-sensitive announcement has occurred on either the cum-dividend day or the ex-dividend day.

**Table K.13  Proportions of dividend event types from 1 July 2000 to 28 February 2010**

| Dividend event type | Total sample | Trusts | Companies |
|---|---|---|---|
| Fully franked | 4598 (75 per cent) | 6 (1 per cent) | 4592 (84 per cent) |
| Partially franked | 428 (7 per cent) | 32 (5 per cent) | 396 (7 per cent) |
| Unfranked | 1143 (18 per cent) | 645 (94 per cent) | 498 (9 per cent) |
| Total | 6169 (100 per cent) | 683 (100 per cent) | 5486 (100 per cent) |

Source:     AER/ACCC analysis

An additional problem arises because the partially franked credits within the sample are largely trusts, and the nature of trust distributions is complex.[682] While many dividend payments from companies consist simply of a cash component and a franking credit component, trust distributions can include these and many other payment components.[683] Examples include return of capital, recorded capital gains, attributed foreign income and foreign source income. Different trust payment components can be taxable, tax exempt, tax free, tax deferred or CGT concession amounts.[684] The extra payment types and their range of tax treatments increase the possibility for error in the classification and recording of trust distribution events. Errors in either the recorded value of the cash component of the distribution or in its tax status may affect the implied value of the imputation credit, and its interpretation. We will undertake further analysis for the final guideline to explore the extent of this issue. However, if we were to remove trusts from the sample as a precautionary measure, we note that the proportion of fully franked dividends would be expected to rise as indicated by Table K.13. This would further reduce our ability to reliably separate the value of imputation credits from dividends.

## Other econometric issues

There are a number of other well documented econometric problems with dividend drop off studies. McKenzie and Partington set out an extensive assessment of these issues, including but not limited to:[685]

- They are based on trading prices on two separate days—during this time period, the magnitude of market changes unrelated to dividends can swamp the price drop cause by the dividend and imputation credit. Some studies use a basic market correction factor to account for this, but the effectiveness of this adjustment depends on all sectors responding equally to the same systematic market changes. We consider this is unlikely in practice, because different sectors have different exposure to drivers of market changes. The effect of this adjustment can be significant. The ERA study found that the market correction reduced the average theta estimates under various model specifications from 0.45 to 0.34.[686]

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[682]   ATO, *Adjusting your cost base and reduced cost base*, Available at: http://www.ato.gov.au/Individuals/Ind/Non-assessable-capital-payments-from-a-trust/?page=4#Adjusting_your_cost_base_and_reduced_cost_base

[683]   ATO, *Capital gains made by trusts*, Available at: http://www.ato.gov.au/General/Capital-gains-tax/In-detail/Trusts/Capital-gains-made-by-trusts/

[684]   ATO, *Capital gains tax: Your distribution statement*, Available at: http://www.ato.gov.au/General/Capital-gains-tax/In-detail/Trusts/Non-assessable-capital-payments-from-a-trust/?default=&page=2#Your_distribution_statement

[685]   M. McKenzie and G. Partington on behalf of the Securities Industry Research Centre of Asia Pacific (SIRCA) Pty Ltd, *Report to the AER—Evidence and submissions on gamma*, March 2010.

[686]   Economic Regulation Authority, Explanatory statement for the draft rate of return guidelines: Meeting the requirements of the National Gas Rules, August 2013, pp. 201–205.

- Bid-ask bounce—where either a dividend is small, or the difference between bid and ask prices on a share is large, movements in price can simply reflect a 'bounce' between bid and ask (or ask and bid). The bid price is the submitted market price for investors seeking to purchase a share. The ask price is the submitted market price at which investors holding the share are willing to sell. The 'bounce' between these two points can swamp the measured effect of the imputation credit. McKenzie and Partington note that this error is likely to have affected both the Beggs and Skeels and SFG studies.[687]

- The complete effects of a market event such as the distribution of dividends can take more than one day to be completely embodied in the trading price—this means that even if the market correction described above is effective, the ex-dividend price may not fully incorporate the value of the imputation credit or the dividend.

- Dividend drop off studies are highly sensitive to the input data—for example, in the ERA dividend drop off study, the ERA observed that 'the presence of a relatively small percentage of observations can heavily influence the estimate of theta'.[688] This is a problem because most dividend drop off studies include some form of filtering (such as data exclusion or partitioning) or adjustments (such as robust regression methods) to deal with other problems in the data. Due to the sensitivity of the results to the input data, these methodological choices have a significant impact on the implied market value of imputation credits.[689] The ERA goes on to conclude that '[a]s a result of this study, the Authority considers that any estimate of theta is essentially a function of the most influential observations due to the extreme multicolinearity present in the data'.[690]

- Large numbers of 'zero-drop off' observations, where prices do not change between the cum-dividend and ex-dividend day—this is likely to reflect thin or no trading in a particular stock

- Estimates in dividend drop off studies have very high standard errors. This does not by itself mean that the estimates are uninformative, but it does demonstrate imprecision.

## K.6.2 Alternative market value studies

Besides dividend drop off studies, there are alternative market based implied valuation approaches to estimating the utilisation rate. Generally, these studies are based on similar arbitrage principles to dividend drop off studies. This means that they compare two security prices where one security includes the entitlement and one security excludes the entitlement and assume the market valuation of the entitlement is reflected in the difference. However, they are designed to avoid the other influences in the data that affects traditional dividend drop off analysis. In particular, the studies typically use simultaneous price differentials that make them less affected by general market movements. That is, the differentials should more accurately reflect the implied market value of the specific dividend event. Some examples of alternative market based valuation approaches are:

- simultaneous trading of shares with and without entitlements

- simultaneous trading of derivatives and futures and of their underlying shares

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[687] M. McKenzie and G. Partington on behalf of the Securities Industry Research Centre of Asia Pacific (SIRCA) Pty Ltd, *Report to the AER—Evidence and submissions on gamma*, March 2010, p. 19;
[688] Economic Regulation Authority, Explanatory statement for the draft rate of return guidelines: Meeting the requirements of the National Gas Rules, August 2013, pp. 205.
[689] M. McKenzie and G. Partington on behalf of the Securities Industry Research Centre of Asia Pacific (SIRCA) Pty Ltd, *Report to the AER—Evidence and submissions on gamma*, March 2010, p. 45
[690] Economic Regulation Authority, Explanatory statement for the draft rate of return guidelines: Meeting the requirements of the National Gas Rules, August 2013, pp. 205.

▪ hybrid securities.

Table K.14 sets out a range of available alternative market value studies.

**Table K.14    Alternative market value studies**

| Study | Estimated value/range of the utilisation rate | Comments |
|---|---|---|
| Walker and Partington (1999)[691] | 0.88 – 0.96 | Based on matched pairs of trades separated by no more than one minute from January 1995 to March 1997. This included 93 ex-dividend events for 50 securities. |
| Chu and Partington (2001)[692] | 1.5 combined drop off | This study did not include a specific estimate of the utilisation rate. However, even if we assumed dividends were fully valued (1.0), this suggests that investors fully value imputation credits.[693] |
| Cannavan, Finn and Gray (2004)[694] | 0 – 0.15 | Sample finds dividends are fully valued, which is inconsistent with much of the available evidence. |
| Chu and Partington (2008)[695] | 1.29 combined drop off | Based on a specific trading instance for a single listed entity. This study did not include a specific estimate of theta. However, even if we assumed dividends were fully valued (1.0), this suggests a utilisation rate of approximately 0.68. |
| Cummings and Frino (2008)[696] | 0.52 | The authors extend the method used in Cannavan, Finn and Gray and find a significantly higher estimate of the utilisation rate. The authors attribute this to the more recent sample period including the reduction in capital gains tax and law change to allow for cash refunds of excess franking credits. |
| Feuerherdt, Gray and Hall (2010)[697] | 1.00 combined drop off | The authors assume dividends are fully valued, and therefore find that theta is 0. |

Source:    As specified in table.

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[691]    S. Walker and G. Partington, 'The value of dividends: Evidence from cum-dividend trading in the ex-dividend period', *Accounting and Finance*, Vol. 39, Iss. 3, November 1999, pp. 293–294.

[692]    H. Chu and G. Partington, 'The value of dividends: evidence from a new method', *Paper presented at the Accounting Association of Australia and New Zealand Annual Conference, Wellington,* 2001.

[693]    The dividend drop off ratio is the drop in price as a proportion of the face value of the dividend. The maximum face value of attached imputation credits that can be embodied in this ratio is limited to the total value of Australian corporate tax paid. For example, suppose a company earns $100 in pre-tax operating profit and is subject to the Australian standard corporate tax rate of 30 per cent. The company will therefore pay $30 in tax, which it can distribute as franking credits. Further, its maximum dividend payout is $70 (100-30). So, if it pays out all of its post-tax profit as dividends and fully franks its imputation credits, fully valued imputation credits would be approximately 43 per cent (30/70) of the face value of the dividends. Therefore, a dividend drop off ratio of 1.43 or higher suggests that investors fully value both dividends and franking credits.

[694]    D. Cannavan, F. Finn, S. Gray, The value of dividends: Evidence from cum-dividend trading in the ex-dividend period, *Accounting and finance*, Vol. 39, pp. 275–296.

[695]    H. Chu and G. Partington, 'The market valuation of cash dividends: The case of the CRA bonus issue, *International review of finance*, Vol. 8, Iss. 2, June 2008, p. 19.

[696]    Cummings and Frino, 'Tax effects on the pricing of Australian stock index futures', *Australian Journal of Management*, Vol. 33, No. 2, December 2008, pp. 391–406.

[697]    Feuerherdt, S. Gray and Hall, 'The value of imputation tax credits on Australian hybrid securities', *International review of finance,* Vol. 10, No. 3, pp. 365-401.

In general, these studies address the problem of market movements swamping the dividend drop off but are still subject to the other problems with dividend drop off studies. In all cases these approaches still estimate the combined package of dividends and imputation credits. This is because outside of redemption, imputation credits are never separate from dividends. So, there is never a circumstance outside of redemption in which imputation credits are separately observable. As a result, these estimates are still subject to the allocation problem. Due to the infrequency of partially franked credits, many of these studies are also subject to concerns about lack of variability in the regressors that are used to allocate these values. Further, in many cases they are:

- Studies of uncommon market circumstances where shares with and without entitlements are simultaneously available.[698] The rareness of these circumstances means that the results are usually based on small samples of data. These small samples could exaggerate issues such as sensitivity to inputs and the clientele effect because they are from an even narrower set of observations and companies.

- Based on an assumption that dividends are fully valued.[699] This is inconsistent with the majority of available evidence and lowers the implied estimate of the utilisation rate. Further, the Tribunal recently referred to this assumption as 'a somewhat arbitrary procedure'.[700]

In total, experts have identified both advantages and disadvantages of alternative implied market value studies in comparison to dividend drop off studies. We consider that the alternative implied market value studies are part of the range of credible expert estimates of the implied market value. As a result, we consider it would be good regulatory practice to consider the studies as a range of evidence with regard to its strengths and weaknesses.

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[698] Such as: H. Chu and G. Partington, 'The market valuation of cash dividends: The case of the CRA bonus issue, *International review of finance*, Vol. 8, Iss. 2, June 2008, p. 19.

[699] Such as: D. Cannavan, F. Finn, S. Gray, 'The value of dividends: Evidence from cum-dividend trading in the ex-dividend period', *Accounting and finance*, Vol. 39, pp. 275–296.

[700] Australian Competition Tribunal, *Application by DBNGP (WA) Transmission Pty Ltd (No 3) [2012] ACompT 14*, July 2012, Para 202.